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Acknowledgment

Agradecimiento

I take advantage of this first editorial of the year to inform you that the physical volumes of the journal *Cirujano General*, from 1980 to 1999, have already been digitized almost in their entirety. Shortly, we will list the missing issues, in case any of you have them, in order to complete the digital collection.

At the same time, I reaffirm my own commitment to continue increasing the quality and dissemination of our publication. By having our articles translated into English, we will be able to achieve greater visibility, as well as being in international indexes.

Likewise, we are working on the online submission platform EditorWeb©, for the reception and submission of manuscripts for the *Cirujano General* journal.

With the COVID-19 pandemic, difficult but necessary decisions have had to be made, such as postponing face-to-face events. Our President is making a huge effort to achieve surgical education learning at the distance. This is a good time for you, during the contingency, to finish your pending manuscripts and submit them.

Once again: thank you very much and congratulations to those who made possible the continuity of this project.

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ORIGINAL ARTICLE

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Factors conditioning severity of grade I vs. grade II cholecystitis in adult women

Factores que condicionan severidad de colecistitis grado I vs. grado II en mujeres adultas

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Keywords:
Cholecystitis, cholecystectomy, gallstones, women.

Palabras clave:
Colecistitis, lecistectomía, cálculos biliares, mujeres.

ABSTRACT

Introduction: Cholelithiasis is a public health problem in Mexico. Obesity is considered a risk factor for the development of this disease; however, its role in influencing the severity of cholecystitis is not well defined. **Objective:** To evaluate the factors that condition the severity of cholecystitis (grade I vs. grade II, according to the Tokyo 18 guidelines) in women in a public hospital in Ciudad Juarez, Mexico. **Material and methods:** Cross-sectional study in women with grade I and II cholecystitis who underwent laparoscopic cholecystectomy. The following parameters were assessed and compared: age, weight, height, body mass index (BMI), waist, hip, waist-to-hip ratio (WHR), blood pressure, glucose, cholesterol, high-density lipoprotein-cholesterol (HDL), triglyceride levels, white blood cell count, neutrophil count, surgical time, and presence of type 2 diabetes (DM2), high blood pressure (HBP), hypertriglyceridemia, hypercholesterolemia, dyslipidemia, abdominal obesity, WHR obesity, and metabolic syndrome (MS). **Results:** 132 patients were included in this study and only statistically and clinically significant differences were observed in the mean triglyceride levels (155.9 vs. 178.4; p = 0.008), and in the presence of hypertriglyceridemia (40.5% vs. 70.8%; p = 0.001). **Conclusions:** Obesity measured by BMI, waist and/or WHR do not seem to be related to the degree of severity of cholecystitis (grade I vs. grade II), while mean triglyceride levels and the presence of hypertriglyceridemia may act as aggravating factors in acute grade II cholecystitis.

RESUMEN

Introducción: *La colelitiasis es un problema de salud pública en México. La obesidad se considera un factor de riesgo de la génesis de esta enfermedad; sin embargo, no está bien definido su papel con respecto a la influencia en la severidad del cuadro de colecistitis.* ***Objetivo:*** *Evaluar los factores que condicionan la severidad en un cuadro de colecistitis (grado I vs. grado II, según las guías de Tokio 18) en mujeres en un hospital público en Ciudad Juárez.* ***Material y métodos:*** *Estudio transversal en mujeres con colecistitis grado I y II sometidas a colecistectomía laparoscópica. Se evaluaron y compararon las siguientes variables: edad, peso, talla, índice de masa corporal (IMC), cintura, cadera, índice cintura/cadera (ICC), tensión arterial, glucosa, colesterol, lipoproteínas de alta densidad (HDL), triglicéridos, leucocitos, neutrófilos, tiempo quirúrgico, presencia de diabetes tipo 2 (DM2), hipertensión arterial (HTA), hipertrigliceridemia, hipercolesterolemia, dislipidemia, obesidad abdominal, obesidad por ICC y síndrome metabólico (SM).* ***Resultados:*** *Se estudiaron 132 pacientes, sólo se observó diferencia estadísticamente significativa y significancia clínica en el promedio de triglicéridos (155.9 vs. 178.4; p = 0.008), y en la presencia de hipertrigliceridemia (40.5% vs. 70.8%; p = 0.001).* ***Conclusiones:*** *La obesidad medida por el IMC, cintura y/o ICC no parecen tener relación con el grado de severidad de la colecistitis (grado I vs. grado II), mientras que el promedio de triglicéridos y la presencia de hipertrigliceridemia sí pueden actuar como factores agravantes de la colecistitis aguda grado II.*

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INTRODUCTION

Nowadays, cholelithiasis is a public health problem.[1] Necropsy studies reveal that 12% of men and 24% of women suffer from this entity.[2] Although 80% of patients with cholelithiasis may remain asymptomatic, the rest present with symptoms such as biliary colic, and complications such as cholecystitis, choledocholithiasis, pancreatitis, and cholangitis, among others.[2]

The risk factors for cholelithiasis and cholecystitis are well defined. While obesity is classically considered as an etiologic factor, central obesity, and waist-to-hip ratio (WHR) are suggested to play an important role in the severity of cholecystitis.[3]

The aim of this study is to evaluate which factors may condition the occurrence of grade II cholecystitis in a female population undergoing laparoscopic cholecystectomy.

MATERIAL AND METHODS

From January through December 2018 a cross-sectional study was performed at the General Hospital de Zona No. 35 of the Mexican Social Security Institute (HGZ No. 35, IMSS) in Ciudad Juarez, Mexico. Female patients aged 18 to 65 years, admitted to hospital with a diagnosis of acute cholecystitis and who underwent laparoscopic cholecystectomy were included.

Patients with liver diseases such as cirrhosis, cysts or liver tumors of any etiology, cancer of the rest of the digestive tract, pregnancy, and patients whose cholecystectomy had been converted from laparoscopic to open cholecystectomy were excluded.

The patients were divided into two groups: group 1 included patients with acute cholecystitis without any other complication or grade I cholecystitis, and group 2 included patients with complicated acute cholecystitis (choledocholithiasis, cholangitis, biliary pancreatitis, mucocele, empyema, etc.) without any organic dysfunction or grade II. The diagnosis of acute cholecystitis, as well as the differentiation between grade I and grade II acute cholecystitis, was determined based on the operative findings and the criteria of the Tokyo 18 guidelines *(Tables 1 and 2)*.[4]

Laparoscopic cholecystectomy was performed as a treatment for acute cholecystitis. The operation was performed by the same surgical team using the standard four-port technique.[5] The procedure was performed during the same hospitalization period.

Following parameters were measured: age, weight, height, body mass index (BMI), waist, hip, waist-to-hip ratio (WHR), blood pressure, glucose, cholesterol, high-density lipoprotein-cholesterol (HDL-C), triglycerides, white blood cells, neutrophils, surgical time, and presence of type-2 diabetes (DM2), high blood pressure (HBP), hypertriglyceridemia (≥ 150 mg/dl), hypercholesterolemia (≥ 200 mg/dl), dyslipidemia (altered cholesterol and/or triglycerides), abdominal obesity (hip 88 cm), waist-to-hip ratio (WHR) obesity (≥ 0. 85), and metabolic syndrome (MS).

Weight and height were measured with the patient barefoot and wearing a hospital gown, BMI was calculated by dividing weight (kg) by height squared (meters). Waist and hip circumference were measured with a flexible tape measure with the patient in fasting state,

Table 1: Diagnostic criteria for acute cholecystitis according to the Tokyo 18 guidelines.

A. Local signs of inflammation
1. Murphy's sign
2. Pain/mass/tenderness in URQ
B. Signs of systemic inflammation
1. Fever
2. CPR increased
3. White blood cell counts increased
C. Image study findings
Characteristic findings of acute cholecystitis*
Diagnostic suspicion:
one element of A + one element of B
Definitive diagnosis:
one element of A + one element of B + C

URQ = upper right quadrant; CPR = C-reactive protein.
* Imaging findings: thickening of the vesicular wall, peri-vesicular fluid, positive Murphy's sonographic sign.

Table 2: Severity criteria for acute cholecystitis according to the Tokyo 18 guidelines.

Grade III (severe)
Acute cholecystitis associated with dysfunction of any of the following organs/systems:
1. Cardiovascular dysfunction: hypotension requiring treatment with dopamine ≥ 5 μg/kg per minute or epinephrine at any dose
2. Neurological dysfunction: alteration of consciousness
3. Respiratory dysfunction: PaO_2/FiO_2 ratio < 300
4. Renal dysfunction: oliguria, creatinine > 2.0 mg/dl
5. Hepatic dysfunction: PT-INR > 1.5
6. Hematologic dysfunction: platelet count < 100,000/mm^3

Grade II (moderate)
Acute cholecystitis associated with any of the following conditions:
1. Leukocytosis > 18,000/mm^3
2. Palpable mass in the right upper quadrant
3. Duration of symptoms > 72 h
4. Marked local inflammation (gangrene, peri-vesicular or hepatic abscess, emphysema, empyema, mucocele, etc.)

Grade I (mild)
Acute cholecystitis that does not meet criteria for grade III or II. It can also be defined as acute cholecystitis in a previously healthy patient, without organ dysfunction or moderate inflammatory changes in the gallbladder, and whose cholecystectomy is performed safely and with low operative risk

PT = prothrombin time, INR = International Normalized Ratio.

always in the standing position, and the tape placed at the level of the navel for the waist and at the level of the most prominent gluteal part for the hip.

Since no experimental intervention was performed, this study did not require approval by the institutional bioethics committee if the patients' informed consent for the surgical procedure was already obtained.

Statistical analyses of the parameters were performed with the SPSS program (version 23.0; Chicago, Il). Qualitative variables were compared with the χ^2 test, and quantitative variables with Student's t test (normal behavior variables) and the Mann-Whitney U test (abnormal behavior variables). A p value < 0.05 was considered statistically significant.

RESULTS

We evaluated 132 patients who met the inclusion criteria, with a mean age of 38.6 years, a mean BMI 31.8 kg/m^2, and a mean triglyceride level of 164 mg/dl; the rest of the parameter values are shown in *Table 3*.

Table 3: Numerical characteristics of the total number of patients studied.

Parameter	Mean ± SD	Minimum	Maximum
Age (years)	38.6 ± 10.6	20	69
Weight (kg)	77.4 ± 15.4	45	115
Height (cm)	156.0 ± 6.2	140	173
BMI (kg/m^2)	31.8 ± 6.1	18.7	48.5
Waist (cm)	101.1 ± 13.7	67	130
Hip (cm)	110.7 ± 12.3	80	145
WHR	0.9 ± 0.1	0.72	1.09
Systolic blood pressure (mmHg)	118.6 ± 17.2	90	180
Diastolic blood pressure (mmHg)	74.7 ± 11.8	50	110
Glucose (mg/dl)	104.2 ± 32.6	70	344
Cholesterol (mg/dl)	186.8 ± 48.4	84	407
HDL-cholesterol (mg/dl)	40.7 ± 9.8	22	67
Triglycerides (mg/dl)	164.1 ± 75.5	47	505
White blood cells (× 10^9/l)	10.4 ± 10.1	4	18
Neutrophile count (%)	67.3 ± 13.6	39	97
Surgical time (minutes)	64.5 ± 27.3	30	200

SD = standard deviation; BMI = body mass index; WHR = waist-to-hip ratio; HDL-cholesterol = high-density lipoprotein cholesterol.
Source: archive of the HGZ No. 35, IMSS.

Table 4: Comorbidities in the total number of patients.

Parameter	Total of patients (N = 132) n	%
DM2		
No	80	60.6
Yes	52	39.4
HBP		
No	120	90.9
Yes	12	9.1
Hipertriglyceridemia		
No	64	48.5
Yes	68	51.5
Hypercholesterolemia		
No	89	67.4
Yes	43	32.6
Dyslipidemia		
No	52	39.4
Yes	80	60.6
BMI		
Normal weight	18	13.6
Overweight	32	24.2
Obesity	82	62.1
Abdominal obesity		
No	23	17.4
Yes	109	82.6
WHR obesity		
No	23	17.4
Yes	109	82.6
MS		
No	59	44.7
Yes	73	55.3

DM2 = type 2 diabetes mellitus; HBP = high blood pressure; BMI = body mass index; WHR = waist-to-hip ratio; MS = metabolic syndrome.
Source: archive of the HGZ No. 35, IMSS.

Regarding the comorbidities presented in the total number of patients, we found a prevalence of DM2 of 39.4%, HBP of 9.1%, hypertriglyceridemia of 51.5%, among others. The remaining percentages are described in *Table 4*.

Quantitative variables were compared by groups (grade I vs. grade II) and statistically significant differences were observed in the mean triglyceride levels, and in white blood cell and neutrophil counts. The rest of the values that were not statistically significant are shown in *Table 5*.

Regarding comorbidities between the groups, a statistically significant difference was seen in the presence of hypertriglyceridemia and dyslipidemia. The rest of the comorbidities that were not statistically significant are detailed in *Table 6*.

DISCUSSION

Acute cholecystitis is the most common complication of cholelithiasis, with a mortality of approximately 3%. The standard treatment is laparoscopic cholecystectomy;[6] however, open cholecystectomy continues to be performed in some second level care centers.[7]

Overweight and obesity increase the risk of cholelithiasis[8] through the increased secretion of cholesterol in the liver, which produces supersaturation and precipitation of bile with the consequent formation of calculi. The role of obesity in the development of gallstones is clear, but its role is debatable with respect to its severity. The presence of obesity in the context of cholelithiasis implies a chronic visceral inflammatory state that could influence the severity of acute cholecystitis. However, in this study the means between groups (grade I vs. grade II) were not statistically significant in relation to BMI, waist, hip, and WHR. This could suggest that, although obesity predisposes to a visceral inflammatory state at the onset of the disease, once cholecystitis is established, obesity per se does not seem to influence the severity of the condition.

Although the relationship between serum total cholesterol levels and the frequency of cholelithiasis has not been demonstrated, we were able to observe that both the mean triglyceride levels (155.9 vs. 178.4 mg/dl; p = 0.008) and the presence of hypertriglyceridemia (40.5% vs. 70.8% mg/dl; p = 0.001) were correlated with group 2 (grade II cholecystitis). Alterations in lipid metabolism are a pivotal element in the development of cholelithiasis in patients with obesity. This duality is characterized

Table 5: Numerical characteristics of the studied groups.

Parameter	Group 1 (n = 84) Mean ± SD	Group 2 (n = 48) Mean ± SD	p value
Age (years)	39.1 ± 10.3	37.7 ± 11.0	0.48*
Weight (kg)	77.2 ± 16.6	77.6 ± 13.1	0.88*
Height (cm)	156.3 ± 6.3	155.4 ± 6.2	0.42*
BMI (kg/m^2)	31.6 ± 6.6	32.1 ± 5.2	0.61*
Waist (cm)	100 ± 13.7	103.1 ± 13.7	0.21*
HIP (cm)	110.1 ± 13.0	111.7 ± 11.0	0.48*
WHR	0.9 ± 0.1	0.9 ± 0.1	0.23*
Systolic blood pressure (mmHg)	118.8 ± 17.8	118.3 ± 16.1	0.87*
Diastolic blood pressure (mmHg)	75.1 ± 11.9	74 ± 11.7	0.61*
Glucose (mg/dl)	101.8 ± 24.6	108.3 ± 43.1	0.26*
Cholesterol (mg/dl)	183.2 ± 48.9	193.1 ± 47.3	0.26*
HDL-cholesterol (mg/dl)	41.8 ± 9.8	38.6 ± 9.7	0.06**
Triglycerides (mg/dl)	155.9 ± 81.6	178.4 ± 61.6	0.008**
White blood cells (× 10^9/l)	9.7 ± 12.2	11.6 ± 4.3	< 0.01**
Neutrophils (%)	63.1 ± 12.6	74.8 ± 12.0	< 0.01*
Surgical time (minutes)	61.4 ± 20.2	69.9 ± 36.1	0.14*

* Student-t test; ** Mann-Whitney U test.
SD = standard deviation; BMI = body mass index; WHR = waist-to-hip ratio; HDL-cholesterol = high density lipoprotein cholesterol.
Source: Archive of the HGZ No. 35, IMSS.

by hypertriglyceridemia that correlates with lack of gallbladder motility[9] being therefore a factor in the development of cholelithiasis. The results of this study suggest that elevated triglyceride levels do significantly increase the risk of severity (at least to grade II), which would condition both an aggravation of the disease and act as a risk factor for severity.

Other studies have suggested that obesity may be a protective factor against the severity of cholelithiasis in male patients, and that visceral fat may have a protective function against the inflammatory state in cholecystitis.[8] These same results have not been reproduced in other studies.[10,11] Cholelithiasis has a direct relationship with non-alcoholic grade liver,[12] and fatty infiltration in visceral organs such as the liver can cause chronic inflammation, so the assumption that visceral fat conditions protection could be contradictory.[13]

DM2 and HBP are considered risk factors for developing acute cholecystitis.[14] Fagan et al. demonstrated that DM2 did influence the development of gangrenous cholecystitis.[15] However, our results suggest that both DM2 and HBP appear not to influence the development of complications. This has been a subject to discussion and larger studies are required to corroborate the true role of these comorbidities in the severity of cholecystitis.

CONCLUSION

In the present study, the results suggest that high triglyceride levels could act as a risk factor for grade II cholecystitis. No relationship was demonstrated between obesity measured by BMI, waist, hip and/or WHR with the severity of cholecystitis (grade I vs. grade II). However, more prospective, or multicenter studies are needed to corroborate these findings.

Table 6: Comorbidities of study patients.

Parameter	Group 1 (n = 84) n	Group 1 (n = 84) %	Group 2 (n = 48) n	Group 2 (n = 48) %	p*
DM2					
No	50	59.5	30	62.5	0.73
Yes	34	40.5	18	37.5	
HBP					
No	77	91.7	43	89.6	0.68
Yes	7	8.3	5	10.4	
Hypertriglyceridemia					
No	50	59.5	14	29.2	0.001
Yes	34	40.5	34	70.8	
Hypercholesterolemia					
No	57	67.9	32	66.7	0.88
Yes	27	32.1	16	33.3	
HDL-cholesterol (< 50 mg/dl)					
No	19	22.6	7	14.6	0.26
Yes	65	77.4	41	85.4	
Dyslipidemia					
No	41	48.8	11	22.9	0.003
Yes	43	51.2	37	77.1	
BMI					
Normal weight	14	16.7	4	8.3	0.24
Overweight	22	26.2	10	20.8	
Obesity	48	57.1	34	70.8	
BMI					
< 30	34	40.5	14	29.2	0.19
≥ 30	50	59.5	34	70.8	
Abdominal obesity					
No	15	17.9	8	16.7	0.86
Yes	69	82.1	40	83.3	
WHR obesity					
No	17	20.2	6	12.5	0.26
Yes	67	79.8	42	87.5	
MS					
No	42	50.0	17	35.4	0.1
Yes	42	50.0	31	64.6	

* χ^2.
DM2 = type-2 diabetes mellitus; HBP = high blood pressure; HDL-cholesterol = high-density lipoprotein-cholesterol; BMI = body mass index; WHR = waist-to-hip ratio; MS = metabolic syndrome.
Source: archive of the HGZ No. 35, IMSS.

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ORIGINAL ARTICLE

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Inter-sphincteric ligation of fistulous tract as treatment of complex anorectal fistula

Ligadura interesfintérica de trayecto fistuloso como tratamiento de fístula anorrectal compleja

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Keywords:
Anal fistula, complex anal fistula, high trans-sphincteric fistula, ligation of inter-sphincteric fistula tract, fecal incontinence.

Palabras clave:
Fístula anal, fístula anal compleja, fístula transesfintérica alta, ligadura interesfintérica del trayecto fistuloso, incontinencia fecal.

ABSTRACT

Objective: To demonstrate that one of the effective treatments for the resolution of complex high trans-sphincteric anal fistulas is the technique of ligation of the inter-sphincteric tract, since it is one of the procedures that has shown adequate results for the resolution of the fistula, as well as for preserving both the anal sphincter and anal continence. **Material and methods:** We conducted a prospective and observational study of patients who underwent surgery with the technique of ligation of the inter-sphincteric tract for complex anal fistula (high trans-sphincteric), of cryptoglandular origin during the period from January 2016 to August 2018 in the Coloproctology Service of the General Hospital of Mexico "Dr. Eduardo Liceaga" in Mexico City, Mexico. Clinical features, surgical technique and outcome were analyzed. **Results:** A total of 23 patients with high trans-sphincteric fistula were included and underwent ligation of the inter-sphincteric tract. Only one patient presented recurrence of the fistula. In the postoperative follow-up, one month after surgery, three patients presented perianal abscess at the incision site (13.04%). No patient presented fecal incontinence after the surgical procedure. The median Wexner score was 0. **Conclusion:** In our experience, the technique of ligation of the inter-sphincteric tract was a safe, reproducible surgery, with low morbidity and no fecal incontinence, with a success rate of around 90%, so it could be considered the first line of surgical treatment in high trans-sphincteric complex anal fistulas.

RESUMEN

Objetivo: *Demostrar que uno de los tratamientos efectivos para la resolución de fístulas anales complejas transesfintéricas altas es la técnica de ligadura del trayecto interesfintérico, ya que es uno de los procedimientos que ha demostrado adecuados resultados para la resolución de la fístula, así como la preservación del esfínter anal y la continencia.* ***Material y métodos:*** *Se realizó un estudio prospectivo y observacional de pacientes intervenidos quirúrgicamente con la técnica de ligadura del trayecto interesfintérico por fístula anal compleja (transesfintérica alta), de origen criptoglandular durante el periodo comprendido entre enero del 2016 y agosto del 2018 en el Servicio de Coloproctología del Hospital General de México "Dr. Eduardo Liceaga" de la Ciudad de México. Se analizaron las características clínicas, la técnica quirúrgica y su resultado.* ***Resultados:*** *Fueron incluidos un total de 23 pacientes con fístula transesfintérica alta, a los cuales se les realizó técnica de ligadura del trayecto interesfintérico. Sólo uno de los pacientes presentó recurrencia de la fístula. En el seguimiento postoperatorio, un mes después de la cirugía, tres pacientes presentaron absceso perianal en el sitio de la incisión (13.04%). Ningún paciente presentó incontinencia fecal posterior a procedimiento quirúrgico, la mediana del score de Wexner fue 0.* ***Conclusión:*** *En nuestra experiencia, la técnica de ligadura del trayecto interesfintérico resultó una cirugía segura, reproducible, con escasa morbilidad y nula incontinencia fecal, con un porcentaje de éxito alrededor de 90%, por lo que podría considerarse la primera línea de tratamiento quirúrgico en fístula anal compleja transesfintérica alta.*

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INTRODUCTION

After undergoing drainage of an anorectal abscess, approximately one-third of patients will develop an anal fistula, which is an abnormal connection between the anal canal and the perianal skin. Fistulas manifest with persistent or intermittent pain, swelling, and purulent drainage. The most common origin of these fistulas is a cryptoglandular infection.[1-3]

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Fistulas are classified as simple or complex, the latter including high trans-sphincteric tracts that involve more than 30% of the anal sphincter, supra-sphincteric fistulas, extra-sphincteric fistulas, recurrent fistulas, fistulas with multiple tracts, and all fistulas of anterior location in women, among others.[4-6]

The fundamental goals in the treatment of anal fistulas are to eradicate sepsis, close the fistulous tract, prevent recurrence and, most importantly, preserve anal continence.[7]

One of these anal sphincter-preserving techniques for the treatment of complex fistulas is the ligation of the inter-sphincteric tract (LIFT) technique, first described by Rojanasakul et al. in 2007, primarily for the treatment of high trans-sphincteric fistulas.[8-12]

These authors proposed closure of the primary (internal) orifice to prevent particles of fecal matter from entering the fistula tract and ligation of the inter-sphincteric tract, thus eliminating the septic focus. Contraindications to perform this technique include anorectal abscesses associated with the tract, active inflammatory bowel disease and fistulas related to malignancy. Multiple reports in the literature report a success rate ranging from 47-95%.[13-17]

Some authors consider that a drainage seton should be placed eight weeks prior to performing a LIFT technique, since they consider that this measure eliminates the septic focus and promotes fibrosis of the fistulous tract, facilitating later dissection of the inter-sphincteric space and ligation of the tract.[18-25]

The aim of this paper is to describe the experience of a same surgical team with the LIFT technique in high (complex) trans-sphincteric anal fistulas, and to describe the modifications we have made to this technique.

Table 1: Clinical features of the series patients.

Parameter	N = 23
Age (years)	23-70
Gender	
Male	20
Female	3
Smoking history	
Positive	1
Negative	22
Diabetes mellitus	
Positive	1
Negative	22
High blood pressure	
Positive	2
Negative	21
Obesity (BMI)	
> 25	7
< 25	16
Evolution time (months)	4-24
Previous surgery	
Yes	10
No	13
Previous seton	
Yes	9
No	14

BMI = body mass index.

Table 2: Fistula characteristics and surgical technique.

Parameter	N = 23
Fistula type	
High trans-sphincteric	23
Location	
Anterior	14
Posterior	9
LIFT technique	
Ligation only	23
Fistulous path	
< 3 cm	4
> 3 cm	19

MATERIAL AND METHODS

From January 2016 through August 2018, a prospective, observational, and longitudinal study of patients who underwent surgery with a LIFT technique for complex anal fistulas (high trans-sphincteric) of cryptoglandular origin in the Coloproctology Service of the General Hospital of Mexico "Dr. Eduardo Liceaga" in Mexico City, was performed by the same surgical team. The mean postoperative follow-up of the patients was 12 months. Patients with high

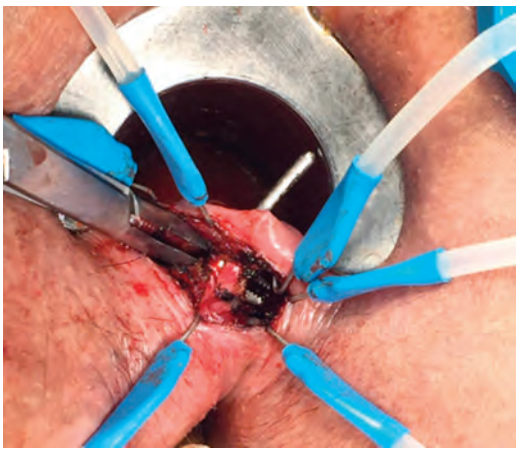

Figure 1: *Dissected fistulous tract.*

trans-sphincteric fistulas, clinically evidenced and confirmed by endoanal ultrasound were considered *(Tables 1 and 2)*.

Inclusion criteria were as follows: complex anal fistulas of cryptoglandular origin with high trans-sphincteric trajectory, with or without previous surgeries, with or without drainage seton placement, and with a single primary orifice. Antibiotic prophylaxis with metronidazole 500 mg in a single dose one hour prior to the surgical procedure was used in all patients. All patients underwent surgery with mixed anesthetic block and placed in the Sevillian knife position.

The fundamental steps of the procedure are: rectal examination and complete anoscopy procedure, identification, and canalization of the fistulous tract with a stylet, previous removal of the seton in the cases in which it was present, an incision of approximately 2 cm transversely in the inter-sphincteric space, and dissection until the fistulous tract is identified. The stylet is removed, and the fistulous tract is curetted, and two 2-0 Vicryl® trans-fixed stitches are placed at each end, the closest possible to the internal anal sphincter and the external anal sphincter *(Figure 1)*.

Both silk thread references are tied, and the fistulous tract is sectioned with a scalpel; 1 ml of hydrogen peroxide is injected through the secondary orifice, ensuring that there is no leakage into the inter-sphincteric space. In cases where leakage was present, a new ligation was performed with a Vicryl® 2-0 thread and checked again with hydrogen peroxide. The surgical wound was approached with simple stitches of Vicryl® 3-0, leaving enough space in the center of the wound to facilitate drainage *(Figure 2)*.

The original technique recommends the complete dissection of the fistulous tract. However, we consider that it is better not to thin the tract, as this prevents the tearing of the fistulous tract.

The postoperative period was managed with intravenous analgesics such as ketorolac 30 mg every 12 hours, paracetamol 500 mg every eight hours and antibiotics such as intravenous metronidazole 500 mg every eight hours, which was continued orally for 10 days. All patients were discharged from the hospital 24 hours after the surgical procedure. Postoperative evaluation was performed in the outpatient clinic at 10 days, 30 days, three months, six months and one year after the surgical procedure, and in some patients, up to 24 months later. Follow-up examination consisted only of clinical evaluation.

Healing was defined as closure of the wound and the secondary fistulous orifice, as well as the absence of symptoms. Continence was assessed using the Wexner scale.

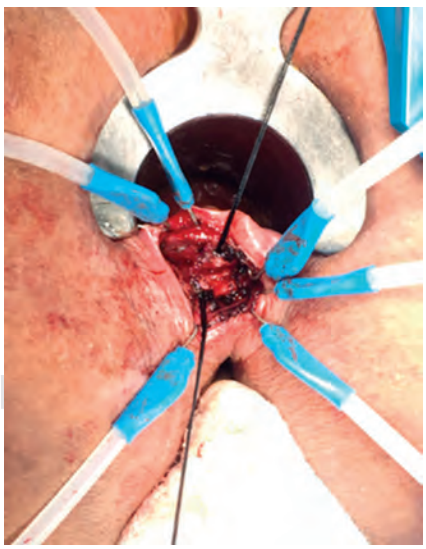

Figure 2: *Fistulous tract referred with silk thread and sectioned.*

RESULTS

During the study period, 23 patients were included, 20 male (87%) and three females. The median age was 46 years. Only three of the patients had comorbidities such as type 2 diabetes and high blood pressure (13.04%). One patient had a history of smoking. Seven of the patients were obese (30.4%) and nine (39.13%) had a drainage set in place. However, this did not mean any advantage for the subsequent performance of the LIFT technique. All subjects had high trans-sphincteric fistulas, 82.6% had a fistulous tract longer than 3 cm, the longest measuring 8 cm. The length of the fistulous tract did not influence the outcome. A LIFT technique was performed in all patients; one patient (4.3%) presented recurrence after nine months and a low anterior trans-sphincteric fistula. The mean follow-up was 12 months, with the shortest being eight months and the longest 24 months; no patient was lost to follow-up. Despite being considered complex fistulas, recurrence was only evidenced in one patient who was scheduled for fistulotomy, with resolution of the condition.

In the postoperative follow-up period, three patients presented perianal abscess one month later (13.04%) that required drainage and antibiotic use based on metronidazole 500 mg orally every eight hours for 10 days, with subsequent resolution of the infection. Four patients (17.39%) presented outflow of seropurulent non-fetid seropurulent fluid through a secondary orifice, which was managed with metronidazole 500 mg orally every eight hours for 10 days, with subsequent resolution of the condition. The wounds that presented serous or sero-hematic fluid leakage after the surgical procedure closed between 6-8 weeks later. In some cases, metronidazole was administered 500 mg orally every eight hours for 10 days. No individual presented fecal incontinence after the surgical procedure. The median Wexner score was 0.

DISCUSSION

The management of anal fistula is a challenge for the colorectal surgeon, and the literature shows variable outcomes. The ideal surgical management should include closure of the fistula, a low recurrence rate and preservation of the anal sphincter.

The concept of the inter-sphincteric approach was first published by the St. Marks group in 1993, with a series of 13 patients with drainage of the inter-sphincteric space, closure of the fistulous orifices and wound closure. However, the fecal continence-preserving LIFT technique in complex fistulas was first described in 2007 by Rojanasakul et al. for complex anal fistulas as a sphincter-preserving technique, with a success rate ranging from 40-95%. According to what has been reported in the literature, this technique can be performed in low inter-sphincteric or trans-sphincteric fistulas; however, high recurrence rates have been reported and it is considered that a fistulotomy can be performed in most of these cases. Only one patient in our series reported recurrence as a simple fistula and it resolved with the performance of a fistulotomy.

The impact on continence is usually scarce or null, as was seen in our case series, so it represents an important consideration of the technique since this does not occur with most of the existing techniques to treat complex anal fistulas.

In our experience, the placement of a drainage seton prior to the LIFT technique does not offer any advantage since the patients who did not have a previous placement of such seton presented the same results in the short- and medium-term. It is known that the presence of a low fibrous tract hinders or prevents the performance of this technique. However, the previous placement of the seton does not guarantee a much more fibrous tract.

The LIFT technique is a particularly good option for the resolution of complex fistulas. In our series we had a success rate higher than 90%, considering the adequate selection of the patients and that the fistulas were of cryptoglandular origin with a high trans-sphincteric trajectory. Regarding the surgical technique, we consider that the fundamental step to avoid fistula recurrence is not to significantly thin the fistulous tract, as well as to verify that there is no leakage with the use of hydrogen peroxide irrigation. In case

of recurrence, we recommend reinforcement stitches with Vicryl® thread.

CONCLUSIONS

In our experience, the LIFT technique proved to be a safe, reproducible surgery, with low morbidity and no fecal incontinence, with a success rate of 95%, so it could be considered the first line of surgical treatment for high trans-sphincteric complex anal fistulas.

It can be used after the placement of a seton or the performance of some other surgical procedure that had not achieved resolution of the anal fistula. Even if the LIFT technique fails, the fistula can be treated with fistulotomy or with a new LIFT procedure.

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REVIEW ARTICLE

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Giant liver cyst as incidental finding secondary to severe abdominal trauma ten years after: a case report and review of the literature

Quiste hepático gigante secundario a trauma abdominal severo. Hallazgo a 10 años y revisión de la literatura

Pablo Magaña-Mainero,[*] Daniel Garay-Lechuga,[*]
Rafael Jiménez-Martínez,[‡] Juan Carlos Vázquez-Minero[§]

Keywords:
Hepatic liver, post-traumatic, giant cyst.

Palabras clave:
Hígado hepático, postraumático, quiste gigante.

ABSTRACT

Introduction: Abdominal trauma is one of the most frequent reasons for admission to the emergency department. Hepatic trauma represents the main cause of death in blunt abdominal trauma with a fatality rate of up to 15%. Hepatic cysts are the least frequent sequelae. **Objective:** To present a rare clinical case of giant liver cyst and review of the literature. A 40-year-old male case, with a history of automobile accident that required surgery in which hepatic resection was performed is presented. Ten years later, he came to the emergency department again with multiple contusions due to aggression by third parties and during the radiological approach a giant hepatic cyst was detected. **Material and methods:** A review of the international literature was made through electronic search engines, obtaining only five original articles limited to case reports. **Result:** There is no reliable algorithm to follow for the management of post-traumatic liver cysts because the evidence described is limited to case reports. There are no management standardized approaches, and they are particular to each case. **Conclusions:** Post-traumatic liver cysts represent a low percentage in the incidence of liver pathology and invasive treatment is reserved for those patients showing local complications. In our case, the patient had no symptoms or complications caused by the cyst despite its size and time of evolution.

RESUMEN

Introducción: *El trauma abdominal es uno de los motivos más frecuentes de ingreso al servicio de urgencias. El trauma hepático representa la principal causa de muerte en el trauma abdominal cerrado con una tasa de hasta 15%. Los quistes hepáticos son la secuela menos frecuente.* ***Objetivo:*** *Presentar un caso clínico raro y revisión de la literatura. Masculino de 40 años de edad, con antecedente de accidente automovilístico que requirió cirugía en la cual se realizó resección hepática. 10 años después, acude al servicio de urgencias policontundido por agresión de terceras personas, durante el abordaje radiológico se detecta un quiste hepático gigante.* ***Material y métodos:*** *Se hizo una revisión de la literatura internacional a través de buscadores electrónicos, obteniendo sólo cinco artículos originales limitados a reportes de caso.* ***Resultado:*** *No existe un algoritmo fi dedigno a seguir para el manejo de los quistes hepáticos postraumáticos debido a que la evidencia descrita se limita a reportes de casos con abordajes no estandarizados y particulares de cada caso.* ***Conclusiones:*** *Los quistes hepáticos postraumáticos representan un porcentaje bajo en la incidencia de la patología hepática y el tratamiento invasivo se reserva a aquellos pacientes que muestran complicaciones locales. En nuestro caso, el paciente carecía de sintomatología o complicaciones ocasionadas por el quiste a pesar del tamaño y tiempo de evolución.*

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INTRODUCTION

Hepatic trauma is frequent in both penetrating and blunt trauma; mortality in hepatic trauma depends on the degree of injury, with grade VI injuries being frequently fatal.[1] Hepatic trauma usually has sequelae, among which are: biliary leakage, abscesses, ischemic necrosis, etc. Hepatic cysts are the least frequent sequelae.

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CASE PRESENTATION

This is the case of a 40-year-old man with a history of a car accident 10 years prior to his admission. He required surgery for blunt abdominal trauma, with cholecystectomy and liver resection, the extent of which is unknown, as well as intestinal resection and repair of a femoral vascular lesion. This present time he was taken by paramedics to the emergency room after being assaulted by third parties. He presented multiple contusions in the head, thorax, abdomen, and thoracic limbs, after which he was run over by a car with the vehicle passing over his abdomen.

On admission he was anxious, alert, and oriented. His initial ATLS (Advanced Trauma Life Support) assessment revealed no hemodynamic compromise, no neurological deficit, thorax with dermabrasions, bilateral ventilated lung fields, and basal hypoventilation of the right hemithorax. The abdomen showed skin tire marks, and was soft, depressible with deep generalized tenderness on palpation, and peritoneal irritation signs in lower quadrants. His thoracic limbs had dermabrasions on both forearms. ATLS protocol films were taken. The chest X-ray *(Figure 1)* showed right hemithorax with elevation of the hemidiaphragm, without pneumothorax or pleural effusion. A primary FAST (Focused Abdominal Sonography for Trauma) was performed that revealed no fluid in the pericardium, hepatorenal, splenorenal or pelvic spaces. A simple and contrasted thoraco-abdominal-pelvic computed axial tomography scan was performed *(Figures 2 and 3)* in which an image compatible with a simple hepatic cyst of 12. 6 × 14.7 cm was seen.

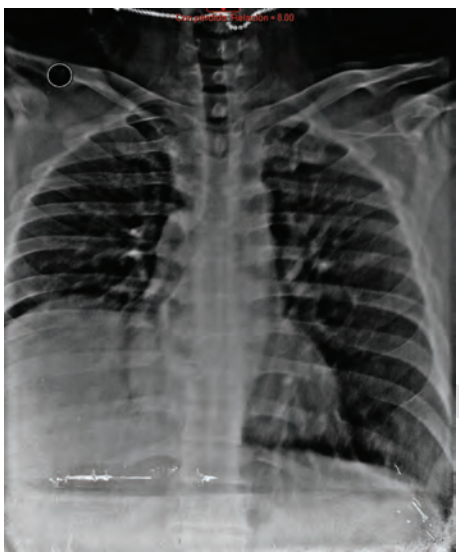

Figure 1: *AP chest X-ray showing elevation of the right diaphragm of undetermined cause.*

Because of the tomographic finding associated to the giant hepatic cyst the patient remained under surveillance for 48 hours after his admission to the hospital. Control laboratory tests and imaging studies were performed *(Figure 4)* that showed no significant changes compared to those obtained during his admission. There was no evidence of hemorrhagic conversion of the hepatic cyst. At discharge, the patient showed symptomatologic improvement, without any other complications.

LITERATURE REVIEW

Cystic liver disease is of diverse origin and the differential diagnosis includes pathologies such as bacterial and parasitic abscesses, biliomas, cystadenomas, and cystadenocarcinomas. They can also be classified according to their origin as congenital or acquired. Among the acquired ones, traumatic and neoplastic disease represent the lowest percentage, leaving post-traumatic cysts as a described entity with a prevalence of less than 0.5%.[2] Diagnosis is mainly achieved through trans-operative findings due to complications and the rest is incidentally diagnosed during imaging techniques.[3] Treatment tends to be conservative; however, there is controversy regarding which one is the best treatment and its availability.[4]

A literature search was performed in PubMed database for original articles in Spanish and English languages with the words MESH in a crisscrossed form "Liver"[Mesh], "Cysts"[Mesh], "Post-traumatic"[Word] to review the literature in terms of incidence, diagnosis, etiopathogenesis, and treatment. Five original articles published between the years 1996 and 2015 were retrieved, all corresponding to case reports. A comparative table between them was created *(Table 1)*.

Figure 2: *Paramedial sagittal section of thorax and abdomen computed tomography scan with a hepatic cystic lesion displacing segments VII and VIII and diaphragm into intrathoracic region.*

The liver is the organ mainly involved in blunt abdominal trauma.[5] Non-infectious liver cysts are an entity first described in 1937 by Sanders,[6] of which the most common presentation is that of congenital origin; thus, acquired cysts secondary to traumatic injury represent the least frequent variety.[7] There is a small number of cases described in the international literature, mainly from Asian countries and in pediatric patients. The most frequent location is in the right lobe and usually they occur as unilocular lesions. The incidental finding is the most frequent presentation with a history of trauma, due to the increasingly frequent non-surgical management of patients with grade IV and V liver injuries.[4,6] However, other series have found no correlation between the degree of trauma and cyst formation.[7] In our case there were no records detailing the degree of injury or the growth rate of the cyst, since the patient remained totally asymptomatic during 10 years prior to current admission, and it was only diagnosed as a finding following the abdominal trauma study protocol.

Cyst formation is secondary to traumatic injury causing leakage of bile and blood resulting in a pseudocyst (no epithelium). Bleeding is usually self-limiting through coagulation, while the flow of bile continues promoting thus the growth of the cyst.[8] For this reason, symptoms are usually late.[9] In our case, despite the size and time of evolution, the patient denied any symptomatology, and had it not been for the current incident, he would not have been diagnosed with this giant liver cyst.

The clinical presentation varies, as most resolve spontaneously and another percentage progress asymptomatically to ultimately cause compressive symptoms, in which case they require treatment.[4] Despite this, complications such as obstructive jaundice, hemorrhagic shock and biliary peritonitis tend to be rare as in our case.

Spontaneous regression of post-traumatic cysts has been described;[6] however, in the case

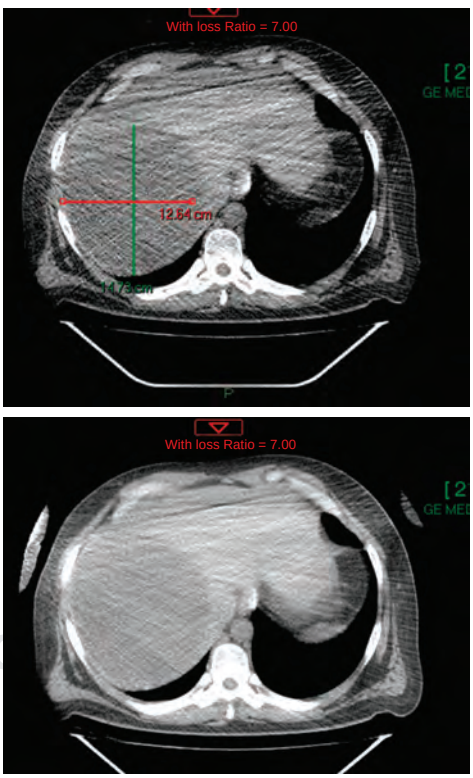

Figure 3: *Thorax and abdomen simple computed tomography scan. Axial section showing a liver cyst in the right lobe measuring 12.64 × 14.73 cm.*

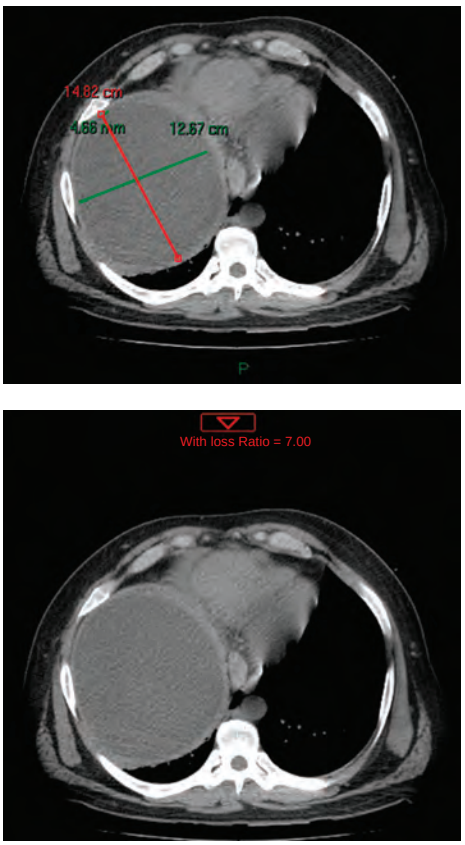

Figure 4: *Thorax and abdomen simple computed tomography scan. Axial section taken 48 hours later showing no volume increase.*

of symptomatic cysts, among the therapeutic options is drainage with a high recurrence at two years. Likewise, it has been reported that once the contents of the fistula are drained, they usually resolve spontaneously.[4] In the case of simple cysts, excision and unroofing are viable therapeutic options with a recurrence rate of 0-20% and a mortality rate of up to 5%. In the case of our patient, conservative treatment was chosen given the absence of symptoms and favorable evolution and no hemorrhagic conversion.

Post-traumatic liver cyst is linked to bile duct injury and another proportion is linked to cholecystectomy, but the etiology of most is linked to a history of trauma.

CONCLUSIONS

For giant liver cysts, the least morbid therapeutic option is percutaneous drainage, mainly indicated in patients with compressive symptoms at the abdominal level. There is no a defined algorithm for the diagnosis and treatment of these lesions within the current classifications; however, tomography scan represents, as in our case, the most efficient and accurate diagnostic tool.

Treatment is controversial and without well-defined indications, and surgical treatment is

Table 1: Literature review of post-traumatic liver cyst.

Reference	Patient (gender and age)	Time of evolution	Hemodynamic status	Cyst size (cm)	Local complications	Management
Chen et al.[2]	Female 63 years	1 year	Stable	12 × 10	Extrinsic stomach compression	Unroofing
Chuang et al.[6]	Female 7 years	5 years 8 months	Stable	11 × 11	Chronic pain*	Resection
Dalal et al.[10]	Male 22 years	3 months	Stable	12 × 10	Chronic pain*	Percutaneous drainage
Singh et al.[9]	Female 34 year	2 months	Stable	10 × 10	Extrinsic stomach compression	Unroofing
Sharma et al.[5]	Female 18 months	2 months	Stable	10 × 11	Chronic pain*	Open drainage

* Chronic pain according to IDC-11.[11]

emphasized in all patients with compressive, painful, or gastrointestinal symptoms.

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CASE SERIES

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Radiofrequency intercostal nerve thermal ablation for pain due to multiple rib fractures

Ablación térmica de nervios intercostales por radiofrecuencia para dolor por fracturas costales múltiples

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Keywords:
Pain, intercostal nerve thermal ablation, blunt chest trauma.

Palabras clave:
Dolor, ablación térmica de nervios intercostales, trauma contuso de tórax.

ABSTRACT

Introduction: Trauma in general and particularly blunt chest trauma continue to be part of the most frequent problems that the physician, surgeon, and emergency systems must face every day. The pain experienced by patients is usually very severe, limiting respiratory mechanics in an important way and consequently, the patient is frequently complicated by pulmonary atelectasis and pneumonic foci due to the lack of good secretion management. The aim of this article is to demonstrate that the use of radiofrequency ablation of intercostal nerves reduces pain in patients with blunt chest trauma, by reviewing 12 cases with blunt trauma and multiple rib fractures treated with radiofrequency guided by fluoroscopy, ultrasound, and impedance to produce thermal ablation of the intercostal nerves involved and thus significantly reduce preoperative or postoperative pain associated with multiple rib fractures. **Material and methods:** Retrospective study of 12 patients with blunt chest trauma and difficulty in ventilating, with a kinematics of: falls from different heights (from 10 to 25 m high), automobile and motorcycle accidents. After informed consent for this type of procedure and under general anesthesia and intubation, intercostal nerve ablation was performed, using fluoroscopy to locate the intercostal nerve involved proximal to the fracture; the correct position of the needle was corroborated by impedance, motor, and sensory stimulation. Ablation was performed at 60 ºC for one minute for each nerve using NeuroTherm® NT 1100 equipment. Qualitative descriptive variables were age, gender, and trauma kinematics. The variables under study were pre-ablation and post-ablation ventilation pain measured with a numerical pain scale (END), and pre-ablation and post-ablation expiratory pain. Quantitative variables were number of fractured ribs, Injury Severity Score (ISS) and Revised Trauma Score (RTS). The quantitative study variables were morphine consumption in mg pre-

RESUMEN

Introducción: *El trauma en general y el trauma contuso de tórax en particular continúan formando parte de los problemas más frecuentes que el médico, el cirujano y los sistemas de emergencia tienen que afrontar todos los días. El dolor que experimentan los pacientes suele ser muy intenso, limitando la mecánica respiratoria de manera importante y por consiguiente, complicándose el paciente con frecuencia por atelectasias pulmonares y focos neumónicos al no contar con un buen manejo de secreciones. El objetivo de este artículo es demostrar que el uso de la ablación por radiofrecuencia de los nervios intercostales disminuye el dolor en el paciente con trauma contuso de tórax, mediante la revisión de 12 casos con trauma contuso y fracturas costales múltiples tratados con radiofrecuencia guiada con fluoroscopia, ultrasonido e impedancia para producir ablación térmica de los nervios intercostales involucrados y de esta manera, reducir de manera importante el dolor preoperatorio o postoperatorio asociado a fracturas costales múltiples.* ***Material y métodos:*** *Tipo de estudio retrospectivo de 12 pacientes con trauma de tórax contuso y dificultad para ventilar, con una cinemática de: caídas de diferentes alturas (de 10 a 25 m de altura), accidentes automovilísticos, y de motocicleta. Previo consentimiento informado para este tipo de procedimiento y bajo anestesia general e intubación se realizó ablación de nervios intercostales, utilizando fluoroscopia para localizar el nervio intercostal involucrado proximal a la fractura, se corroboró la correcta posición de la aguja mediante impedancia, estimulación motora y sensitiva. Se efectuó ablación a 60 ºC durante un minuto por cada nervio empleando el equipo NeuroTherm NT 1100 (marca registrada). Variables: cualitativas descriptivas: edad, sexo, cinemática del trauma. Variables en estudio: dolor a la ventilación preablación y postablación, medidas mediante escala numérica de dolor (END), dolor a la espiración preablación y*

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ablation and post-ablation. Variables were described as mean and standard deviation. **Results:** There was a 70% decrease of pain on exhalation and a 70.8% decrease in opioid consumption. Complications were mild, and transient allodynia in 41.2% of cases was controlled with gabapentin-like drugs for two weeks. **Conclusion:** Thermal ablation of intercostal nerves by radiofrequency in thoracic blunt trauma is useful, reduces pain significantly and allows better ventilation with less consumption of analgesics. This technique could become a new gold standard in pain control in severe thoracic trauma.

postablación. Variables cuantitativas: número de costillas fracturadas, calificación del Injury Severity Score (ISS) y Revised Trauma Score (RTS). Variables cuantitativas del estudio: consumo de morfina en mg preablación y postablación. Descripción de las variables mediante: media y desviación estándar. ***Resultados:*** *Disminución del dolor a la espiración en 70%, así como del consumo de opioides en 70.8%. Complicaciones: alodinia leve y pasajera en 41.2% de los casos controlada con gabapentinoides durante dos semanas.* ***Conclusión:*** *La ablación térmica de nervios intercostales por radiofrecuencia en trauma contuso de tórax es útil, disminuye el dolor en forma significativa y permite mejor ventilación con menor consumo de analgésicos. Esta técnica podría perfilarse como un nuevo estándar de oro en el control del dolor en trauma torácico severo.*

INTRODUCTION

Worldwide, trauma is a public health problem and a leading cause of mortality in all age groups. Quite often, trauma pain requires opioids and is not uncommonly undertreated.

Blunt chest trauma is a frequent problem, whether due to unrestrained motor vehicle accidents, motorcycles, bicycle falls, or falls from own height and being run over. In these cases, multiple rib fractures occur frequently and may be accompanied by hemopneumothorax or even unstable thorax. Regardless of the risk that these pathologies may represent for the patient's life, once they are resolved in the initial evaluation according to the Advanced Trauma Life Support (ATLS) protocol of the American College of Surgeons, the pain persists. This pain is usually very severe, ranging from 9 to 10 on the numerical pain scale, intensifies on deep inspiration and significantly limits the patient's ventilatory mechanics, delaying extubating time in intensive care units due to pain on inspiration and poor secretion management because of the inability to expectorate.

This pain usually requires high doses of opiates with the side effects that this implies such as nausea, vomiting, headache, respiratory depression, sedation of the patient and delirium, and can also mask other injuries such as cranioencephalic trauma, abdominal blunt trauma, and compartment syndrome, which is not uncommon for the three entities to coincide in this trauma kinematics.

Since 1945 thoracic nerve blocks have been used to reduce pain from thoracic trauma. During World War II it was a valuable resource for reducing pain from fractured ribs.[1,2]

However, although infiltration of anesthetics to the affected intercostal nerves produced significant pain relief and analgesic reduction, its effect was short-lived.[3,4]

The installation of a peridural catheter with continuous infusion of opioids improved analgesia in these patients. However, it presented the problem of mobilizing a polytraumatized patient to perform it, in addition to the hypotension associated with the continuous infusion due to vasodilatation associated in hemodynamically unstable patients or with cranioencephalic trauma, aggravating the state of shock and decreasing cerebral perfusion.[5,6]

Radiofrequency acts by producing thermal ablation of the involved intercostal nerve by means of a needle placed in the subcostal canal guided either by ultrasound or fluoroscopy.[7-10]

This permanent damage to the intercostal nerve provides significant analgesia, can be performed with the patient in dorsal

Figure 1: *Fluoroscopic control of intercostal radiofrequency ablation in multiple rib fractures.*

decubitus position without the need for posture changes and may even be carried out in the intensive care unit if ultrasound is used as a guide. The analgesia provided is permanent, which allows the patient to have good respiratory mechanics, prevents pulmonary atelectasis or pneumonia, and reduces the use of analgesics.[11-15]

Based on the above, radiofrequency of the intercostal nerves was started in our hospital to treat pain and improve respiratory mechanics in patients with blunt chest trauma. This work arose from the need to be able to control the severe pain presented by these patients and to improve their respiratory mechanics for early extubating, and it has emerged as an option to traditional medical and surgical treatment of this kind of patients in our hospital. The aim of this article is to describe this case series treated by this method at the Hospital Angeles Lomas in Mexico City, Mexico.

MATERIAL AND METHODS

The physical and, where appropriate, electronic records of patients with blunt chest trauma treated with intercostal nerve radiofrequency at Hospital Angeles Lomas from January 2006 to August 2018 were retrospectively reviewed. During this period, 12 patients were treated with this technique, with prior informed consent of the patient and/or his/her family for the intercostal nerve thermal ablation technique, in addition to the corresponding informed consents signed for other types of surgical treatments that the patient merited due to blunt chest trauma and multiple rib fractures.

Patients were resuscitated according to the ATLS protocol. After their stabilization and having treated priority lesions of other organs (24 to 72 hours later), the patients were subjected, prior intubation, to radiofrequency ablation in the fluoroscopy room, or by ultrasonographic control in the same Intensive Care Unit.

NeuroTherm® thermo-ablation needles, model Simplicity III, were used. The intercostal nerve involved was located proximal to the fracture. The correct position of the needle was corroborated by impedance, motor and sensory stimulation and the intercostal nerves were ablated at 60 ºC for one minute for each nerve using the NeuroTherm NT 1100 equipment *(Figure 1)*.

Pain was assessed using a numerical pain scale, at rest with shallow breathing and with expiration pre-radiofrequency and post-radiofrequency. Pain intensity was also indirectly measured by daily opioid consumption. All patients were conscious when pain was assessed.

To measure pre- and post-radiofrequency opioid consumption, the amount of morphine in milligrams (mg) administered intravenously in 24 hours required by each patient was documented. In the cases in which morphine was not used, other analgesic drugs were converted to mg of morphine, seeking the equivalence of other opioids to morphine to be able to unify and compare the daily consumption of morphine pre-treatment and post-treatment.

RESULTS

During this period, 12 patients with blunt chest trauma and multiple rib fractures were treated with this ablation technique. Five female and seven male patients, ranging in age from 28 to 76 with an average of 57.5 years, with the following trauma kinematics, were included: six automobile accidents,

two motorcycle accidents and four falls (2 from their own height, and one each from 10 and 25 m), with a range of fractured ribs from three to 10 and an average of six ribs. Trauma intensity was graded using the combined trauma score scale and the Trauma Injury Severity Index (TRISS) of the American Association for the Surgery of Trauma with a range of 1.1 to 49.7, a mean of 11.71 and a standard deviation of 13.12 points. Patients with blunt trauma were graded as severe (8.3%) using these scales from 1 to 12.

Figure 2: *Multiple rib fractures due to blunt trauma, third to tenth ribs, right hemithorax. CT scan with bone reconstruction.*

All 12 patients had a mean number of fractured ribs of 5.75 with a standard deviation of 2.18. Pain was measured at rest with shallow breathing and on exhalation *(Figure 2)*.

Pain at rest with shallow breathing before radiofrequency had a mean of 7.6 points on the numerical scale with a standard deviation of 2.18 points. After intercostal nerve ablation the mean was 2.08 with a standard deviation of 1.73 on the numerical pain scale. Pain on exhalation was measured before radiofrequency with a mean of 9.75 and a standard deviation of 0.62 and after radiofrequency with a mean of 2.75 and a standard deviation of 1.36 using this same scale.

The dose in mg per day of morphine equivalent opioids administered intravenously before radiofrequency had a mean of 26.67 mg in 24 hours with a standard deviation of 10.5 mg and after radiofrequency was 7.79 mg in 24 hours with a standard deviation of 0.28 *(Table 1)*.

Pain decreased by 70% post-radiofrequency at rest, and at expiration was also reduced by 70%, and opioid consumption in mg per 24 hours was reduced by 70.8%.

The complications observed with the radiofrequency technique were mild and consisted mainly of transient allodynia in

Table 1: Post-ablation pain assessment and morphine consumption (N = 12).

	Female	Male	Total
Parameter	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Number of fractured ribs	5.4 ± 2.70	6.00 ± 1.91	5.75 ± 2.18
Pain (VAS) resting w/shallow breathing Pre ablation DRSPA	7.2 ± 2.39	7.71 ± 2.36	7.50 ± 2.28
Pain (VAS) rest w/shallow breathing Post ablation DRSPOA	2.6 ± 1.52	1.71 ± 1.89	2.08 ± 1.73
Pain (VAS) normal expiratory Pre ablation DEPA	10.0 ± 0.00	9.57 ± 0.79	9.75 ± 0.62
Pain (VAS) normal expiratory Post ablation DEPOA	3.0 ± 1.22	2.57 ± 1.51	2.75 ± 1.36
Dose/day mg opioid morphine equivalent Pre ablation DO = M	25.8 ± 13.40	27.29 ± 12.85	26.67 ± 12.49
Min-max	10-40	10-50	10-50
Opioid dose (mg) morphine equivalent Post ablation DO = M Post ablation	7.8 ± 6.11	7.79 ± 10.30	7.79 ± 8.45
Min-max	0-16.5	0-28	0-28

41.2% of the patients that was controlled with gabapentin-like drugs every eight hours for two weeks. There were no serious complications or mortality in this series. In some cases, fixation of the fractured ribs was combined with trans operative intercostal thermal ablation when the patient presented with an unstable thorax or rib displacement.

Complications attributed to this technique were minor, mainly due to mild and transient allodynia in 41.2% of the cases controlled with low dose gabapentin-like drugs for two weeks. There were no cases of post-ablation pneumothorax or mortality in this series.

DISCUSSION

Currently, pain is considered the fifth vital sign and pain relief is now seen as a fundamental right of the patient at the international level, and it has been decreed by the World Health Organization (WHO) as one of the human rights. Currently, it is a serious breach of professional ethics not to treat or undertreat the patient's pain.

Pain management in the trauma patient is a challenge. Initial assessment and treatment of life-threatening or limb-threatening injuries takes priority and initiation of analgesia is often postponed until the patient is stable. The first-line treatment for the trauma patient is low-dose opioids administered intravenously. They act rapidly, are effective and are indicated in severe pain. However, there are multiple reasons why the trauma patient receives insufficient analgesia: physicians are reluctant to administer opioids systemically due to fear of aggravating hemodynamic instability or respiratory depression with airway loss. In addition, in patients with head injury, there is concern about masking the clinical picture or producing delirium, particularly in elderly patients, which may confound the clinical picture of head injury. Frequent patient assessments are usually needed without sedation and it is not possible to estimate whether the patient is really deteriorating.[16,17]

Another reason why patients do not receive adequate analgesia is because it is difficult to measure pain in trauma because patients are often intubated and mechanically ventilated, and communication cannot be established.[18]

Based on the above, multimodal analgesia and in particular regional analgesia, such as radiofrequency ablation, significantly reduce opioid requirements, shortening the stay in the intensive care unit and emergency rooms, recovery, reducing the adverse effects of these drugs such as nausea, vomiting, headache, respiratory depression, delirium, vasodilatation with hypotension, constipation, pruritus, and immunosuppression all of which requires more staff for surveillance and monitoring.

In this case series it was evident how radiofrequency of the intercostal nerves significantly reduced morphine consumption in mg per 24 hours (70.8%) by producing high quality analgesia that is specific to the chest wall, and therefore, without systemic effects.

In our patients, pain managed with intercostal nerve ablation by radiofrequency decreased from severe pain (from 7-10 points) with a mean of 7.5 points with superficial ventilation measured with a numerical pain scale, to a pain of 2-4 with a mean of 2, being a mild pain and attributed to the fact that there are also other causes of pain in thoracic trauma independent of rib fractures. This represented an approximate relief of 70% in most cases since it was possible to manage pain without opiates and with other types of analgesics, which was of great help for the intensive care unit since the patients could be extubated earlier due to a much better respiratory mechanics, achieving a deeper inspiration and expiration and consequently, a better management of airway secretions with less possibilities of complications like pulmonary atelectasis and pneumonia.

The results observed in our study agree with the world literature in observing a significant reduction in daily morphine consumption.[15,19]

CONCLUSION

Trauma is a worldwide public health problem and one of the main causes of mortality in all age groups. The pain produced particularly by blunt trauma of the thorax is severe, usually requires opiates, and it is not uncommon to be undertreated for several reasons.

Thermal ablation of the intercostal nerves by radiofrequency in blunt chest trauma with multiple rib fractures and unstable thorax is a useful and safe procedure for the treatment of these patients. In this case series it was evident how radiofrequency of the intercostal nerves significantly decreased morphine consumption in mg per 24 hours (70.8%) by producing high quality analgesia specific to the chest wall and therefore without side effects.

This technique significantly reduces pain and allows better ventilation with less consumption of other analgesics.

Thermal ablation of the intercostal nerves may emerge as a new gold standard for pain control in severe chest trauma. Larger studies with higher number of patients are required to further validate these initial conclusions.

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Hepatic rupture in HELLP syndrome. Review of surgical treatment

Ruptura hepática en el síndrome de HELLP. Revisión del tratamiento quirúrgico

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HELLP syndrome, hepatic rupture, hepatic hematoma, preeclampsia, hepatectomy.

Palabras clave:
Síndrome de HELLP, ruptura hepática, hematoma hepático, preeclamsia, hepatectomía.

ABSTRACT

Introduction: Hepatic rupture in HELLP syndrome is a complication that is fatal for the mother-child pair in up to 80% of cases. Multiple therapeutic options have been described, such as hepatic packing, segmental resections, and even liver transplantation for severe cases. **Clinical case:** A cesarean section was performed in a 32-year-old woman with HELLP syndrome and a hepatic subcapsular hematoma was found in the left lobe. Initially hepatic packing and ligation of the common hepatic artery were carried out, and later a left hepatectomy was done as definitive management. **Discussion and conclusions:** The reported case was successfully treated by various surgical methods. Early recognition of this complication, aggressive surgical management and multidisciplinary support are the basis for reducing morbidity and mortality.

RESUMEN

Introducción: *La ruptura hepática en síndrome de HELLP es una complicación que resulta mortal para el binomio madre-hijo hasta en un 80% de los casos. Múltiples opciones terapéuticas se han descrito, tales como empaquetamiento hepático, resecciones segmentarias, e incluso trasplante hepático para casos severos.* ***Caso clínico:*** *Mujer de 32 años con síndrome de HELLP, se realiza cesárea encontrándose hematoma subcapsular hepático en lóbulo izquierdo, inicialmente se realizó empaquetamiento hepático y ligadura de la arteria hepática común, y hepatectomía izquierda como manejo definitivo.* ***Discusión y conclusiones:*** *El caso reportado fue tratado exitosamente mediante diversos métodos quirúrgicos. El reconocimiento temprano de esta complicación, el manejo quirúrgico agresivo y el apoyo multidisciplinario son las bases para disminuir la morbimortalidad.*

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INTRODUCTION

HELLP syndrome is named for the clinical entities that comprise it: hemolysis, elevated liver enzyme levels, and low platelet counts forming the acronym. It was first described in 1982 and represents a severe form of preeclampsia, which biochemically is characterized by hemolysis, elevated liver enzymes, and low platelet counts.[1] It has a frequency of 0.17 to 0.85% of all pregnancies and its presentation is more common in multi-gestation, Caucasian, and older women.[2] Reported complications secondary to this syndrome include the development of cerebral hemorrhage, renal failure, pulmonary edema, and hepatic rupture, all of which occur in 12.5 to 65% of all cases.[3]

Symptoms of a hepatic hematoma rupture in this syndrome are mainly the presence of persistent epigastric severe pain, or right upper quadrant abdominal pain, associated to hypovolemic shock.

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Termination of pregnancy in these cases should be expeditious.[4]

The formation and rupture of a subcapsular hematoma at the hepatic level represents one of the most serious events for the mother and the product. The morbimortality rate is extremely high, so most cases require timely, intensive, and multidisciplinary surgical management. The incidence of these complications varies between 1:40,000 to 1:250,000 pregnancies.[5] Spontaneous rupture of the subcapsular hematoma can produce profuse intraperitoneal bleeding, endangering patient's life. This entity is associated with a maternal mortality of 60 to 80% and fetal mortality of 56 to 75%.[6] In Mexico, 79 maternal deaths due to hepatic rupture were reported by Vitelio Velasco over a period of 15 years.

We present the case of a woman with HELLP syndrome, who presented with ruptured hepatic subcapsular hematoma and severe hypovolemic shock that was successfully treated at the *Hospital de Especialidades del Centro Médico Nacional La Raza*, Mexico.

CASE PRESENTATION

A 32-year-old woman with an obstetric history of three pregnancies, two products obtained by cesarean section, as well as a donor nephrectomy in 2011, presented in her third pregnancy at 34 weeks of an apparently normal gestation. She began suffering 48 hours prior to admission to our hospital with a clinical picture characterized by abdominal pain in the epigastric region; 24 hours after the onset of the clinical picture, nausea and vomiting were added with persistent elevation of blood pressure and the finding of thrombocytopenia, for which reason she was sent to a second level hospital where severe preeclampsia and HELLP syndrome were diagnosed.

On admission, she was found to have hypertension that was difficult to control with a mean arterial blood pressure ranging between 100 and 120 mmHg. The initial laboratory test reported were as follows: hemoglobin 10 g/dl, hematocrit 32%, with schistocytes in the smear, platelets 99,000 mm^3, AST 402 U/L, ALT 32 U/L, uric acid 4.8 mg/dl, alkaline phosphatase 108 U/L; urinalysis was reported as pathological, with a protein level of 400 mg/dl, and countless white blood cells.

An obstetric US was performed showing a single live product with a fetal heart rate of 140 beats per minute. An emergency cesarean section was performed, obtaining a single live product, and finding a subcapsular hepatic hematoma of approximately 10 × 10 cm, for which an exploratory laparotomy was performed in the same surgical event. Hemorrhage was estimated in 1,500 ml. A hepatic packing was placed, and she was subsequently admitted to the Intensive Care Unit. At that time, she was hemodynamically stable, with mean arterial pressure above 70 mmHg. Two hours later she developed hypovolemic shock, arterial hypotension, with evidence of bleeding, and showed a hemoglobin level of 5.5 g/dl and a platelet count of 80,000 mm^3. A new surgical exploration was performed that revealed hemoperitoneum of 1,000 ml and hepatic hemorrhage at the level of the round ligament and at the intersection of both lobes. A new hepatic packing was placed. The reported bleeding was 1,000 ml during the procedure. The patient was readmitted again to the Intensive Care Unit, and up to this moment six red blood cell concentrates, 10 bags of fresh frozen plasma and six platelet apheresis had been transfused. She was sent to a third level of care hospital. At the moment of her arrival to this last hospital, she was found to be in a pretty bad condition, with mechanical ventilatory support, blood pressure of 89/58 mmHg and a hemoglobin level reported in arterial blood gases of 5 g/dl, as well as data of consumption coagulopathy. She was admitted directly to the operating room where a hemoperitoneum of 1,500 ml and a broken subcapsular hepatic hematoma in the left lobe grade III were found. Ligation of the common hepatic artery and accessory left hepatic artery was performed, as well as a new hepatic packing with four compresses was placed *(Figure 1)*. Three

units of fresh plasma and five units of red blood cell concentrates were transfused in the intraoperative period.

The patient was admitted to the Intensive Care Unit in a stable condition with a mean arterial pressure of 70 mmHg. A hepatic unpacking was performed 48 hours later without evidence of active bleeding. The liver showed adequate consistency, color, turgor, and a limited hematoma *(Figure 2)*. Twenty-four hours later, mechanical ventilatory support was withdrawn without complications. Thereafter, she had an adequate clinical evolution with diet tolerance, and drains without evidence of active bleeding. Laboratory tests taken after seven days showed a hemoglobin level of 11 g/dl, platelet count of 332,000/mm^3, and coagulation times within normal parameters. Also, the liver function tests were found to be within normal parameters. She was discharged from the Intensive Care Unit in stable condition. Nine days postoperatively she presented persistent fever, and a CT scan was performed showing a large area of necrosis in the left hepatic lobe and an intraparenchymal hematoma of 15 × 10 cm *(Figure 3)*, which lead to perform another exploratory laparotomy with the finding of a necrotic left hepatic lobe and an extensive hematoma of 1,500 ml *(Figure 4)*; the hematoma was evacuated and a left hepatectomy was performed *(Figure 5)*.

Subsequently, the evolution was favorable, and the patient was discharged 10 days later with a normal control CT scan, platelets within normal parameters, liver function tests without alterations, and proteinuria that had decreased to 50 mg/dl. The patient continued to be followed up by the nephrology service She had complete recovery of renal function, and no subsequent events of high blood pressure.

DISCUSSION

Hepatic rupture in HELLP syndrome is a rare complication with high mortality, which compromises the life of the mother-child pair. Initially described by Abercrombie in 1844, it presents clinically with abdominal pain predominantly in the right hypochondrium or epigastrium, right shoulder pain, nausea, vomiting and evidence of hypovolemic shock.[4] Hepatic rupture can occur before, during or after delivery.

The cause of subscapular and intrahepatic hematoma formation in HELLP syndrome is not yet well understood, but it has been shown that patients with eclampsia develop areas of necrosis and fibrin deposits in the hepatic sinusoids, causing obstruction to blood flow and hepatic distension, resulting in epigastric and right hypochondrium pain.[7] The scar tissue in these cases is at greater risk of rupture due to the elevated blood pressure characteristic of this syndrome, forming a subcapsular hematoma, which tends to rupture easily due to any trauma or the expansion of the hematoma itself.[6]

Hematoma formation is more frequent in the right hepatic lobe. In a study by Henny and collaborators in which 75 patients with hepatic hematomas were included, it was found that in 75% of the cases the hematoma was in the right lobe, 11% in the left lobe and 14% in both lobes.[7]

Management of this complication requires clinical suspicion, as well as early diagnosis and aggressive treatment. The diagnosis should include, in addition to laboratory tests aimed at monitoring the alterations inherent to HELLP syndrome (blood cell count, and coagulation and liver function tests), imaging studies to help us determine the size of the hematoma and the amount of free intra-abdominal fluid. Ultrasound is the study of choice in most cases, but computed tomography (CT) scan has a great sensitivity to determine these alterations. However, it is not indicated as a first study in patients with hemodynamic instability.

Interruption of pregnancy is an important part of treatment as it eliminates placental stimulation, so pulmonary maturation should be initiated in patients with pregnancies of less than 34 weeks of gestation and severe preeclampsia, and blood pressure control is essential.[4]

Few reports have been described of non-surgical management in cases of small and contained hepatic hematomas, in

which the evolution of the hematoma must be strictly monitored by imaging control. This approach is only indicated in patients with hemodynamic stability and without coagulopathy.[8,9] Surgery is the procedure of choice, since it is associated with better survival. The refinement of surgical techniques has led to a decrease in mortality, with a 30% reduction described in the latest published series.[5]

Surgical options described include hepatic packing, fibrin sealant management, direct suturing of damaged liver tissue, hepatic artery ligation or embolization, hepatic lobectomy, orthotopic liver transplantation, or a combination of these procedures.[10] Patients should be treated in a center with expertise in liver trauma or by surgeons specializing in liver surgery and transplantation.

Hepatic packing by means of compresses does not always guarantee good results since the patients present with thrombocytopenia. It is especially important to perform a correct packing. The complete mobilization of the liver is achieved by means of the section of its ligaments. Care must be taken in cases with contained subcapsular hematoma, since avulsion of the hepatic capsule can be provoked.

Local control of hepatic hemorrhage, using hemostatic agents or suturing the bleeding

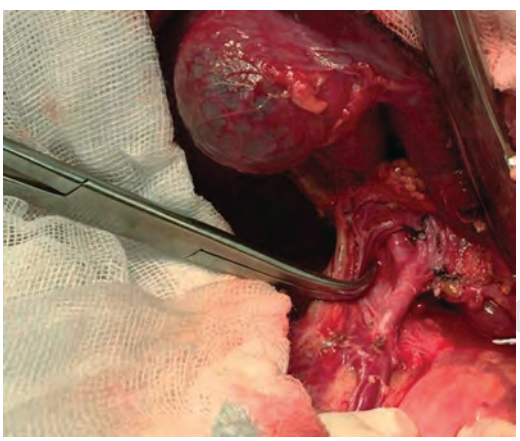

Figure 1: *Dissection of the hepatic hilum with ligation of the common hepatic artery and accessory left hepatic artery.*

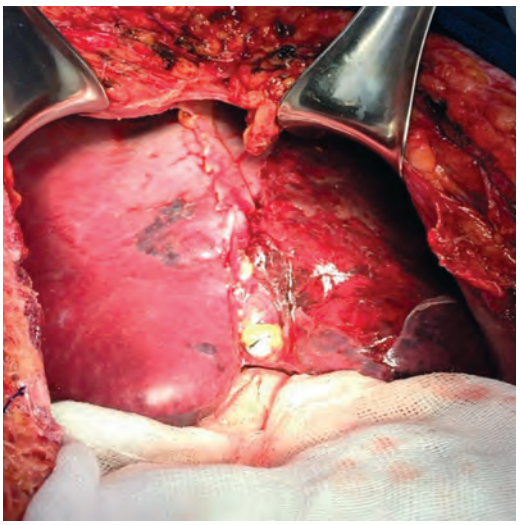

Figure 2: *Appearance of the liver during unpacking (48 hours later), without evidence of active bleeding, with limited hematoma.*

hepatic surface, is of limited value with a low success rate especially in cases of extensive hematomas.[11]

Interruption of hepatic artery flow, either by direct ligation or angioembolization, has been used in various pathologies such as hepatic trauma, ruptured hematoma, or spontaneous hepatic hemorrhage, is in many cases an effective method of hemorrhage control.[12] In general, hepatic artery ligation is well tolerated. It is common to find transient elevation of liver enzymes, mainly aspartate aminotransferase (AST) and alanine aminotransferase (ALT), and it is important to remember that in patients with chronic hepatic pathology these enzymes may be already increased. Cholecystectomy is always necessary, since ligation proximal to the origin of the cystic artery may cause vesicular gangrene. It has been shown that the development of hepatic reperfusion through collateral arteries after hepatic artery ligation develops approximately 10 hours after the procedure;[13] however, one of the drawbacks of this method is the development of focal areas of hepatic necrosis, which can become infected.

Arterial ligation can be performed selectively in the right hepatic artery, left

hepatic artery or common hepatic artery; this will depend largely on the characteristics and site of the hematoma. A transient clamping can be performed to determine if there is a decrease in bleeding, and then the definitive procedure can be performed by ligation,

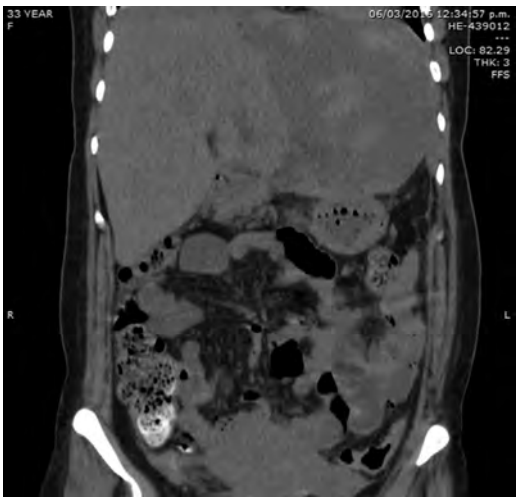

Figure 3: *Tomographic control nine days after with findings of necrosis in the left hepatic lobe and an intraparenchymal hematoma measuring 15 × 10 cm.*

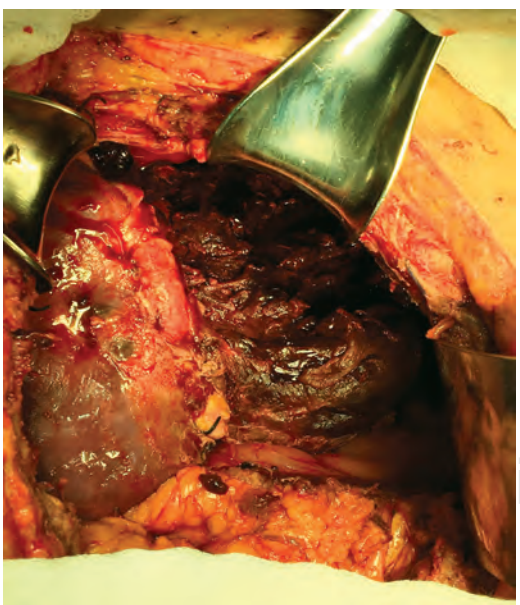

Figure 4: *Exploratory laparotomy nine days after surgery with necrotic left hepatic lobe and an extensive hematoma of 1,500 ml.*

making sure that there are no aberrant hepatic arteries. The left hepatic artery is generally a branch of the left gastric artery, and the origin of the right accessory hepatic artery may be at the level of the superior mesenteric artery.[4] In the study performed by Araujo, ligation of the artery was reported in 50% of patients with hepatic hematoma, with good results in the control of hepatic hemorrhage and no evidence of subsequent liver damage.[8]

The most severe cases occur when there is an important degree of hepatic necrosis or devascularization. If these are limited, anatomic or non-anatomic hepatic resections can be performed, according to the area involved. In cases of uncontrollable bleeding or fulminant hepatitis, orthotopic liver transplantation is the treatment of choice, which should be performed before the appearance of septic complications or multiorgan failure.[14]

The treatment in each case must be initially focused on saving the patient's life, which sometimes implies performing

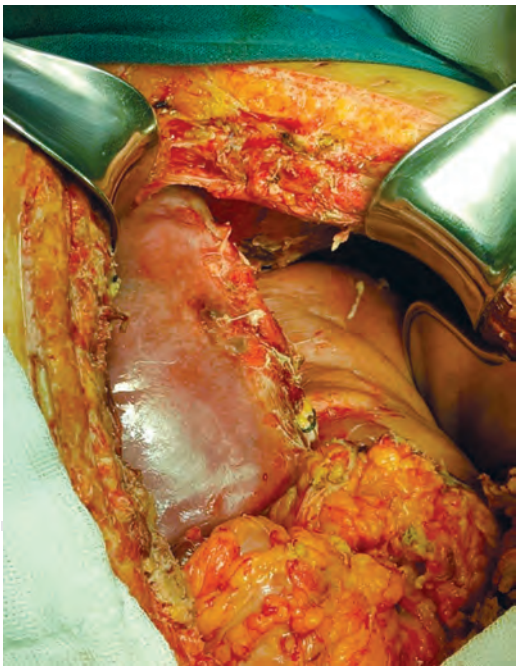

Figure 5: *Appearance of the liver remnant after left hepatectomy.*

a first surgical intervention for damage control, with hepatic packing and arterial ligation, sending to intensive care to improve the patient's general conditions and, in a second stage, performing the unpacking and a second look surgery, in which the definitive treatment can be performed. Resolutive management may involve the performance of segmental liver resections or, in the most severe cases, liver transplantation *(Figure 6)*.

HELLP syndrome is a late complication of preeclampsia-eclampsia, which makes it necessary to emphasize the importance of medical management as one of the most important preventive measures to avoid the occurrence of hepatic rupture, in addition to the importance of a good pregnancy control, even when the pregnancy is of low risk, with monitoring of blood pressure, and laboratory tests that include blood cell counts, liver function tests and urinalysis, with the aim of detecting preeclampsia or eclampsia in a timely manner.

CONCLUSIONS

Hepatic rupture in HELLP syndrome is a serious complication that continues to have a high mortality rate worldwide. Early recognition of this complication together with aggressive surgical management and multidisciplinary support are the basis for reducing the associated morbidity and mortality. Multiple surgical

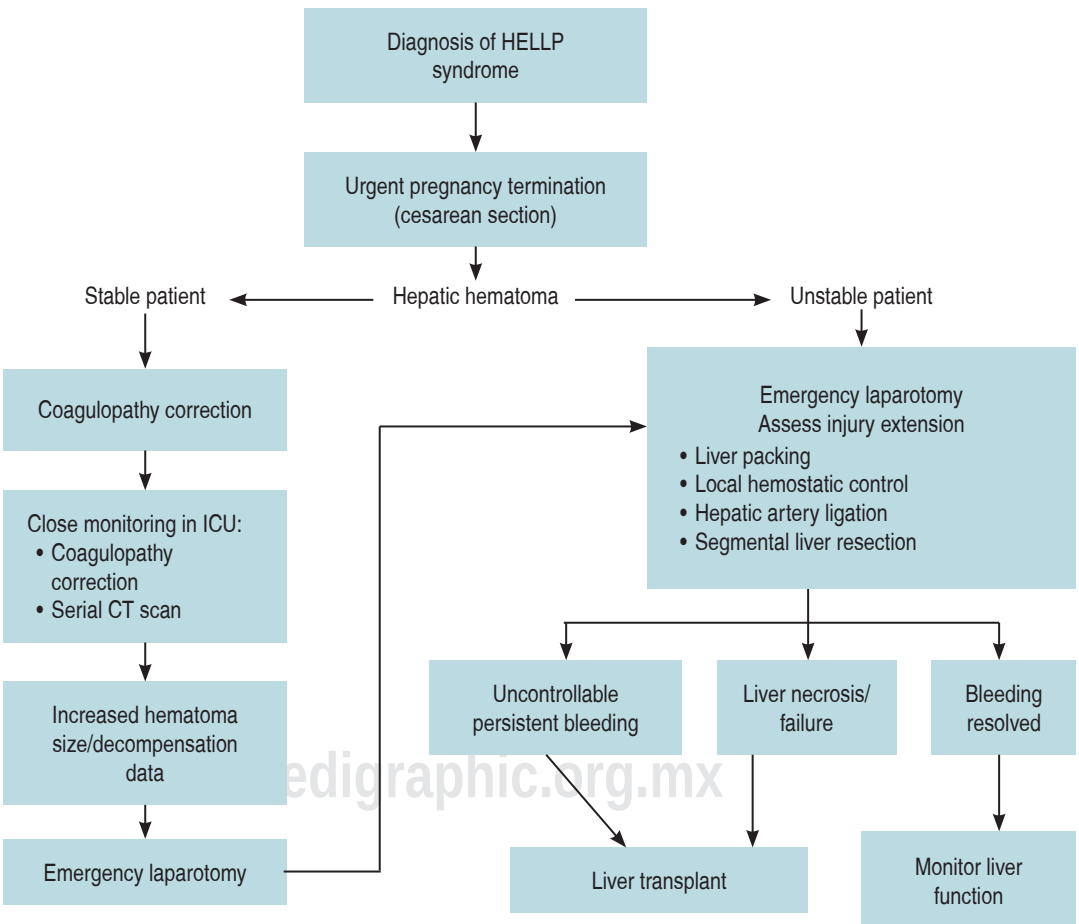

Figure 6: *Management of hepatic hematoma in HELLP syndrome.*

techniques have been described with different results, it is important to evaluate each case according to its severity and to refer to centers specialized in liver surgery and transplantation in a timely manner.

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Choledochal cyst

Quiste de colédoco

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Keywords:
Common bile duct cyst, hepaticojejunal anastomosis, bile duct, cholangiocarcinoma, endoscopic retrograde cholangiopancreatography.

Palabras clave:
Quiste de colédoco, hepaticoyeyunoanastomosis, conducto biliar, colangiocarcinoma, colangiopancreatografía retrograda endoscópica.

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ABSTRACT

Objective: To present the case of a patient with a common bile duct cyst and its treatment, due to its low frequency and high risk of developing cholangiocarcinoma. Case presentation: A 26-year-old woman with clinical picture of abdominal pain in the right hypochondrium and epigastrium, intolerance to cholecystokinetic foods, in addition to conjunctival jaundice, went to the emergency department and was managed with analgesics; and ultrasound of the liver and biliary tract was performed, reporting normal gallbladder, normal liver, proximal common bile duct of 7 mm, dilated distal common bile duct of 35 mm with microliths inside. She was admitted to the hospital and laboratory tests were requested, which were reported within normal values. Endoscopic retrograde cholangiopancreatography was performed, reporting a type I spindle-shaped common bile duct cyst, so she was scheduled for surgery with resection of the cyst plus cholecystectomy and Roux-en-Y hepaticojejunal anastomosis with 3-0 prolene sutures. A 6 × 4 cm common bile duct cyst was found, extending from the common hepatic duct to the pancreas. She had a normal postoperative evolution, tolerated the oral route on the fourth day of surgery, and was discharged on the seventh day. She was seen as outpatient and was found with discomfort typical of surgery, but she was anicteric, and the surgical wound was healing normally; the control ultrasound was normal as well as laboratory tests. **Conclusions:** Choledochal cysts are a rare condition. One case is found in 100,000 to 150,000, predominantly in Asian countries; 20 to 30% are diagnosed in adults. It has a high possibility of developing into a cholangiocarcinoma, hence the importance of resecting the cyst. Type I remains the most frequent as is reported in the world literature.

RESUMEN

Objetivo: *Presentar el caso de un paciente con quiste de colédoco y su tratamiento, debido a su baja frecuencia y al riesgo elevado a desarrollar colangiocarcinoma. Presentación: Mujer de 26 años con cuadro clínico de dolor abdominal en hipocondrio derecho y epigastrio, intolerancia a los colecistoquinéticos, además de ictericia conjuntival, acude a urgencias manejándose con analgésicos, se efectúa ultrasonido de hígado y vías biliares reportando vesícula normal, hígado normal, colédoco proximal de 7 mm, colédoco distal dilatado de 35 mm con microlitos en su interior. Se ingresa a piso y se solicitan exámenes de laboratorio, los cuales se reportaron normales. Se efectúa colangiopancreatografía retrógrada endoscópica reportando quiste de colédoco fusiforme tipo I, por lo que se programa para cirugía efectuándole resección del quiste más colecistectomía y hepaticoyeyunoanastomosis en Y de Roux con prolene del 3-0. Se encuentra quiste de colédoco de 6 × 4 cm que abarca desde el hepático común hasta páncreas. Evolucionó de manera satisfactoria, tolerando vía oral al cuarto día de operada, egresándose al séptimo día; es vista en la consulta con molestias propias de la cirugía, pero se encuentra anictérica y con herida quirúrgica bien cicatrizada, ultrasonido de control normal. Exámenes de laboratorio de control normales.* ***Conclusiones:*** *Es un padecimiento poco frecuente. Se encuentra un caso entre 100,000 a l50,000, de predominio en los países asiáticos; 20 a 30% se diagnostica en adultos. Tiene una incidencia elevada de desarrollar colangiocarcinoma, de ahí la importancia de la resección del quiste. El tipo I continúa siendo el más frecuente, reportándose así en la literatura mundial.*

INTRODUCTION

The common bile duct cyst is the most frequent malformation of the bile ducts in both children and adults; since the limits between the common bile duct cyst and certain morphological anomalies of the bile duct of congenital origin are still not well defined, the term congenital dilatation of the main bile duct seems preferable to that of common

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bile duct cyst, which is more restrictive. It is defined as a congenital entity since it has been found in fetuses and neonates at risk of developing cholangiocarcinoma. It presents one case every 100,000 to 150,000 births, which correspond to Anglo-Saxon figures that are believed to be comparable to those of Mexico, and up to one in every 1,000 in Japan and Asian countries; 20 to 30% of the cysts are diagnosed in adulthood, and they are three to four times more frequent in women.[1-3] Fernandez et al[4] conducted a cross-sectional, retrospective and descriptive study in 2016, where they showed the percentage of the Mexican population that is most affected, from a total of 24 patients who were registered from 2006 to 2012. The study population was taken from the records of patients with diagnosis of choledochal cyst in the Gastroenterology and Pediatric Surgery services of the Pediatric Hospital, Centro Medico Nacional Siglo XXI.[4] Of the 24 subjects with complete records, 18 were women (75%), and six men (25%), being a 3:1 ratio. The most frequent age group at the time of diagnosis of common bile duct cyst was infants, 54.2%, 20.8% in preschoolers, 12.5% in schoolchildren, 8.3% in neonates and 4.2% in adolescents. The age group of patients in which surgery was performed most frequently was infants in 15 patients, which corresponds to 62.5%, followed by five in preschool age (20.8%), and similarly in schoolchildren and adolescents, with 4.2%. If we consider the age of surgery, the presence of cholangitis events was found to be more frequent in infants (81.8%), while in both preschoolers and adolescents, cholangitis events did not occur. In Mexico City n = 10 or 41.7%, Querétaro and Chiapas n = 3 or 12.5% cysts were reported. The rest of the states Tlaxcala, Veracruz, Quintana Roo, Morelos, Guanajuato, Puebla, Guerrero, and Aguascalientes reported one case each.

Currently, the concern is due to the possibility that it may evolve into a cholangiocarcinoma since its prevalence increases up to 20 times in relation to the population without this pathology. For type I cyst, its relation to malignancy ranges from 2.5 to 26%, and compared with types II, III and IV its percentage in relation to malignancy transformation ranges from 10-15%, with a risk of post-surgical malignancy of 0.7%,[5,6] as well as of cholangitis and pancreatitis due to reflux of infected bile or bacteriobilia. Malignant transformation is the most serious complication, with a poor prognosis for survival with extremely unfavorable outcomes, with a reported median survival of six to 21 months.[6]

Its etiology is still a subject of discussion. In 2015, Hong-Tian Xia and his group[7] demonstrated that there may be embryological and other acquired factors, and that among the congenital ones the most accepted is the abnormality in the pancreaticobiliary junction ranging from 50 to 80%, although not all causes are due to an anatomical abnormality. Based on their study with 27 patients, it was revealed that 21 presented pancreaticobiliary reflux, and of these 21, four presented an abnormal anatomical pancreaticobiliary junction, which has shown that not only the anatomical abnormality of the biliopancreatic junction as the cause of common bile duct cysts, but also the presence of pancreaticobiliary reflux, that amylase levels may or may not be elevated and that the cause of pancreaticobiliary reflux is not completely explained, and that the only thing that explains the presence of pancreaticobiliary reflux (80% of anatomically normal patients) is the dysfunction of the sphincter of Oddi as the primary cause of choledochal cysts.

Pathophysiology of the common duct and biliopancreatic malunion. The anomaly of the pancreaticobiliary junction and pancreaticobiliary reflux have become more important in recent years, with the advance in the understanding of the pathophysiology and the contribution to bile duct cancer and pancreatitis development. The alteration of the pancreaticobiliary junction is defined as a congenital anomaly that consists of the union of the pancreatic duct and biliary tract outside the duodenal wall, forming a common and long duct (> 15 mm). In this way, the sphincter of Oddi does not fulfill its function and as there is a greater hydrostatic pressure in the pancreatic duct, it allows the reflux of pancreatic juice and bile into the biliary tract. This produces endothelial damage and epithelial hyperplasia and metaplasia, which in turn promotes the progression to carcinoma.[8]

TODANI'S CLASSIFICATION

Type I: cystic dilatation of the common bile duct, almost globally, including the cystic duct; there are three subtypes according to the fusiform or saccular shape, and the involvement at the site of convergence.

I A: cystic dilatation.
I B: focal dilatation.
I C: fusiform dilatation of the common bile duct.

Type II: choledochal diverticulum corresponding to saccular and lateral dilatations, with short and narrow neck; it is found in 2-10% of patients.

Type III: corresponds to choledochocele with dilatation of the terminal portion protruding into the duodenal lumen and is found in 1.4-5% of patients.

Type IV: a cystic dilatation that can be associated in up to 20% of patients with a cystic duct dilatation.

It has been subdivided into type IVA when there are multiple intrahepatic and extrahepatic cysts, and IVB when they are only extrahepatic.

Type V: cystic dilatations of exclusive localization in the intrahepatic biliary tract, also called Caroli's disease. When it is associated with periportal fibrosis it is known as Caroli's syndrome *(Figure 1)*.[9]

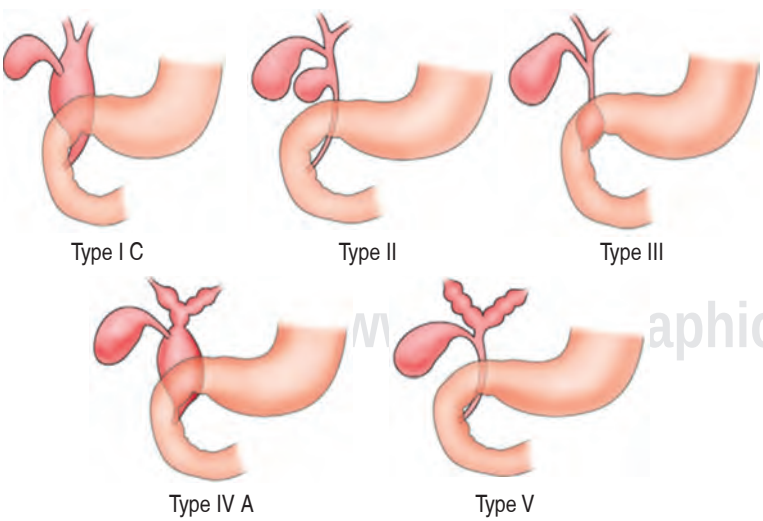

Figure 1: *Todani's classification.*

COMPLICATIONS

Postoperative morbidity and mortality are typically extremely low in children, while postoperative complications are more commonly seen in adult patients. Late complications (over 30 days postoperatively) occur in up to 40% of adult patients and include anastomotic stenosis, cancer, cholangitis, and cirrhosis. As part of the medium-term cares, close and consecutive monitoring of patients is recommended for timely interventions, if necessary.[10,11]

CASE PRESENTATION

A 26-year-old woman who began her illness in June 2002 with abdominal pain in the epigastrium and right hypochondrium after ingestion of cholecystokinetic foods, was treated then with paracetamol 500 mg orally every eight hours and butylhioscine 10 mg orally every eight hours in case of pain for a month, with temporary remission of the condition and exacerbations during her stay in the emergency room in the first hours.

Physical examination showed painful facies, conjunctival jaundice, normal lung fields, and a soft tender abdomen on palpation of the epigastrium and right hypochondrium, positive Murphy's sign, no palpable masses, no visceromegaly, and no signs of peritoneal irritation. The rest of the physical exam was normal.

Lab tests were performed with the following findings: hemoglobin 13.4 mg/dl, hematocrit 40.1%, leukocytes 8.9 × 10^3/l, platelets 234 × 10^9/l, glucose 76 mg/dl, creatinine 0.8 mg/dl, BUN 10 mg/dl, total bilirubin 4.1 mg/dl, direct bilirubin 3.6 mg/dl, indirect bilirubin 0.5 mg/dl, amylase 75 U/L, lipase 95 UI/L, AST 23 UI/L, ALT 30 UI/L, alkaline phosphatase 100 U/L, GGT 40 UI/L, and normal urinalysis.

Un ultrasonographic study of liver and biliary tract showed normal liver, proximal common bile duct of 7 mm, dilated distal common bile duct of 27 mm with microliths inside, with an appearance suggesting a common bile duct cyst, gallbladder measuring 82 × 37 mm with a wall thickness

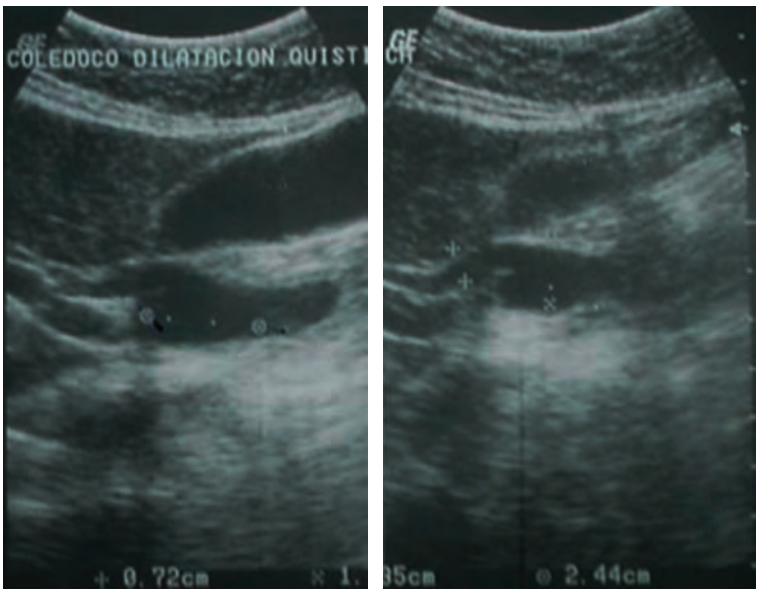

Figure 2: *Liver and biliary tract ultrasonography study, with report of common bile duct cyst with microliths inside.*

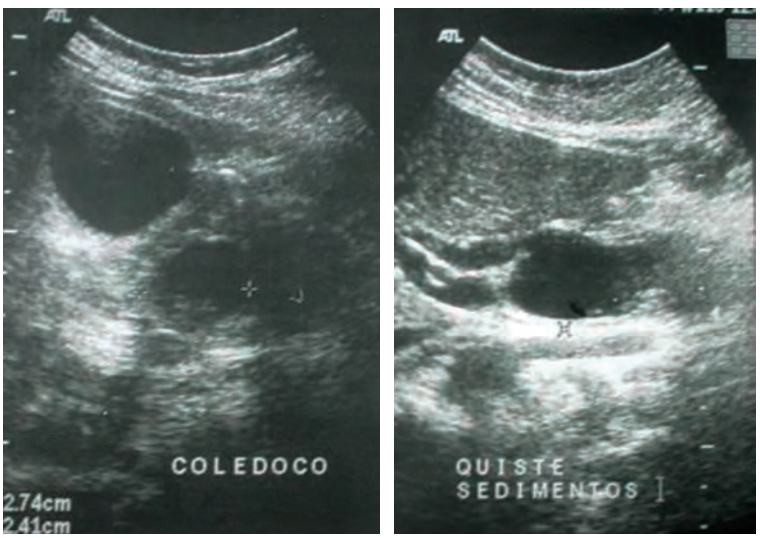

Figure 3: *Another ultrasonographic study taken as outpatient showing a normal liver and anechoic gallbladder, measuring approximately 6.3 × 3.1 cm, with a 4 mm wall and the presence of a common bile duct cyst in the distal region measuring 1.35 × 2.4 × 0.72 cm.*

of 2 mm without stones in its interior, and pancreas, kidneys, and spleen normal. The ultrasound diagnostic impression was that a common bile duct cyst with microliths inside *(Figure 2)*.

Given the patient's indecision to accept further studies and surgical management, she was discharged after four days of hospital stay and care as outpatient. An endoscopic retrograde cholangiopancreatography (ERCP) and a new ultrasound of the liver and biliary tract were requested, as well as laboratory tests, liver function tests (LFTs), blood cell count, blood chemistry, and coagulation studies that revealed an increase of total bilirubin in 4. 0 mg/dl at the expense of direct bilirubin with 3.6 mg/dl. The rest of the lab results were normal. Conservative management was offered to the patient, and since there was no surgical emergency, a protocol for surgical treatment of the common bile duct cyst was initiated at the outpatient clinic.

Another ultrasonographic study was performed as an outpatient that showed a normal liver, an anechoic gallbladder measuring approximately 6.3 × 3.1 cm with a thickness wall of 4 mm, and the presence of a common bile duct cyst in the distal region measuring 1.35 × 2.4 × 0.72 cm *(Figure 3)*. The common bile duct was of normal caliber in its proximal segment with well-delimited edges without significant compression of neighboring organs.

After her informed consent was obtained and preoperative surgical protocol was completed, an endoscopic retrograde cholangiopancreatography was programmed, as it is the resource available in our institution, with the following report.

Endoscopic retrograde cholangiopancreatography: a fusiform cystic dilatation of the distal common bile duct of 2.8 cm in its widest portion that begins 1.6 cm below the confluence of the hepatic ducts at the level of the cystic junction was seen, extending for 4.8 cm, and ending in a segment of a narrow common bile duct that is insufficient to empty the cyst. The gallbladder was partially opacified, and the common hepatic duct, the carina, and both right and left hepatic ducts had normal diameter and configuration; the intrahepatic biliary tract was normal *(Figure 4)*.

Diagnostic impression: the preoperative diagnosis was that of a fusiform solitary common bile duct cyst type I (Todani's classification). Once the preoperative protocol

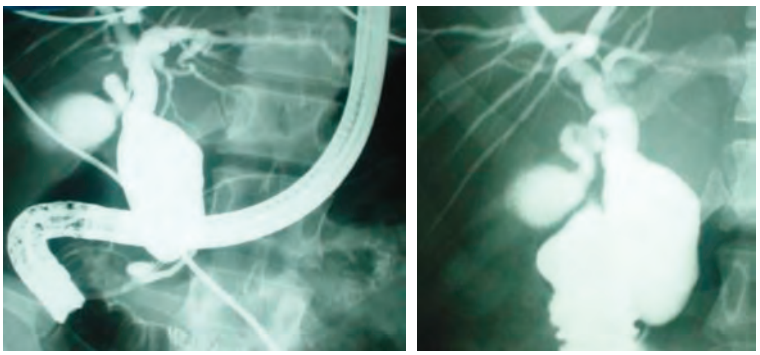

Figure 4: *Fusiform cystic dilatation of the distal common bile duct measuring 2.8 cm in its widest portion, starting 1.6 cm below the confluence of the hepatic ducts at the level of the cystic junction, extending over a length of 4.8 cm. At its distal portion it ends in a segment of a narrow common bile duct that is insufficient to empty the cyst.*

was completed and the anatomy of the cyst was defined, as well as its classification and relationship with adjacent structures, elective surgery was performed.

Under mixed anesthetic block, after asepsis and antisepsis of the region, sterile fields were placed and a right subcostal incision was made. The dissection was performed by planes until reaching the abdominal cavity. The gallbladder was identified, and dissection of the cystic and its artery was started. Then the gallbladder was dissected in an anterograde way until reaching its union with the common bile duct; the common bile duct was dissected along the cyst. The bleeding vessels were clamped, cut and ligated with 2-0 silk suture, then the proximal portion of the common bile duct was sectioned and dissected until reaching its distal portion, which was clamped, cut and ligated. Then the jejunum was sectioned approximately 40 cm from the Treitz ligament, and an end-to-side anastomosis was performed in two planes with a 3-0 Vicryl and a 2-0 silk sutures at 70 cm from the loop that goes towards the common hepatic duct. Then, a hepato-jejunal anastomosis was performed with 3-0 prolene sutures in one plane *(Figure 5)*.

Operative findings: a common bile duct cyst of approximately 6 × 4 cm, gallbladder without stones was found, and the liver was of normal appearance *(Figures 6 and 7)*.

Postoperative evolution was satisfactory, starting oral administration on the fourth day and the patient was discharged on the seventh day after surgery.

At present, her excellent evolution and her general good condition is corroborated, as well as her reintegration to her work and social roles through outpatient control with USG and laboratory tests.

DISCUSSION

Choledochal cysts are mostly diagnosed in childhood or adolescence, and only 20-30% occur in adults. It is an exceedingly rare pathology in our setting, the most frequent symptoms being abdominal pain in the right hypochondrium and jaundice. Adults usually present a less florid clinical picture, which leads to a late diagnosis. The therapeutic approach to biliary cysts depends on the type of cyst.

Within the protocol for the management of common bile duct cyst, it must be classified by

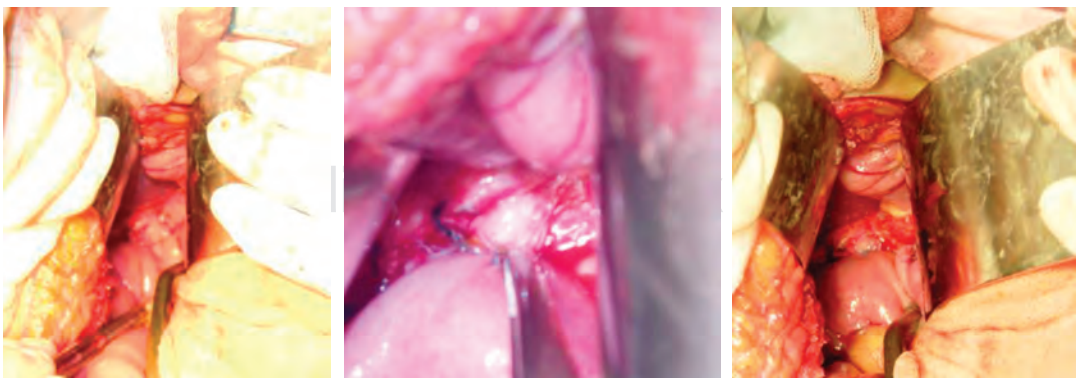

Figure 5: *Roux-en-Y hepato-enteroanastomosis. Procedure development.*

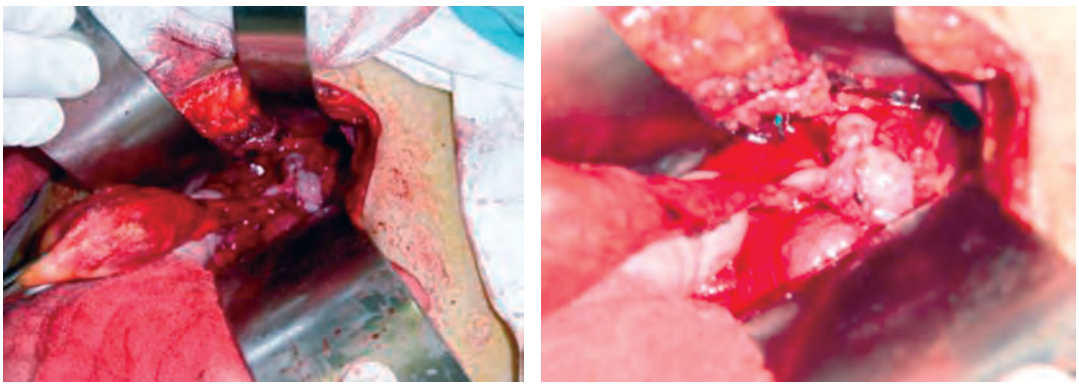

Figure 6: *Removal of gallbladder and common bile duct cyst.*

means of imaging studies, of which magnetic resonance (MR)-cholangiography is the one of choice. Since MR-cholangiography was not available at our institution, ERCP was used in this case, which allows identification of the cyst anatomy and planning of surgical management,[12] consisting of complete resection of the cyst plus Roux-en-Y hepato-entero-anastomosis, which can currently be performed laparoscopically.[13-15]

In our case, an open cholecystectomy and Roux-en-Y hepato-entero-anastomosis were performed satisfactorily. These procedures were done due to the lack of equipment and thanks to the experience in biliodigestive derivations in our unit, obtaining favorable results with the patient. The patient was seen one month, six months and one year later, with lab control including liver function tests. All the results were within normal parameters. The patient continues to carry out his daily activities.

Figure 7: *Common bile duct cyst measuring approximately 6 × 4 cm, gallbladder without stones, and liver of normal appearance.*

The prognosis for patients with cholangiocarcinoma originating from a common bile duct cyst is grim, with a reported median survival of six to 21 months. The poor prognosis of patients with cholangiocarcinoma is mainly because the tumor is diagnosed in late stages; in the studies carried out by Xiao-dong et al,[7] patients with cholangiocarcinoma were detected in early stages, and they had a better prognosis in patients with stages Ia, Ib, and IIa of cholangiocarcinoma diagnosis, having achieved 90.4, 40.0 and 25.15% five-year survival, respectively.

CONCLUSION

Overall, choledochal cyst resection has an excellent prognosis, with 89% event-free and a total of five-year survival. The prognosis for the patient with cholangiocarcinoma arising from a common bile duct cyst is dismal, with a reported median survival of six to 21 months. The poor prognosis of patients with cholangiocarcinoma was mainly attributed to the late stage of the tumors at diagnosis. Malignancy was rarely observed in patients with cysts removed in childhood, but the risk of malignant transformation increases with age. This risk is less than 1% if the choledochal cyst appears before the age of 10 years but increases to 14% after 20 years of age.

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Massive lower intestinal bleeding due to GIST in a Meckel's diverticulum

Sangrado digestivo bajo masivo por tumor de GIST en un divertículo de Meckel

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Keywords: Meckel's diverticulum, gastrointestinal bleeding, hypovolemic shock, gastrointestinal stromal tumor.

Palabras clave: *Divertículo de Meckel, sangrado gastrointestinal, choque hipovolémico, tumor del estroma gastrointestinal.*

ABSTRACT

The presence of tumors in Meckel's diverticula is rare. Most of them are benign, but among the malignant ones we may find adenocarcinomas, sarcomas, and carcinoids. Also, the presence of gastrointestinal stromal tumors (GIST), which can be benign or malignant, has been reported. We were motivated to this work by the clinical presentation of a GIST in a Meckel's diverticulum with severe lower gastrointestinal bleeding and hypovolemia, which led to an urgent surgical intervention. **Case report:** We present the case of a 42-year-old woman with severe lower gastrointestinal bleeding and hypovolemic shock; she underwent emergency surgery because the cause of the bleeding was a gastrointestinal stromal tumor in a Meckel's diverticulum. Surgical treatment consisted of intestinal resection with oncologic limits. Histopathological study confirmed the presence of the malignant tumor. **Conclusions:** The presence of a gastrointestinal stromal tumor in a Meckel's diverticulum, although rare, has been reported in the medical literature, but not the clinical presentation of a GIST in a Meckel's diverticulum with severe hemorrhage leading to hypovolemic shock.

RESUMEN

La presencia de tumores en los divertículos de Meckel es poco frecuente. La mayoría es benigna, pero entre los malignos encontramos adenocarcinomas, sarcomas y carcinoides. También, ha sido informada la presencia de tumores del estroma gastrointestinal (GIST), los cuales pueden ser benignos o malignos. Nos motivó a este trabajo la presentación clínica de un GIST en un divertículo de Meckel con una hemorragia digestiva baja severa e hipovolemia, la cual provocó una intervención quirúrgica urgente. ***Caso clínico:*** *Se presenta el caso de una mujer de 42 años con hemorragia digestiva baja severa y choque hipovolémico; ella fue operada de urgencia, porque la causa del sangrado era un tumor del estroma gastrointestinal en un divertículo de Meckel. El tratamiento quirúrgico consistió en una resección intestinal con límites oncológicos. El estudio histopatológico confirmó la presencia del tumor maligno.* ***Conclusiones:*** *La presencia de un tumor del estroma gastrointestinal en un divertículo de Meckel, aunque es poco frecuente, ha sido informada en la literatura médica, pero no la presentación clínica de un GIST en un divertículo de Meckel con una hemorragia severa que conduce a un choque hipovolémico.*

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INTRODUCTION

The presence of Meckel's diverticulum was first mentioned in 1598 by Guillelmus Fabricius Hildanus or Fabricius von Hilden or Fabricius Hildamus, who is considered the "father of German surgery". In 1671, Lavater also reported this same finding, but the most complete description was made by Johann Friedrich Meckel in 1809.[1]

Meckel's diverticulum is associated with another congenital abnormality (tracheoesophageal fistula) in 30% of cases. It is located between 30 and 100 cm at the antimesenteric border of the terminal ileum.[1,2] Cases have been reported up to 180 cm from the ileocecal valve, although this varies according to age; in children it is located on average 30-35 cm from the ileocecal valve

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and in adults 60-80 cm. It measures between 1-8 cm and has an incidence of 1-4% with a higher frequency in males.[2] In 50% of cases there is gastric heterotopic tissue; other tissues found have been pancreatic, duodenal, jejunal, colonic, hepatobiliary, and endometrial tissue. Symptoms are related to hemorrhage, obstruction, diverticulitis, perforation and tumors.[1,3]

Lower gastrointestinal bleeding is more frequent in children under two years of age; it presents with heterotopic gastric tissue, which exhibits peptic ulcers in the mucosal transition from the diverticulum to the ileum. In 55% of the cases, this presentation occurs in children under 18 years of age.[1,4,5] The frequency of a tumor in a diverticulum ranges from 0.5-3.2%; if they are benign, they present as leiomyomas, angiomas and lipomas, but if they are malignant, carcinoids, adenocarcinomas, sarcomas, and gastrointestinal stromal tumor (GIST) may be found. The latter occurs in 12% of cases.[4-6]

GIST is a subepithelial tumor that was previously classified as mesenchymal tumor (previous nomenclature), such as leiomyoma, nerve sheath tumor, schwannoma, and lipoma, even, these can be benign or behave as malignant. Some characteristics of malignancy are mucosal or epithelial involvement, i.e., ulceration, hemorrhage, and presence of clots. Of all cases of GIST, 30 to 35% are found in the small intestine. Foreign bodies such as enteroliths and gallstones have also been described in Meckel's diverticula. The clinical presentation of a GIST in a Meckel's diverticulum with massive lower gastrointestinal bleeding and hypovolemic shock -which led to urgent surgical intervention- is exceedingly rare.

CLINICAL CASE

The case of a 42-year-old woman with a history of constipation is presented. She was admitted to the "Comandante Manuel Fajardo" University Hospital in Havana, Cuba for presenting with bloody, wine-colored stools. Her blood pressure was 110/70 mmHg with a heart rate of 105 per minute. On rectal examination, the rectal ampulla was found to be occupied by stool, and the glove was stained with dark pasty stool and with the presence of clots. Volume replacement was started with colloid and crystalloid solutions. The following complementary analyses were performed:

Hemoglobin: 9 g/dl, hematocrit 28%.
Blood group: O negative.
Upper endoscopy: erosive edematous gastritis with no signs of bleeding.
Abdominal ultrasound: a segment of a loop dilated located in the right lower quadrant with concentric thickening of the walls suggestive of inflammatory process was seen.

Less than an hour later, the patient presented a bleeding of more than 1,000 ml. She appeared was pale, sweating, and her body temperature was cold. She reported "dark vision"; her mucous membranes were also pale. She had a heart rate of 130 beats per minute, a blood pressure of 90/60 mmHg, and a respiratory rate of 24 per minute.

It was discussed as a group and it was concluded that this was a patient with a negative blood group, who presented an active lower gastrointestinal bleeding of great severity with signs of hypovolemic shock. Based on these criteria and the results of the complementary tests, emergency surgery was decided. The preoperative diagnosis was massive lower gastrointestinal bleeding due to possible Meckel's diverticulum with heterotopic gastric mucosa. An exploratory laparotomy was performed using an infraumbilical median incision.

The intraoperative finding was a small bowel tumor located 90 cm from the ileocecal valve measuring 15 centimeters in height and a diameter of 10 centimeters at the tip *(Figure 1)*. Surgical resection of the affected segment was performed with an oncologic margin on both sides. A continuous extra-mucosal end-to-end anastomosis was also performed in one plane using Vicryl suture 00. There were no lymphadenopathies in the mesentery; the rest of the intestine and abdominal organs were seen as normal. Two units of red blood cells were transfused in the operating room. There were no complications, and the patient was discharged from the hospital on the sixth day.

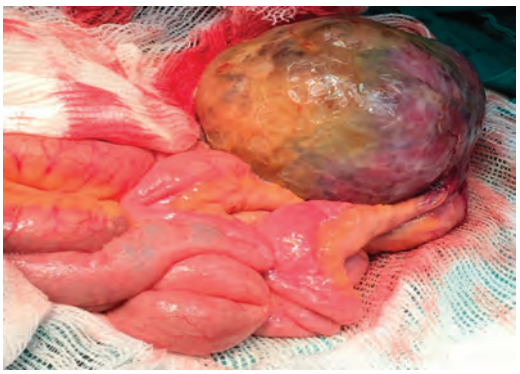

Figure 1: *Tumor in a Meckel's diverticulum 90 cm from the ileocecal valve.*

The pathological anatomy was as follows:

- Macroscopic examination of the surgical specimen: segment of small intestine (ileum) 16 centimeters long, surgical limits of 7 centimeters on each side of the tumor. The tumor reached a main diameter of 10 cm.
- Histopathology examination: GIST, weakly positive. Actin negative (meaning negative for leiomyoma or leiomyosarcoma). Tumor cells positive in 30%. Mitosis grade of less than 5 per 50 fields.
- Conclusion: GIST in a Meckel's diverticulum.

Despite being a localized and intermediate risk disease (size between 5-10 cm and mitosis of less than 5 per 50 fields of higher magnification), it was decided to give adjuvant treatment with tyrosine kinase inhibitors (imatinib mesylate). The indicated dose was 400 mg every 24 hours orally for three years; 12 months after surgical resection, the patient was free of oncologic disease.

DISCUSSION

GIST (gastrointestinal stromal tumor) is a term introduced by Mazur and Clark in 1983; it is identified as the most common mesenchymal tumors of the digestive tract and represents 0.1-1% of malignant tumors. In order of frequency, it affects the stomach (60-70%), small intestine (20-30%), rectum (3%), colon (2%), and esophagus (1%). It is seen more infrequently in the appendix, gallbladder, omentum, mesentery, peritoneum, liver, pancreas, ovaries, uterus, retroperitoneum, and in paravaginal and periprostatic tissues.[7,8] In most patients they occur between 50 and 80 years of age, being more frequent in male patients. Our case is different since it occurred in a young woman.

Because their growth is usually extraluminal and their consistency is soft, these tumors do not produce intestinal transit obstruction, so they are asymptomatic at the onset of the disease.[6,8] Symptoms appear in tumors larger than 5 cm. The clinical presentation varies according to the anatomical location of the tumor, its size, and degree of malignancy. The most common symptom is mild abdominal pain that worsens later. Other symptoms are nausea, vomiting, anorexia, weight loss, presence of a palpable abdominal mass, weight loss, hemorrhage, tumor perforation, and peritonitis.

Gastrointestinal bleeding can be acute (melena or hematemesis), occult, or chronic producing anemia, due to ulceration of endoluminal growth tumors. In our patient the lower gastrointestinal bleeding was of great severity leading to hypovolemic shock. This was probably caused by its location in a Meckel's diverticulum. When reviewing the literature, no similar case combining both elements was found. The presence of mesenteric nutritional vessels crossing the ileum to distribute themselves in the tumor mass -which was observed in the case presented- is characteristic of malignant tumors of the small intestine *(Figure 2)*.

Meckel's diverticulum is seen on a computerized tomographic (CT) scan as a cul-de-sac image, usually with fluid, air or particulate material. On an ultrasound study, in patients with bleeding, a hyperechogenic tubular structure like a cyst is usually seen.[2,4,5] In the case presented, the ultrasound performed assisted in a possible preoperative diagnosis.

Treatment of GIST depends on the extent and prognosis of the disease. This is based on the risk classification described in 2002 by C.D. Fletcher,[9] according to the size of the primary tumor and its mitosis rate. This is distributed as follows:

- Very low risk: less than 2 cm, mitotic rate less than 5 per 50 fields of higher magnification.
- Low risk: between 2-5 cm, and mitotic rate less than 5 per 50 fields of higher magnification.
- Intermediate risk: size less than 5 cm, mitoses 6-10 per 50 fields of higher magnification, or size between 5-10 cm and mitoses less than 5 per 50 fields of higher magnification.
- High risk: larger than 5 cm and mitosis rate less than 5 per 50 fields of high power, or 10 or more cm and any mitotic rate, or any size and mitoses of more than 10 per 50 fields of higher magnification.

Other factors would be histologic subtypes, the degree of cellular pleomorphism, and the patient's age. For a well localized tumor at low risk, surgical resection would be sufficient. However, for the rest of the tumors, adjuvant treatment is recommended to prevent the action of the KIT receptor, as well as to stop cell division and prevent dissemination.[7-11] Although in our case it was a localized malignant disease without extension to other organs and a local surgical resection was performed with a good oncologic margin (2 centimeters accepted) and a low rate of proven mitosis, it was a bulky tumor, which was diagnosed during a complication (digestive bleeding). Consequently, it was classified as high risk due to its size, so adjuvant therapy with imatinib mesylate administration was decided. The good evolution of the case accredited this decision.

Figure 2: *The mesenteric nutritional vessels crossing the ileum towards the tumor are observed.*

CONCLUSION

The presence of a GIST in a Meckel's diverticulum, although rare, has been reported in the medical literature, but not in a Meckel's diverticulum with severe lower gastrointestinal bleeding and hypovolemic shock. Timely diagnosis with radical surgical-oncologic treatment without the presentation of postoperative complications, complemented with adjuvant treatment with imatinib mesylate has allowed a recurrence-free survival.

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Hereditary colorectal cancer: synchronous presentation of colorectal cancer and cholangiocarcinoma in a patient with familial adenomatous polyposis

Cáncer colorrectal hereditario: presentación sincrónica de cáncer colorrectal y colangiocarcinoma en un paciente con poliposis adenomatosa familiar

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Keywords: Familial adenomatous polyposis, Lynch syndrome, hereditary colorectal cancer.

Palabras clave: *Poliposis adenomatosa familiar, síndrome de Lynch, cáncer colorrectal hereditario.*

ABSTRACT

Gastrointestinal polyposis syndromes are characterized by the presence of multiple polyps in the gastrointestinal tract preferentially affecting the colon and rectum. They account for about 5% of colorectal cancers, the most common being familial adenomatous polyposis and hereditary non-polyposis colon cancer (Lynch syndrome). They are a group of diseases of low incidence with variable characteristics that require a correct individualization for their most appropriate treatment. Within the genetic syndromes there are presentations with typical molecular variations that typecast the most frequent groups; however, there is the possibility that these syndromes show genetic similarities whose predominance determines the evolution and presentation of the disease.

RESUMEN

Los síndromes de poliposis gastrointestinales se caracterizan por la presencia de múltiples pólipos en el tubo digestivo que afectan preferentemente el colon y recto. Representan alrededor de 5% de los tipos de cáncer colorrectal, siendo los más comunes la poliposis adenomatosa familiar y el cáncer de colon no polipósico hereditario (síndrome de Lynch). Son un grupo de enfermedades de escasa incidencia con características muy variadas que precisan una correcta individualización para su tratamiento más adecuado. Dentro de los síndromes genéticos hay presentaciones con variaciones moleculares típicas que encasillan a los grupos más frecuentes; sin embargo, existe la posibilidad de que dichos síndromes muestren similitudes genéticas cuya predominancia determine la evolución y presentación de la enfermedad.

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INTRODUCTION

Worldwide, colorectal cancer (CRC) represents the third most common malignancy and the fourth leading cause of cancer-related mortality, with recognized familial syndromes accounting for about 5% of cases.[1,2] There are two broad classes of hereditary colorectal cancer, depending on the predominant location of the cancer: distal and proximal. Familial adenomatous polyposis (FAP) and most sporadic cases can be considered a paradigm for the distal class, whereas hereditary nonpolyposis colorectal cancer

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(Lynch syndrome) more clearly represents the proximal class.[3,4]

PAF is an autosomal dominant syndrome caused by a germline mutation of the adenomatous polyposis coli gene.[5] It affects 1:10,000 people and accounts for approximately 1% of colorectal cancer. Its main characteristic is the appearance of more than 100 colorectal adenomatous polyps, which can number in the thousands, starting at a young age, with a cancer risk close to 100% if not treated promptly. Most cases begin as benign adenomatous colonic adenomatous polyps.[2,6,7]

The complexity of the possible clinical presentations of these syndromes includes, in addition to severe or attenuated colorectal disorders, various extracolonic manifestations such as gastric and duodenal polyposis and desmoid tumors, which may require additional endoscopic or surgical treatment that complicates the therapeutic process and imposes continuous surveillance even when the colorectal disease is eradicated.[8]

CASE PRESENTATION

The patient is a 56-year-old man under medical treatment for long-standing arterial hypertension and ischemic heart disease treated with coronary stent placement two years ago, with a hereditary family history of colon cancer in two first-degree relatives under 50 years of age. He came for external evaluation due to a history of three months of evolution with lower gastrointestinal tract bleeding (LGITB) accompanied by anemic syndrome; a colonoscopy was performed, and multiple polyposis was observed (more than 200 polyps), with neoplastic lesions in the sigmoid colon and transverse colon *(Figure 1)*. No abnormal skin or bone lesions were found, nor was the presence of hypertrophy of the retinal epithelium pigment identified.

The study was complemented with an endoscopy of the upper gastrointestinal tract showing a diffuse micronodular surface in the upper portion of the body of the stomach, without duodenal polyps *(Figure 2)*, and a thoracoabdominal computerized tomography (CT) scab with IV contrast revealed a transverse colon tumor with peri-colonic fat infiltration conditioning partial obstruction, as well as the presence of para-aortic lymphadenopathies *(Figure 3)*. Laboratory studies showed hemoglobin: 9.0 g/dl, total protein: 5.8 g/dl, albumin: 3.0 g/dl and carcinoembryonic antigen: 131 ng/ml.

During the second day of hospitalization, the LGITB persisted with a decrease in hemoglobin to 7.0 g/dl. An intestinal occlusion was diagnosed, so it was decided to schedule surgery.

Total colectomy with terminal ileostomy was performed by hand-assisted four-port laparoscopy, finding multiple peritoneal and hepatic implants, of which biopsies were taken. Postoperatively, the patient developed adynamic ileus that resolved after 18 days

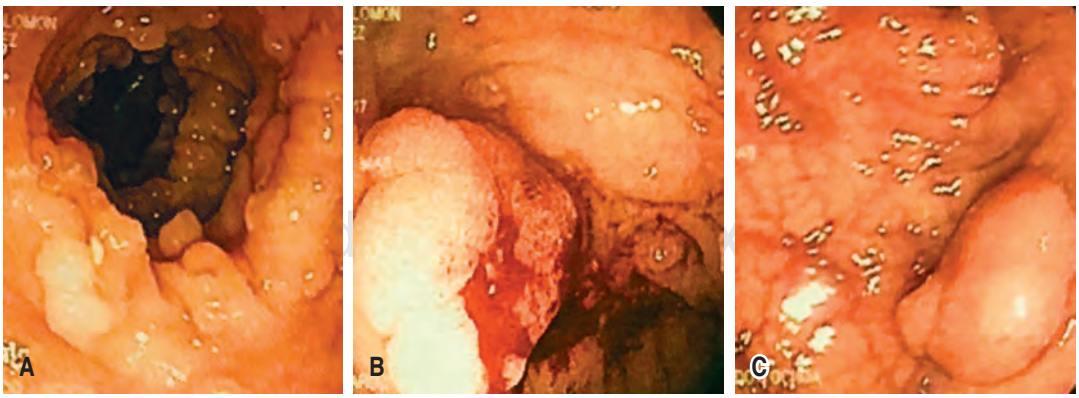

Figure 1: *Colonoscopy showing multiple polyposis* ***(A)****, with neoplastic lesions in the transverse colon* ***(B)*** *and in sigmoid colon* ***(C)****.*

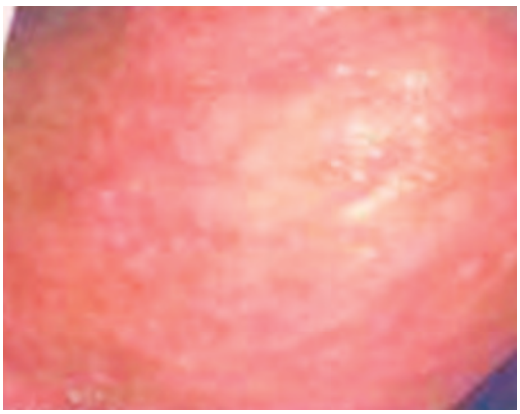

Figure 2: *Endoscopy image: diffuse micronodular surface in the upper portion of the body of the stomach, without duodenal polyps.*

with parenteral nutrition. Later, the patient tolerated the oral route. He was discharged with a functional ileostomy, after placement of a Port-a-Cath catheter.

The pathology department reported more than 200 tubular adenomatous polyps with low-grade dysplasia, as well as the presence of intestinal adenocarcinoma with mucinous component in the transverse and sigmoid colon. Liver biopsy revealed type I cholangiocarcinoma (CCA). Immunohistochemistry panel was performed for microsatellite instability with the following findings: MLHI, MSH2, MSH6 and PMS2 with conserved nuclear expression, and loss of nuclear expression of the APC gene, negative molecular test for identification of KRAS gene mutation, with CK7 (+), CK9 (+) and CK20 (-) in liver biopsy, suggesting FAP associated with primary cholangiocarcinoma *(Figure 4)*.

The patient was readmitted for adjuvant FOLFOX + bevacizumab-based chemotherapy administration in six cycles, with good tolerance. He is currently asymptomatic.

DISCUSSION

Most CRCs develop from benign preneoplastic lesions: adenomatous polyps or adenomas. Vogelstein proposed a multistep model of carcinogenesis for the development of CRC that describes the progression from a benign adenoma to a malignant carcinoma through a series of well-defined histological stages, known as the adenoma-carcinoma sequence model. Accordingly, it is understood that the etiology of CRC is multifactorial and is likely to involve the actions of genes at multiple levels, among which p53, APC, transforming growth factor (TGF)-β, SMAD, MLH1, MSH2, MSH6, PMS2, AXIN, STK11, PTEN, DCC and KRAS have been implicated.[9]

In 1991 the gene responsible for FAP, called Adenomatous Polyposis Coli or APC gene, was discovered.[10] More than 300 different mutations have been discovered in this gene that can cause this type of polyposis *(Annex 1)*. It was been shown that the risk of developing specific manifestations of FAP, as well as the severity of the disease in the large intestine are related to the type of genetic

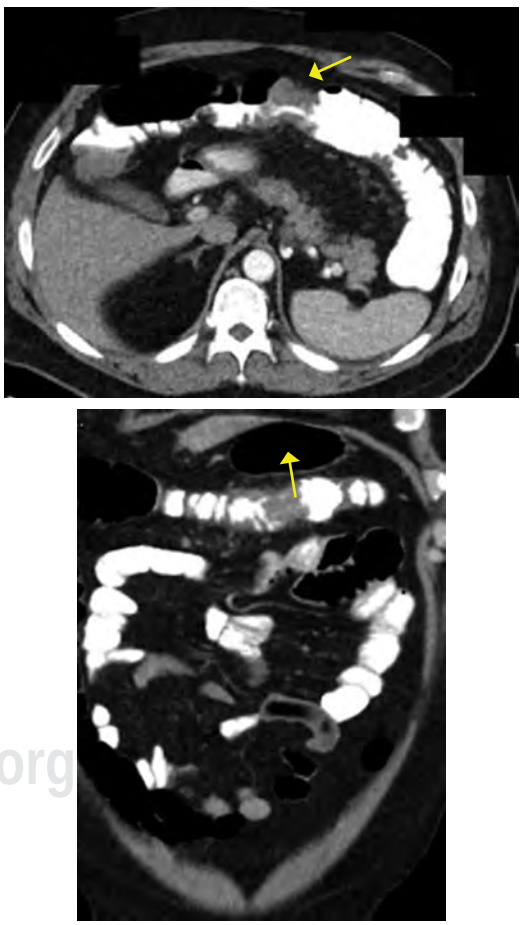

Figure 3: *Partially occlusive transverse colon tumor (yellow arrow).*

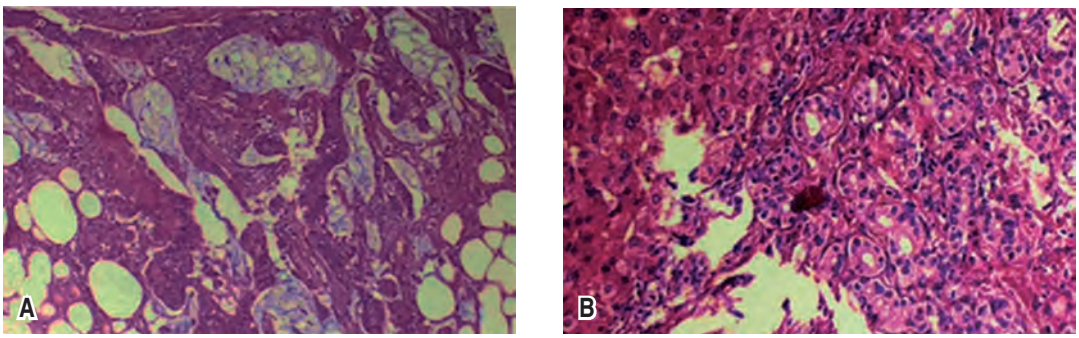

Figure 4: ***(A)*** *Muco-secretory colonic adenocarcinoma with signet ring cells,* ***(B)*** *well-differentiated hepatic adenocarcinoma.*

mutation. The most severe are most frequently observed in mutations between codons 1250 and 1464. This implies an early onset with symptoms (abdominal pain, diarrhea, blood in the stool) even before the age of 20 years, a high number of polyps in the colon and rectum, and an early progression to malignancy. Although clinically proven, FAP has no recognizable genetic mutation. There are many extracolonic manifestations of FAP, including osteomas, epidermoid cysts, desmoid tumors, gastroduodenal involvement, congenital hypertrophy of the pigmented epithelium of the retina, among others.[11]

The management of this type of hereditary diseases or syndromes should start with genetic counseling to inform about the type of pathology, the best therapy, and the necessary follow-up, thus reducing the morbimortality attributable to these syndromes. Prevention will be aided by specific identification of the causative germline mutation in the patient's family, which classifies the risk and sets the tone for the therapeutic and surveillance plan. Currently, prophylactic surgery is mandatory; however, the type of surgical technique will depend on the severity of the manifestations and the genotype presented.[12,13]

CCA is a malignant tumor arising from the biliary epithelium anywhere in the bile duct system, from the bile ducts to the ampulla of Vater. It is often associated with inactivation of tumor suppressor genes, e.g., p53, SMAD4, Bcl-2 and p16. Mutations in oncogenes, including KRAS, p53, c-ErbB-2 and c-Neu, have also been described. Although mutations may lead to detectable phenotypic changes, molecular profiles in biliary cytology currently have no established diagnostic or prognostic role.[14]

Distinguishing intrahepatic CCA from metastatic adenocarcinoma and other primary liver tumors can be difficult. Differentiation requires gastrointestinal tract metastases that often cannot be performed by histology. Other modalities, especially imaging, are essential. Immunohistochemistry panels including CK7, CK19, CK20, CDX-2, TTF-1, estrogen/progesterone receptors and prostatic specific antigen (PSA) may be useful, depending on the clinical context. CCAs are usually CK7 positive and CK20 negative,[15,16] as was found in our patient.

Currently there are no specific serum markers for bile duct neoplasms in healthy patients or carriers of genetic polymorphisms. There are promising studies of markers such as different mucins, interleukin-6, sialic acid, and matrix metalloproteinases used in combination, but more research is needed.[17]

The ideal gold standard for preventing complications or delaying the development of colorectal cancer would be a genetic technique that allows the deletion of the diseased gene and the implantation of a disease-free gene. Currently, this remains pure speculation. Most of the research deals with systems for screening for germline mutations in the adenomatous polyposis coli gene that predispose to susceptibility and disease in familial adenomatous polyposis. Today there are technical systems that detect mutations

in the APC gene, which could be useful in the molecular diagnosis of pre-symptomatic cases in families with FAP;[18] however, there are other interesting ways to approach the problem of pre-symptomatic carrier risk assessment in familial adenomatous polyposis such as the combined use of molecular markers and biomarkers, with a detailed understanding of the process of carcinogenesis being necessary.[19]

CONCLUSION

Familial adenomatous polyposis may not be considered a single disease entity with standard guidelines for surgical treatment. However, prophylactic colectomy after the manifestation of polyps, but before the development of colorectal cancer, remains the most effective preventive measure. Nowadays, refinement genetic analysis techniques and new targeted therapies with the possibility of identifying the mutation carried by the patient (whether it is related to a severe phenotype or not) have assumed a fundamental role in the indication of the type of surgical treatment in terms of radicality. Some bioinformatics tools aim to predict the sensitivity of the tumor to drugs based on its molecular characteristic, as well as in the short and long-term follow-up of both the patient and his first-degree relatives, have been developed.[20,21]

Surgical options are proctocolectomy with end ileostomy, subtotal colectomy with ileorectal anastomosis and restorative proctocolectomy with ileoanal reservoir. The decision should be based on the estimation of the risk of colorectal cancer, so that patients at high risk such as those with more than 20 adenomas in the rectum, more than 1,000 adenomas in the colon, rectal adenomas larger than 3 cm in diameter or with severe dysplasia, or in patients with a confirmed diagnosis of colon or rectal cancer, restorative proctocolectomy with ileoanal pouch could be the procedure of choice.[22]

The application of various intermediate biomarkers to chemoprevention studies increases the ability of investigators to analyze the effects of new chemo-preventive agents in the colon and other organs.

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Annex 1: Main characteristics of allelic heterogeneity of mutations in Adenomatous Polyposis Coli, Lynch Syndrome and Neoplasia associated with chronic non-specific ulcerative colitis (CNSUC).

	FAP	AFAP/HFAS	HNPCC/Lynch	UCAN
Mean age at diagnosis of colorectal cancer	32-39	45-55	42-49	40-70
Distribution of cancer	Random	Mainly right colon	Mainly right colon	Mainly left colon
No. of polyps	> 100	1-100	1 (i.e., tumor)	
Sex ratio (male:female)	1:1	1:1	1.5:1	1:1
Endoscopic view of polyp	Pedunculated	Mainly flat	Pedunculated (45%); flat (55%)	None
Lag time (years) from early adenoma to occurrence of cancer	10-20	10	5	?<8
Proportion (%) of colonic cancer	1	0.5	1-5	< 0.5
Superficial physical stigmata	80% have retinal pigmentation None	None	Only in Muir-Torre syndrome	None
Distribution of polyps	Distal colon or universal	Main proximal to splenic with rectal sparing	Mainly proximal to splenic flexure	None
Carcinoma histology	More exophytic growth	Non-exophytic but very variable	Inflammation increased mucin	Mucosal ulceration and inflammation
Other associated tumors	Duodenal adenoma cerebral and thyroid tumors, medulloblastoma and desmoids	Duodenal adenoma	Endometrial ovarian, gastric cancer, glioblastoma, many other cancers	
Gene (chromosome) mutation	APC (5q 21) distal to 5	APC (5q 21) proximal to 5	MHS2 (2p), MLH1 (3p21), PMS1 (2q31), PMS2 (7p22)	Multiple mutations, 17p (p53), 5q (APC), 9p (p16)

FAP = familial adenomatosis polyposis coli; AFAP = attenuated familial adenomatous polyposis coli; HFAS = hereditary flat adenoma syndrome; HNPPC = hereditary non-polyposis colon cancer; UCAN = ulcerative colitis associated neoplasia.
From: Al-Sukhni W, Aronson M, Gallinger S. Hereditary colorectal cancer syndromes: familial adenomatous polyposis and lynch syndrome. Surg Clin North Am. 2008; 88: 819-8 44, vii. doi: 10.1016/j.suc.2008.04.012.

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Surgery as a public health problem in Mexico and the concept of global surgery

La cirugía como problema de salud pública en México y el concepto de cirugía global

Antonio Ramos-De la Medina,* Juan Roberto Torres-Cisneros‡

Health is a fundamental right recognized by the United Nations General Assembly in 1966 and by Article 4 of the Political Constitution of the United Mexican States.

The role that accesses to health services plays in human development cannot be overlooked and those societies that guarantee this access through well-established systems have better levels of development and quality of life. "Global health" is one of the major issues of this century. In many countries, even those with well-developed and strong economies, there are groups with limited access to medical care.[1,2] Diseases that require surgical care for their management account for about 30% of the global burden of disease.[3] However, despite the magnitude of surgical diseases in the context of global health, surgery had not been considered as a relevant public health issue. It is estimated that currently almost 2/3 of the world's population does not have access to safe surgical and anesthetic care.[4,5] The poorest third of the world's population receives 3.5% of the surgical interventions performed each year.[6] This imbalance in the volume of surgery in low- and middle-income countries demonstrates that surgery remains "the forgotten stepchild of global health".[7]

In recent years, several initiatives have been developed to focus on this problem. One of the most widespread has been the Lancet Commission on Global Surgery (LCoGS) led by John G. Meara of Harvard Medical School, Andy Leather of King's College London and Lars Hagander of Lund University, who together with a group of commissioners, representatives of professional associations, governments, non-governmental organizations and academics from 110 countries generated a report entitled *Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development*[4] in which five key messages are postulated:

1. 5 billion people lack access to safe, affordable. and timely surgery and anesthesia.
2. 143 million additional surgical procedures are needed each year to save lives and prevent disability.
3. Every year 33 million people face catastrophic expenses due to paying for surgery and anesthesia.
4. Investment in surgical and anesthesia services is affordable, saves lives, and promotes economic growth.
5. Surgery is an indivisible and indispensable part of healthcare.

In addition, this report establishes six indicators that need to be measured to assess the current strength of a surgical system, the preparedness of a country to provide safe surgical care, and the state of protection against financial risk. The indicators are:

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1. Timely access to essential surgery: proportion of the population in each country that can access, in less than two hours, to a facility where cesarean sections, laparotomies and repairs of exposed fractures can be performed (Bellwether procedures).
2. Surgical specialist workforce density: number of surgical, anesthesia and obstetrics (SAO) physicians working in each country per 100,000 population. The goal is to have at least 20 specialists per 100,000 population.
3. Surgical volume: number of procedures performed in an operating room per 100,000 inhabitants per year in each country. The goal is a surgical volume of 5,000 procedures per 100,000 inhabitants.
4. Perioperative mortality rate: number of in-hospital deaths from any cause in patients who have undergone a procedure performed in an operating room, divided by the total number of procedures, presented as a percentage.

5 and 6. Risk of impoverishing expenditures and risk of catastrophic expenditures for surgical care: the probability of experiencing impoverishment (using a threshold of $1.25 per day, PPP) when surgical care is required and the probability of suffering catastrophic expenditures (10% of total income) when surgical care is required.

The LCoGS aims to implement these indicators and achieve the goals in 80% of the countries by 2020 and in 100% of the countries by 2030.

In Mexico there are multiple public health programs aimed at addressing the needs of the most vulnerable population, most of which are prevention, access and early detection, and care of infectious or chronic degenerative diseases. However, as in the rest of the world, surgery as a public health problem has received less attention in the country. Although, since the implementation of the so-called *Seguro Popular* in 2003, coverage and financial protection improved, there are still challenges and financial barriers to provide the necessary services. In a study on access to health care in Mexico, Gutiérrez et al. concluded that 48% of the population still does not have effective access to health services in the country, either due to lack of financial protection (54.3%) or due to limitations and barriers to access to care such as lack of quality in hospitals or geographic availability (45.7%).[8]

Mexico does not have a robust health information system with which to measure the state of surgical care. Based on some indicators proposed by the LCoGS commission, we find that the workforce density of surgical specialists is 40.2 per 100,000 inhabitants, being the double of the target suggested by the commission and slightly above the average for high-income countries. However, the surgical volume is estimated at 1,335 procedures per 100,000 population, which is well below the target of 5,000 procedures.[9] This information is disturbing and although there is a known underreporting due to the fragmentation of the health system, this may, on the other hand, indicate low productivity or difficulties of access to surgical care. The perioperative mortality rate was analyzed in a recent study, which found that the national mean mortality rate is 0.28 for cesarean section (range 0-0.95 per state), 4.64 for cholecystectomy (range 0.73-12.42 per state), 3.03 for appendectomy (range 0-9.55 per state) and 3.78 for inguinal hernia (range 0-12.64 per state). These figures are comparable to those of high-income countries, but it should be noted that they do not include data from the private sector.[10]

With respect to financial protection and the risk of impoverishing and catastrophic expenses, Shrime and his team developed a stochastic model to estimate the risk, incorporating the income distribution for each country analyzed, the probability of requiring surgery, and the medical and non-medical costs associated with care. In this analysis, the risk of incurring impoverishing and catastrophic spending for the general population was estimated at 54.5 and 27.8% respectively, while for the poorest population in Mexico it was estimated at 100 and 64.3% respectively.[11] Towards the end of 2019, the Mexican government decided to cancel *Seguro Popular* and implement the *Instituto de Salud para el Bienestar* (INSABI) and recentralize health services for the non-salaried population. This new attempt to

offer universal health care in Mexico came into operation at the beginning of 2020 and its rules of operation and financing schemes are still not well known, nor is it known what it contemplates regarding access to essential, safe, and affordable surgery.

These numbers and background highlight the importance of focusing on the surgical capacity and care needs of the population and the area of opportunity that exists for surgical care to acquire a relevant role in the country's public health.

Another innovative initiative is the collaboration between the UK's National Institute for Health Research Unit on Global Surgery (NHIR GSU) and GlobalSurg, an international network of surgical researchers interested in global surgical issues and part of the Surgical Gateway Research Foundation, a UK charity. The aim of GlobalSurg is to foster local, regional, and international integration and collaboration of surgical networks to participate in the development of global studies based on a collaborative model of peer-to-peer partnership previously published in Lancet and lays the foundation to be able to have a national registry to carry out similar projects in each country.[12] The main lines of research aim to generate indicators of quality and risk in general surgery. In November 2018 in Veracruz, Mexico, with the support of the universities of Birmingham, Edinburgh, and Warwick, as well as funding and logistical coordination by the NIHR GSU, the Global Surgery Research Center was integrated and has participated in multiple research projects coordinated by GlobalSurg and NIHR GSU, which have shown that mortality and risk of surgical site infection in high-income countries is lower than in middle and low-income countries.[13]

It is important that in the Mexican Association of General Surgery we become aware of the prevailing inequity in the surgical care of the population and join to participate actively in this type of initiatives. The responsibility of government authorities is to ensure that there is adequate infrastructure, political and economic stability, sufficient human resources, and financial protection systems.

It is imperative to dispel the notion that providing surgical care as part of other basic public health measures is too costly and complex. Improving access, quality, and safety of surgery for the population should not be considered a charity entrusted to philanthropic organizations on an intermittent basis because it is a fundamental right, a principle of justice and social responsibility regardless of countries and ideologies. Surgery is an essential component of universal health and must be addressed with a holistic approach to offer comprehensive solutions.

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Memories of a general surgical service and its surgeons. Part 1

Memorias de un servicio de cirugía general y de sus cirujanos. Parte 1

David Olvera Pérez*

Keywords:
General surgery, chronology, surgeons, social security.

Palabras clave:
Cirugía general, cronología, cirujanos, seguridad social.

ABSTRACT

This is a chronology of the General Surgery Service and the general surgeons of the General Hospital of the IMSS National Medical Center (1963-1981), a hospital that disappeared with the 1985 earthquake and that, without a doubt, was an important part of the history of General Surgery in Mexico. In these articles we honor and pay tribute to our teachers who forged us and gave us professional life. I hope that many surgeons will send similar memories to our journal to enrich our cultural heritage of Surgeons and General Surgery in Mexico.

RESUMEN

Esta es una cronología del Servicio de Cirugía General y de los cirujanos generales del Hospital General del Centro Médico Nacional del IMSS (1963-1981), hospital que desapareció con el sismo de 1985 y que, sin duda alguna, formó parte importante de la historia de la Cirugía General en México. En estos artículos honramos y homenajeamos a nuestros maestros que nos forjaron y dieron vida profesional. Tengo la esperanza que muchos cirujanos envíen a nuestra revista memorias semejantes para enriquecer nuestro acervo cultural de Cirujanos y Cirugía General en México.

History, emulation of time, repository of actions, witness of the past, example and notice of the present, warning of the future.
Miguel de Cervantes

Manuel Quijano Narezo and most of the notable and eminent surgeons of the original General Surgery Service have passed away. Undoubtedly, they deserve to be remembered and honored for their personal and "team" work, which forged an important part of general surgery in Mexico.

PRESENTATION

In this historical description –one could say, novelistic– of the General Surgery Service and of the surgeons who participated in the beginnings of the General Hospital of the National Medical Center of the Mexican Social Security Institute (HG of the CMN of the IMSS), I have allowed myself to remember an important part of my professional training, which I gladly share with all general surgeons and which, of course, I would live again with. Because, as the phrase goes, "to remember is to live".

Emotions come together when trying to write down memories with the utmost veracity; there is almost always the risk of omitting something, as memory fails. For the same reason, I apologize for the involuntary omissions and for the lack of information that prevents me from being more accurate in this description.

Recently, after the passing of some surgeons that we will describe below, I was present at academic events that lacked well-deserved posthumous words for them. The leaders at that time did not consider doing so, probably because they were not aware of the historical value of their actions and what they did to improve general surgery in Mexico, that which led us to be what we are today. History in war

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and politics is written by the victors, but in real life, only those who witness it know it; this is one of them.

Henry Sigerist insisted that the history of medicine can be a useful mediator between ancient humanism and modern science, an idea that seems almost forgotten today. During his lecture in Leipzig, Sigerist placed the history of medicine within a larger cultural context and called for a research program.[1]

To know what happened and why it happened, I must go back to the origins of the facts, which, indisputably, undergo changes by man, by the need to improve circumstances. Furthermore, according to the historian Enrique Flores-Cano, it is a way of teaching the diversity of human beings and their creativity in their social development.[2]

The purpose of this story is to describe, but above all, to pay tribute to the physicians and surgeons who forged us. As a surgeon of the General Surgery Service of the General Hospital of the CMN of the IMSS where I participated during those years, it is remarkably interesting to recall the historical evolution of a general surgery service that, in its time, was a leader in attendance and academic production for congresses, avant-garde in many surgical pathologies and in the training of surgeons. Sharing these historical facts of general surgery, I believe, will allow us to know each other better, to understand our surgical past and to prepare ourselves better for the future.

My time at the HG of the CMN of the IMSS was relatively short, only four years as a resident and seven years as a surgeon. Although, undoubtedly, the most important thing was to be there in the best years of productivity, development, academic research, and recognition.

Once again, through this story, I thank each one of those who participated in my professional training, because I am indebted to them. During my stay, I received preparation like many fellow residents, but very few of us had the opportunity to collaborate professionally in that advanced medical care center and to receive praise –in my case, undeserved– for their hard work during the first 10 years.

Cicero said that "history is testimony of time, light of truth, life of memory, teacher of life, reflection of antiquity".[3] Through these lines, I invite all general surgeons in Mexico to send reviews and biographies of their teachers, so that the annals of the Mexican Association of General Surgery may be enriched with this information and, at the same time, so that new generations may better understand and know the evolution of general surgery in Mexico.

To improve the quality of the subject and its description, I invited Dr. Rafael Alvarez Cordero, a brilliant surgeon, and an outstanding writer, who lived and actively participated with his professional work in these stories. I would like to take this opportunity to thank him for his time.

ORIGIN

On October 15, 1943, the President of the Mexican Republic, General Manuel Avila-Camacho, issued an agreement to unify the Health and Public Assistance Services. At that time, the acting secretary was Dr. Gustavo Baz-Prada, who assumed that great responsibility; in this way, with the objective of avoiding duplicity and unnecessary expense, he sought greater coordination to achieve sufficient efficiency and increased hospital coverage throughout the Mexican Republic. I will tell you more about this later.

At that time, it was said that taking care of the health of the Mexican people was taking care of the health of the Nation itself, since only by improving the health of those who work could a healthy and strong Nation be built. To this day, those words are still valid.

The Ministry of Health and Assistance initiated a study to formulate and execute a project for the construction of hospital institutions, whose objective was to substantially improve medical care services for the population, considering that the old hospitals were hardly adaptable to function in accordance with the modern advances in medicine at that time. Thus, more than 200 hospitals, both large and small, were built throughout the length and breadth of our country and made up the figure that has gone down in history in terms of construction by a single health administration.[4]

Beyond the universal context, undoubtedly, that generation of politicians and health administrators were great characters. Their thinking went beyond the ordinary; they wanted institutions over time, such as Social Security, to grow and develop. Only then could the calculations of the capacity of the Ministry of Health of that environment be considered from another point of view but, when that happened, the hospitals undertaken would be at the level of quality of any hospital built by other institutions and organizations. And so, it happened in the field of health care.

But going back to the forties, the hospital network planned by the *Secretaría de Salubridad y Asistencia* (Ministry of Health and Assistance) had a special construction in mind for the country's capital, a large and complete medical center (unthinkable for its time), which would be superior to many existing ones and equal to others. When Dr. Baz was Minister of Health and Assistance (September 3, 1945) and a year before the end of his term, the law that created the Committee for the Projection and Construction of the Medical Center of Mexico was issued. Its objectives were to assist the population of the Federal District (Mexico's Capital city) and surrounding areas, with the most advanced medical advances of its time, reduce costs and improve social assistance. This law included the building of 12 large hospitals with modern equipment and technology that would cover all branches of medicine. It would be called the "Magna Ciudad de la Salud" (Great City of Health).

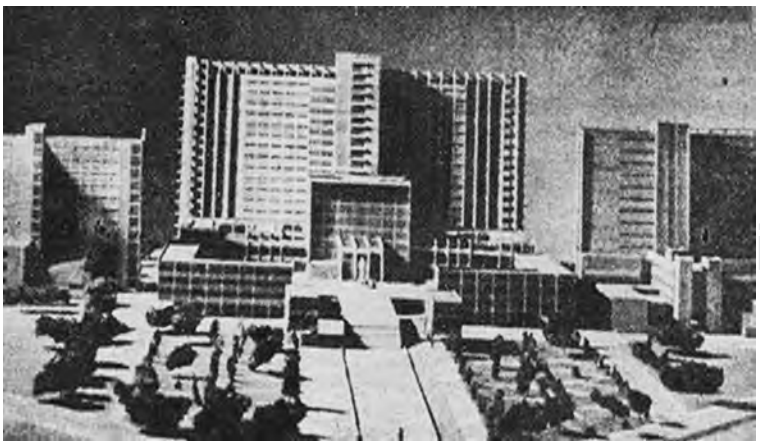

Figure 1: *Model of three of the main facilities of the "Magna Ciudad de la Salud".*

Figures 1 and 2 date back to 1945. In the first one, it is a model of three of the main establishments of the Medical Center of Mexico City. And in the second one, it is a composition in which the traffic circle of Cuauhtémoc Avenue can be observed (I do not know if it existed), and what would be several hospitals. At that time, the Hospital del Niño (Children Hospital), and the *Instituto de Cardiología* (National Cardiology Institute) had been finished, and three more hospitals were under construction.

The XXI Century National Medical Center of the Mexican Social Security Institute has a long history, dating back to the first half of the 19th century. Within its multiple hospitals, and within the walls of those hospitals, surely, there is a great variety of medical and patient histories, including those of the hospitals themselves. Throughout this memory, we will recount the origin and end of a general surgical service that existed at the General Hospital of the National Medical Center of the Mexican Social Security Institute.

INCEPTION AND EVOLUTION

On March 15, 1963, the President of Mexico, Mr. Adolfo López-Mateos, inaugurated the National Medical Center of the Mexican Social Security Institute (IMSS). At the inauguration he solemnly mentioned that the IMSS was celebrating its twentieth anniversary and that it would be memorable for bringing health and wellness to the country's workers *(Figure 3)*.[5]

On December 1, 1958, Mr. Benito Coquet had been appointed director of the Mexican Social Security Institute by President Adolfo López-Mateos. During the first fortnight of his administration, he submitted for the consideration of the President of the Republic the names of the persons he would propose to the Technical Council of the Institute. Thus, Dr. Luis Méndez was appointed as Deputy General Medical Director; likewise, Dr. Bernardo Sepúlveda accepted the position of Head of the Department of Planning and Organization of Medical Services.

Figure 2: *In this photographic composition, the Children's Hospital and the Institute of Cardiology were already completed, and what would be several medical institutions that would make up the "Magna Ciudad de la Salud".*

Figure 3: *Inauguration of the National Medical Center by Mr. Adolfo López-Mateos, president of Mexico.*

Mr. Benito Coquet wrote at that time:

The beginning of the activities of the *Instituto Mexicano del Seguro Social*, almost simultaneously with the planning and construction of the Medical Center, seemed to link, from its origins, one and the other. However, the Mexican Institute of Social Security (IMSS) was born as a decentralized organism of the state, and the Medical Center was projected as a dependency of the then newly created Ministry of Health and Assistance. Almost 19 years after the construction of the Medical Center began, the IMSS acquired by alienation what had been built until then and finished the construction of the different units that integrated it. The last one was the Medical-Surgical Hospital (which was finally identified as the General Hospital of the National Medical Center of the Mexican Institute of Social Security), and was finished and put into service on March 15, 1963.

So much for the words of Mr. B. Coquet [sic].

And as Mr. B. Coquet mentions, it did happen. History will point out what the Medical Center meant for the working population and for the advancement of medicine. For almost 25 years, it was an institution of which the country could be proud: it fulfilled a task for the good of Mexico and Mexicans. Furthermore, it was undoubtedly beautiful from an architectural point of view. It was a hospital complex whose labor, welfare, and academic attributes, gained during its existence, allowed it to boast of being the most important in Mexico and, probably, in Latin America.

In the commemorative book of the inauguration, in the first chapter dedicated to the General Hospital, it is striking that in the list of medical specialties installed in that unit, the General Surgery Service does not appear. However, this absence has an explanation. General surgery was considered in Mexico as a large appendix of gastroenterology (I do not know the origin of this condition and I think it that had no reason to be, since, for example, surgical services in European countries have always been considered independent). Bernardo Sepulveda, as head of the Department of Planning and Organization of Medical Services of the IMSS, appointed Dr. Luis Landa-Verdugo as a Chief of the Gastroenterology Service of the HG of the CMN of the IMSS. Both came from the *Hospital de Enfermedades de la Nutrición*, now known as the *Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán"*, where the

General Surgery Service was attached to the Gastroenterology Service, so they adopted and installed that model of assistance and teaching, which persists to date.

The General Hospital of the CMN of the IMSS began its activities that same month of March of its inauguration (1963) *(Figures 4 and 5)*. Thus, Dr. Gustavo Baz-Díaz Lombardo was the first General Surgeon who showed up and immediately started surgical activities. Dr. Francisco-Hidalgo Castro arrived as a Surgical Resident, already with a surgical training (incomplete?) from the Hospital of Nutrition Diseases. Dr. Jorge Bautista-O'Farrill joined in May, and three months after Dr. Hidalgo's arrival, Dr. Rafael Alvarez-Cordero was added as the second resident. And Dr. Vicente Guarner-Dalias joined the team in August of the same year.

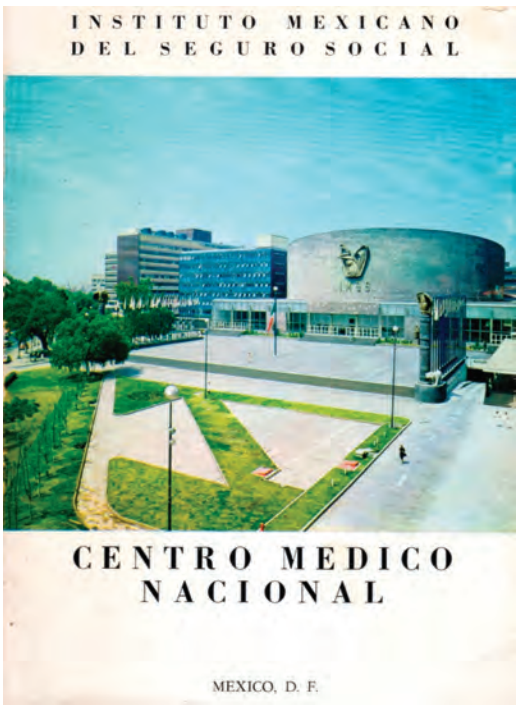

Figure 4: *CMN main front plaza.*

Figure 5: *Final view of the IMSS CMN.*

According to Dr. Felix Ramirez Espinosa, an excellent former President of the Angiology Service, and a lover of his specialty origins, he mentioned that the General Surgery residency was an important pillar in the development of the General Hospital. This was the first surgical residency in that hospital, and therefore, it provided medical support to all the specialties that required it.[6]

The first months were of great surgical intensity. As has been reported, Dr. Baz practically lived in the hospital, since he operated in the morning, afternoon, and night shifts. Thus, the legend was born that in one weekend shift he operated on 38 patients, a record that was never surpassed by subsequent generations, including me (with a limit of 28 surgeries and that, unlike me, I had greater support with more residents). The first surgical teams were integrated, on the one hand, by Dr. Gustavo Baz-Díaz Lombardo and Dr. Francisco Hidalgo and, on the other hand, by Dr. Jorge Bautista-O'Farrill with Dr. Rafael Álvarez-Cordero.

In the following year, Dr. Francisco Hidalgo was incorporated as an attending surgeon, and Dr. Isauro Durán-Llamas and Dr. Carlos Godínez-Oropeza started the surgical residency.

Dr. Manuel Quijano-Narezo was invited to collaborate in the IMSS because of his prestige, being at that time one of the best surgeons in Mexico, who during the first two years served as director, but was appointed as assistant director. In addition to his professional prestige, he was endorsed for having performed, at the proposal of Dr. Jorge Bautista-O'Farril, the elective cholecystectomy of the Mexican President wife's, Gustavo Díaz Ordaz. Dr. Rafael Alvarez-

Cordero was fortunate to have participated in that surgery.

Dr. Quijano was trained as a surgeon at the General Hospital of Mexico and was a surgeon at the Hospital of Nutrition Diseases. He was appointed as Director of the General Hospital of the CMN of the IMSS, and was Head of General Surgery service also, but accepted the medical-surgical system with the coordination of the Gastroenterology Service. At this stage, the academic and assistance activities were founded.

When Dr. Luis Landa began his leadership with iron discipline, he transmitted his responsibility in assistance, dedication to academia and invitation to research. At the beginning, the Gastroenterology Service occupied the entire seventh floor of the General Hospital, which had a T-shaped architectural conformation, so the north wing was occupied by male patients and the south wing by female patients. In the east-west segment were the Outpatient Services, the Clinical Research Laboratory, and the Biochemistry, Bacteriology and Amebiasis labs. The Endoscopy Service at that time was managed by Dr. José Ramírez-Degollado, a great pioneer in this field. By 1964, due to the great demand of gastroenterological patients, the hospitalization area was doubled so the sixth floor was integrated, reaching 100 beds.

According to this distribution of patients, there was a gastroenterologist and a surgeon for each section, so that Dr. Alfonso Perches and Dr. Jorge Bautista formed a single team. Dr. Antonio de León and Dr. Gustavo Baz-Díaz Lombardo formed another pair, as well as doctors Luis F. Cervantes and Vicente Guarner, and doctors Enrique Segovia and Francisco Hidalgo. And the rotation took place every year. For each of these sections, the 2nd, 3rd, and 4th year residents of General Surgery were added, as well as the Residents of Medical Gastroenterology specialty.

The organization continued and by 1967, when Dr. Carlos Godínez finished his residency, he was accepted as an attending physician. At that time there were already four surgeons in the morning shift, and with him the afternoon and night shifts were completed, which started at 4 p.m. and ended at 8 a.m. the following day; Dr. Rafael Alvarez-Cordero, Dr. Carlos Godinez-Oropeza and Dr. Raul Gomez-Garza were the pioneers of this service. This is how it worked until 1972, when Dr. Gustavo Baz-Díaz Lombardo resigned to found and initiate the Health System of Ciudad Nezahualcóyotl of the State of Mexico. Dr. Carlos Godinez occupied the morning shift, and Dr. Luis Ize-Lamache, by then resident of the 3rd year bis (that was the name given to the fourth year of General Surgery residency) and Chief Resident, occupied the on-call shift. That same year, Dr. Ize was awarded a scholarship to attend the 1st Parenteral Nutrition Course in the United States of America, so upon his return he devoted himself to initiate the Parenteral Nutrition Service (and his night duty shift was occupied by the undersigned of this chronology). This assignment lasted for two years.

In 1975, the reorganization of the structure of the HG CMN of the IMSS, promoted by Dr. Gilberto Flores-Izquierdo, who replaced Manuel Quijano-Narezo as the head of the hospital, appointed Dr. Rafael Alvarez-Cordero as Chief of the Surgery Division, and Dr. Jorge Bautista-O'Farrill as Chief of the General Surgery Service. This way, the pairing of gastroenterology and surgery ended and, thus, another stage in the history of surgery began.

Dr. Rodolfo Rojas-Rubí covered the on-call duty and worked for a short time in the service. He was called by the General Director of IMSS to organize the VIP (very-important people) Patient Service, where he discovered his administrative and political skills, which later led him to hold various administrative positions in the Institute of Security and Social Services for State Workers (ISSSTE) and in the Ministry of Health and Assistance (SSA). In the same year, Dr. Raul Gomez-Garza arrived to continue the work of Dr. Gustavo Baz in the Health System of Ciudad Nezahualcóyotl, and Dr. Roberto Blanco-Benavides and Dr. Gustavo Ramirez-Wiella joined the Surgery Service.

Soon after, the changes continued. Dr. Vicente Guarner replaced Dr. Rafael Alvarez-Cordero in the Surgery Division for a brief period. The latter left that position when he migrated to the "La Raza" Medical Center of the IMSS to be responsible for the General Surgery Service.

The general surgery residents who were fortunate enough to be forged in that mixed gastro-surgery service attended the joint sessions, in addition to our surgery classes. Thus, we participated in the bibliographic, radiological and pathology sessions.

Dr. Manuel Quijano-Narezo, first Director of the CMN General Hospital, wrote: "this hospital was the flagship of the National Medical Center and contributed, like no other, to give academic and professional prestige to the Mexican Institute of Social Security".[6] The participation of the Gastroenterology Service of the CMN HG of the IMSS in the national congresses of the Mexican Association of Gastroenterology was particularly important, with up to 40% of the free papers, and the same percentage in conferences, symposia, and round tables. For example, the VII National Congress of Gastroenterology held in 1971, where 20 free papers were presented out of 60 (33%), and in the IX National Congress of Gastroenterology in 1975, the number of free papers presented was 32%.

The Gastroenterology (and Surgery) Service was in force from 1963 to 1975, and during those years, its image grew both in the Republic and abroad, due to the protocols of gastrointestinal pathologies, as well as research. This is evidenced by the important number of physicians from Central and South America who acquired surgical skills in this service. The gastrointestinal topics in which the Gastroenterology Service was always at the forefront were: portal hypertension, management of peptic disease, treatment of pancreatitis (in 1980, 600 patients documented by Dr. Lopez-Fournier, who personally told me about it). The first studies of morbid obesity, treatment of complications of amebiasis, liver pathologies, and parenteral nutrition.

Changes in the hospital organization chart also occurred in the services. In 1975, the Gastro Surgery Service was disrupted and separated into General Surgery and Gastroenterology. Thus, the General Surgery Service was born at the General Hospital of the IMSS National Medical Center. Its first chief was Dr. Jorge Bautista- O'Farrill. The entire sixth floor of the hospital was assigned to General Surgery Service, with one section for female patients and the other for male patients. The surgeons who initiated this transition were Dr. Carlos Godínez-Oropeza, Dr. Luis Ize-Lamache, and Dr. David Olvera-Pérez, in the morning shift. In the afternoon, Dr. Marco Antonio Alarcón, former resident of the same service, born in Nicaragua and naturalized Mexican citizen later, used to work. At night, Dr. Roberto Blanco-Benavides, and Dr. Gustavo Ramirez-Wiella, the latter an excellent surgeon with surgical training in England, took over, so that the service was "injected" with other surgical criteria. The demand for surgical assistance continued to increase, so they soon began to collaborate in the morning shift. The fifty beds quickly became insufficient, reaching nearly 200, considering that patients from other services remained in their beds when they were operated on and were not transferred to the sixth floor or to the Convalescent Hospital. This service remained active until 1981, when the IMSS authorities, in accordance with the Almá-Atá Declaration of 1978,[7] decided to reorganize the health care services. There were only six years of activity and productivity of the General Surgery Service of the HG of the CMN of the IMSS.

Under the direction of Dr. Jorge Bautista-O'Farrill, we continued with the same academic activities, and with bibliographic, radiological, and pathological sessions, and increased the number of surgeries by implementing elective surgery in the afternoon shift. Surgical production remained at around 7,000 surgeries per year, by adding all shifts and services: morning, afternoon, and emergency service.

Following the provisions of the Almá-Atá Declaration, health services were divided into three levels of care: the first level of care, which is the closest to the population, where health care needs could be solved with health promotion activities, disease prevention, and others. At this gateway to health care, there are low complexity facilities, such as general clinics, health centers, polyclinics, and others, where approximately 85% of the most prevalent problems are solved. The second level of care included hospitals and establishments providing care in the disciplines of internal medicine, general surgery, gynecology-obstetrics, pediatrics, and psychiatry. It is considered

that, between the first and second levels, up to 95% of the population's health problems can be solved. At the third level, which deals with the less prevalent problems, complex pathologies that require special procedures and high technology, 5% of the medical/surgical problems are solved. This perfectly explains the design applied at that time. The head of the academic course of general surgery remained in the HG of the CMN of the IMSS, but the assistance service underwent an irreversible change. In the new *Hospital de Especialidades del Centro Médico Siglo XXI* there were 20 to 25 surgical beds for "third level" surgery with about 25 general surgery residents and attending physicians (I do not know the correct number). The result has been a great disappointment in the doctor-patient-academic and care-production relationship.

The General Surgery Service was transferred to second level hospitals, leaving only a special third level surgical service, a transcendental change that forced the surgeons to accept this new disposition, or else to resign. Surgeons Bautista, Godínez and Olvera chose the second option. These changes opened the doors for the arrival of surgeons trained in that hospital, and with a remarkable surgical trajectory. Dr. Andrés Proal was appointed as Chief of the third level Gastro-surgical Service together with two collaborators: Dr. José Luis Ibarrola and Dr. Luis Sigler. But, from this date on, that is another story... that ends in 1985 with the macro earthquake that hit Mexico City.

Other physicians from the Gastroenterology Service that I will always remember with great affection for their friendship and the knowledge they passed on to me are Luis F. Cervantes (†), Miguel Stoopen, Alfonso Perches, Miguel Tanimoto (†), Enrique Segovia, José Antonio Vásquez-Saavedra, Norberto Treviño-García Manzo, and Antonio de León.

Finally, I wish I could name all the general surgery residents who passed through the HG of the IMSS CMN, but the list is large, and I would probably incur in faults that could hurt susceptibilities. Many of them are famous on their own merits, some within the IMSS, and others in other institutions. For example, it is enough to point out that 30% of the presidents of the Mexican Association of General Surgery were residents of the service that concerns us today.

In the following chapters, we will present every one of the physicians and surgeons whose professional work, from 1963 to 1981, played an important role in the history we are relating. They will be presented in chronological order, because by understanding the facts, we will be able to better understand the historical evolution of the surgical service that it became.

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The narratives of surgical regulations: fact or fiction?

Las narrativas de la normatividad quirúrgica. ¿Realidad o ficción?

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ABSTRACT

The application of regulations in medicine is problematic due to ambiguities in the legal language that surgeons do not understand. The interpretation of the rules governing health systems and services generates conflicts between physicians and lawyers, especially when iatrogenesis occurs. In this essay, norms are presented as useful fictions, and normativity as narrative. The different technical, psychological, operative and control problems, some factual aspects and the anomalous adaptive behaviors adopted by surgeons to be able to move within the scope of a normativity that they do not always understand are analyzed. Several Mexican Official Norms and the World Health Organization's Surgical Safety Checklist are analyzed. The surgeon's conflict between adhering to the rules or to his/her own good judgment, between the legal and the moral, and the critical questions that must be asked to practice in a complex legal environment in which he/she no longer has the freedom of previous times, are discussed.

RESUMEN

La aplicación de la normatividad en medicina es problemática debido a ambigüedades del lenguaje legal que los cirujanos no comprenden. La interpretación de las normas que rigen los sistemas y servicios de salud genera conflictos entre médicos y abogados, sobre todo cuando se produce iatrogenia. En este ensayo se plantean las normas como ficciones útiles, y la normatividad como narrativa. Se analizan sus diferentes problemas técnicos, psicológicos, operativos, de control, algunos aspectos fácticos y las conductas adaptativas anómalas que adoptan los cirujanos para poder moverse en el ámbito de una normatividad que no siempre entienden. Se analizan varias Normas Oficiales Mexicanas y la Lista de verificación de la seguridad de la cirugía, de la Organización Mundial de la Salud. Se discute el conflicto del cirujano entre apegarse a las normas o a su buen arbitrio, entre lo legal y lo moral, y las preguntas críticas que debe hacerse para ejercer en un ambiente legal complejo en el que ya no tiene la libertad de antes.

INTRODUCTION

It is well known that one of Mexico's greatest problems is the application of the law. Although it is a principle of law that ignorance of the law does not exempt from compliance with it, laws are frequently not complied with and rights are not exercised because they are not known. According to Diego Valadés, "it is highly advisable to read the Constitution [...] The problem now is that the Constitution changes too frequently, and this prevents 'fixing a text' [and] it is not easy for them to read a multiplicity of laws and codes, which are destined to be handled by experts".[1]

The causes of iatrogenesis are multiple; they range from the ignorant to the negligent, to the cognitive. They are complex, in addition to individuals, and involve segmented and disjointed health systems and services, whether public and insufficient, or private, lucrative, and inaccessible. Ignorance of the rules can lead to iatrogenesis. In this essay I will deal with some problems and consequences of the norms that govern the practice of surgery in Mexico, considered as useful and imperfect fictions, from the point of view of their logical interconnections, the ambiguities of their language, the esoteric strangeness of the legal jargon for a surgeon who, accustomed

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to other types of texts, and sometimes due to limitations of his own language, cannot decipher them. I will also deal with anomalous adaptive behaviors in the face of a confusing normative panorama and some legal and moral consequences.

OF FLIES AND BOTTLES, THE LINGUISTIC APPROACH TO REGULATIONS

Norms, laws, guidelines, codes of ethics and other related writings are not of divine origin, they are not immutable or eternal a priori. They are human products and, as such, cannot remain static. They change, although some claim that there are immutable laws. But I am not going to deal with such rules here, but rather with those of science, technology, and medicine, which evolve with practice. A serious contemporary problem is that surgeons do not know or do not fully understand the laws and rules that govern and enforce their work, so they act on intuition, which can lead to legal entanglements. This intuition is not always reasonable, although it may seem so. According to the fragment of a poem by Rubén Bonifaz-Nuño.[2]

> How easy it would be for this fly,
> with five centimeters of flight
> reasonable, to find its way out.
>
> I could sense it long ago,
> when I was distracted by the buzzing sound
> of its clumsy flight.
>
> Since that moment I look at it,
> and it does nothing but flatten
> its eyes, with all its weight,
> against the hard glass that does not understand ...

There are judges who have learned to believe that the rule, once engraved, as on stone, will remain unchanged. But one thing is engraving, and another thing is law, which in no society is static. It is true that there are rules, uses and customs, but laws and rules that apply to sciences and techniques, such as medicine and related professions, should be updated along with the advances in these areas. Lawyers and judges must also renew themselves in what they litigate and regulate. Furthermore, due to the difficulties of what they govern, and without this being justifiable, Mexican laws and regulations contain technical ambiguities in their wording, which influence legal interpretation and entails moral difficulties. Faced with this complex scenario, judges and lawyers often memorize legal doctrine and apply it to the letter. This is a problem because, although the law is the basis for attributing responsibility and guilt, in today's dynamic and highly specialized environment, it is not always possible to operate with rigid reasoning.

Strict application of the law can exacerbate problems. For example, when a group of subjects drafts a law, "magical changes" immediately take place, invisible changes in the world that, according to an ironic but no less serious view of Enrique Cáceres, make «a subject suddenly become guilty of a crime (worse than turning him into a frog) [which] can be used to "do black magic" when it falls into the hands of pot-bellied witches with warts (moral, of course) and cause fines [or] records to appear or disappear [...] Black magic aside, if we do not use it wisely [the law] can produce counterproductive effects».[3]

One strategy that can help us is to change our mental schemes, the metaphysical approach, including the interpretation of intentions, to a linguistic approach to law. The reasons for doing so are several, not metaphysical, by the way; among them, the financial culture of health insurance, governed by the market and the (more or less) strict regulation of liabilities, which results in damage estimates and payment patterns, external but unavoidable determinants of medical practice. Thus, by analyzing the language, it is possible to dissolve some misunderstandings.

Another dipterous example, now from the Viennese Ludwig Wittgenstein, who states in his Philosophical Investigations that the goal of philosophy is "to show the fly the way out of the bottle".[4] Wittgenstein's and Bonifaz-Nuño's flies, deceived by the transparency of the glass, try to escape from their prison but bounce back inside and repeat the process. Wittgenstein, however, did not intend to give an answer to

the problem of being trapped in the bottle of language, nor to indicate how to solve it, but to ask critical questions about these problems to pose them in a more convenient way.

A well-written norm should not be complicated; its complexity would result from the regulated subject matter, such as the Mexican Official Standards (NOM), which regulate techniques and practices. Although laws and norms should form legal systems as sets of logically interconnected rules, they are often scattered or unconnected conglomerates. Now, if legal operators, who do not draft the rules, must deal with the problem of indeterminacy, ambiguity and connections between them, let us ask ourselves what happens to the simple surgeon who, if he has read them, does not understand them and therefore does not apply them.

It is well known that in Mexico good speaking and good writing are invaded by English metastases and that, in general terms, physicians read nothing but articles in that language and rehashes of journalists with awfully bad syntax. Contemporary journalism suffers from what some call infodemia, the infection by an overabundance of insubstantial information and unverified rumors, contagion from some agency from which they drink and replicate notes with jaundiced headlines, altering the syntactic sequence, "the way in which words and the groups they form to express meanings are combined." (Cf. 'syntax' in the *Diccionario de la lengua española*, 23rd ed, electronic version 23.3, 2019 update.) Afterwards, one only says "we regret the mistake" when the inoculation has already happened. Physicians are not immune to infodemia either. The problem is serious, it jeopardizes the understanding of an ambiguous and little-known legal framework, as well as that physician, who acts with the best good faith and the worst limitation of the language itself.

TECHNICAL ISSUES

A normative system is a set of statements (codes, laws, decrees) that can be of different types, descriptive (saying what something is like), declarative (affirming or denying something, or communicating an idea) or prescriptive (expressing an order or a command). It is a set of linguistic propositions with a purpose, among which there is some cohesion, and from whose interaction of meanings the total meaning of the text is constituted. For law as a system, statements are neither true nor false, but they imply linguistic actions, such as ordering or suggesting. Thus, an action can be interpreted as permitted or prohibited, due or undue, optional, or obligatory.

The problem of interpretation of the law is a legacy of the School of Exegesis, consolidated in France at the beginning of the 19th century with the publication of Napoleon's Civil Code in 1804, and the idea that judges should abide by the letter of the law, the rule for the rule itself, above other approaches. According to this school, the law is the product of the will of the legislator, so that there was no interest in the legal text itself, nor in its linguistic elements, but in the intention of the legislator, what he expressed in the so-called "spirit of the law", what he "*wanted to say*", what his purpose was and what needs he was looking to satisfy. The exegetical school and its style of thought were introduced in Mexico in the mid-19th century with the first attempts at codification of Mexican law, among which the efforts of Antonio López de Santa Anna, Maximiliano de Habsburgo and Benito Juárez, who provided greater legitimacy to the restoration of the republic with the promulgation of the Federal Code of 1870, stand out.[5] The characteristic of this style is that it has kept its language formalism static, so that the ordinances have, if not a completely archaic vocabulary, an old syntax, not very suitable for the current understanding of those who are accustomed to hyper-short texts and without grammatical connectors.

Another way of understanding the norm, less subjective than the *spirit* of the law or what someone *meant*, is to analyze its different possible constructions by analyzing the concrete forms of the arguments. According to the German jurist and legal philosopher Robert Alexy, these can be *semantic*, when they are used to justify, criticize, or show that an interpretation is admissible. One has a *genetic* argument when one interprets the intention, the correspondence of the rule, its "direct object", with the will of the legislator.

One speaks of a *historical* argument when adduces "facts that refer to the history of the legal problem discussed as to reasons in favor or against an interpretation", if a solution to the problem discussed has already been practiced, if it had consequences, etc. This is the case of the so-called jurisprudences, or when norms that evolve and replace other norms are analyzed. *Comparative* arguments refer to changes in states of affairs in a society, such as, for example, laws on legal abortion. These arguments usually require "numerous empirical premises". *Systematic* arguments refer to the logical relationship of a norm with other norms and principles, such as the interoperability of NOMs and their interactions. Finally, there are *teleological* arguments, which deal with ends and means, as well as concepts of will, intention and practical necessity.[6] We have seen that an action can be interpreted as permitted or prohibited, due or improper, and optional, or obligatory. In the latter case, the qualifying verb of the action is key to its understanding. Confusions in the use and interpretation of these verbs are very frequent. 'Shall do' implies mandatory. 'Shall do' implies choice between alternatives. If not carefully examined, the way in which normative actions are qualified can cause problems of interpretation that will have legal and moral consequences.

I propose, as a first example, two Mexican Official Norms (NOM), NOM 001 SSA3 2012 and its update, NOM-001-SSA3-2018 *Health education, for the organization and operation of medical residencies in establishments for medical care*. The former states that "for the optimal development of the medical residency, the tenured professor must have the collaboration of adjunct, auxiliary, external guest, assistant or other [sic] professors according to the existing nomenclature in the medical unit receiving residents" (italics are mine) but does not stipulate what the obligations of such professors are. The update states that "the full professor (no longer must) may count on the collaboration of assistant professors, assistant professors, guests [...] other persons who *may support* him/jer [sic] for such purpose" (italics are mine), but the meaning of 'may support him' is left undetermined, since neither the type of support nor the conditions are specified (neither "guests" nor "other persons"). The norm evolves from mandatory to the power of choice between collaborating or not of the hypothetical assistant professors of the national medical residency program. It would seem, then, that compliance with the National Health Education Program for the organization and operation of medical residencies is optional.[7]

As a second example, let us look at the problems of the interaction between underdetermination in medicine and indeterminacy and ambiguity in the language of the norms by analyzing NOM 041 SSA2 2002 and its update, NOM 041 SSA2 2011 *For the prevention, diagnosis, treatment, control, and epidemiological surveillance of breast cancer*. In them, the recommendation changes from "annually or every two years, to women between 40 and 49 years of age, with two or more risk factors and annually to all women 50 years of age or older" to "*in apparently healthy women* between 40 and 69 years of age, every two years", and both NOMs contain, as a catchphrase, the expression "by medical indication".[8]

Under such discretion, let us ask what the written norm is for. Any surgeon can justify his actions with another very convenient catchphrase, that of "adhering to standards", thus exempting himself from thinking and pretending to relieve himself of individual responsibility for any iatrogenic errors. Expressions such as "for medical indication" and "adhering to standards" can lead from free will to the physician's discretion, and even to unsuspected regions, as I discovered in the discussion of the work entitled *From evidence-based medicine to practical guidelines, to the clinic. An epistemological* confrontation,[9] which I presented at the symposium Medicine, truth and validity at the UNAM in 2016, when a physician among the attendees opined that, when in doubt, it was better to err on the side of excess and do a mammogram every 6 months... and in response to my reply about the evolution of radiographic images or the understanding of the factors that influence the speed of growth of tumors, another one seconded him with the same argument, to perform a mammogram every 6 months because, when in doubt, action is more justified

than abstention. This made me propose to my interlocutors the possibility of a study on the effects of prophylactic semiannual radiotherapy in the treatment of mammographic alterations which, in view of their silence, I thought it unnecessary to undertake.

The activation conditions, the elements that determine that the norms are applied to the social reality, imply, by their very nature, problems. One of them is the issuer (the State, the Constituent, the working committees of the institutions, etc.) and its impersonal quality, who drafts them, so that responsibilities cannot be established. Another problem is the promulgation, the external expression of the law or norm by means of language, and the quality and clarity of this language. From these two elements we can analyze to what extent laws, NOMs or clinical practice guidelines (CPGs) each constitute a coherent system and to what extent they have kind of stable logical relationships. The uncertainty of science and practice is compounded by the vagueness and ambiguity of some legal terms. Several contradictions arise from this. A first contradiction is the operability between norms and the logical principle called non-contradiction, for example, between the Federal Law on Transparency and Access to Public Information, Official Gazette of the Federation (DOF) of May 9, 2016, reformed on January 27, 2017, and the Law on Protection of Personal Data in Possession of Individuals, DOF of July 5, 2010, drafted by different issuers.

The second contradiction is that the surgeon must exercise his good judgment, his good will to interpret the norms, within the straitjacket of the rules themselves, whose purpose is to avoid the arbitrariness of the one who has to abide by it, not so of the one who has to apply it, the legal operator. The written law is constrained to the worldview of the person who drafts it, without the latter seeing either the social context or the effects of the rule he writes. Therefore, it is possible for a good intention to end up in a bad legal product. Another person, in a different circumstance, will have to intuit what the legislator "meant", so that there would be as many interpretations as there are possible exegetes. Now, if the surgeon has a limited language, if the laws are written with that rhetoric common in official documents in Mexico, with a syntax of learned and elegant 19th century pretension, then we have a bad normative function. Both must interpret and fill the gaps in the system, but one has the legal power and the other does not.

Finally, a third, philosophical contradiction is that of *normative realism* and its effects in the world. For example, according to Jacobo Choy, when there is a shortage, it is common practice to manipulate the electronic file with the intention to solve the problem.[10] The modification of the file produces a change in the *legal reality*, but not in the facts, just in reality itself. Let us now look at this normative realism that violates the principle of non-contradiction. The question of whether the norms change the reality of the world admits an answer and its opposite. The answer is no, because the factual problem persists, and yes, because anomalous adaptive conducts are produced in such a way that adapt the factual reality to the legal reality, whose purpose is to avoid liability, legal or administrative consequences.

A THOUGHT EXPERIMENT: NORMATIVITY AS NARRATIVE

Let us consider a normative system as a narrative in which the set of its enunciations forms a story of utopian and, therefore, fictitious events, throughout a hypothetical and unknown space and time, carried out by imaginary actors when the norms are written, but real ones when they are applied. In that sense, the norm is a prolepsis, it anticipates future events. Let us also say that the narrator (the legislator) is omniscient, who constructs his normative system for every possible world, and that the protagonist (the surgeon) is deficient, since he does not know what obstacles he will overcome along the way, in which there are secondary characters who modify his actions. We could therefore say that, as in any story, between the rules and the world there are also *protagonists* and *antagonists*.

Thus, the supposed objectivity of the legislator narrator comes into play against the subjectivity of his surgeon character; one creates the norm, the other recreates it within the limits of his incomplete knowledge. The

legislator's reasoning is pitted against the physician's interpretation and arbitrariness, and against those of another character, the judge. The legislators and authors of the rules write a script for the protagonist surgeon of this imaginary story; however, the actors on the real stage of the world, with all the vicissitudes of the variable and random, will be his antagonists. Moreover, sometimes the surgeon in question will be antagonistic to himself. It happens in the best tragedies.

We are then faced with a tension between the *pretended order* of the rules, however ambiguous and vague they may be, and the *real disorder* of the world. But, in the end, and strange as it may seem, between *two different types of disorder*, that of the normative account, closed, incomplete and incoherent as a constructed system, but certain and indisputable for the legislator, and the disorder of the facts in the world, neither certain nor indisputable, but random and contingent. These are two types of disorder separated by a hiatus that the surgeon must resolve in each decision because, whether one wants it or not, that bottle of glass, badly blown by different normative artisans with unequal intellectual capacities, not at all crystalline, full of bubbles, nooks and crannies, and imperfections, constitute the reality of this country.

This involuntary normative fiction seemed at times to be an *cadavre exquis*, an exquisite corpse, the surrealist word game in which each participant contributed a fragment of a phrase, ignoring what the previous players had written, since the sheet of paper was folded at that point where one left the text suspended to the occurrence of the other. When the paper was unfolded, it emanated an infinity of poetic, intuitive, spontaneous, and unconscious images. Surrealism was a movement in the visual and literary arts at the beginning of the 20th century, whose creative and expressive procedures made use of all those varieties of psychic manifestation, automatism, dreams, and the unconscious, as "*real* functioning of thought"[11] (italics are mine) in the absence of any intellectual control, a response to the rationalism of that time, represented in large part by the Vienna Circle and the logical positivism.

Despite their formal structure, NOM, GPC, and regulations are policies to shape practices. They do not respond entirely to logical, bare, and impersonal evidence, but to the public interest, and involve discernments that may be erroneous, even if well intentioned, and to simplify decisions for the receiver of the message and are not always adequate to health care or teaching. Mexican laws and norms should not appear as an automatic, emotional, group, stream-of-consciousness writing; on the contrary, they are a very conscious attempt to articulate a coherent system that regulates medical practices. Thus, there is a dissonance between anonymous writers of rules, guidelines, regulations and laws, and medical actors in real scenarios. On the other hand, if someone does not know that the NOM exists, if they knowingly do not read it, and if they do read it but they do not understand it, then they are going off script. Although, in the words of a female surgeon colleague, it is worth more than nothing.

The surgeon, in addition to his clinical intuition, is bounded by legal criteria, and this is a good thing, since it limits the possibilities of those whose will, rather than free, is "free-wheeling". It is also evident that the more we have been doing something we do not understand, the more we will do it and the less we will understand why, and this is as true for the writers of the script as it is for its actors. But it cannot be concluded from this that a bad norm is *better* than no norm. A bad norm is, by its very defects, permissive, it is suturing half of the problem and letting the rest to close by second intention, without knowing from whom or when that intention will come. In the NOMs mentioned above, the second intention came years later.

When André Breton visited Mexico, he called it "the surrealist place par excellence", a captivating phrase that became an eponym that Mexicans liked, trite and *kitsch*. According to Humberto Schwarzbeck, the term 'surrealism' has become "a synonym for the picturesque form of the absurd, [and] Mexicans [...] call the stumbling blocks on their road to modernity surreal ...] [i]n the geography of the avant-garde, Mexico has thus occupied an emblematic place by virtue of *its backwardness*."[12] (Italics

are mine). That, the surreal, picturesque, and kitsch, is valid for some legal texts in Mexico, which are then *cadavres "non" exquises*, not exquisite, but in frank syntactic decomposition, from which it is difficult to extract any sense to practice medicine within the legal framework.

With respect to those forms of Mexicanity that Schwarzbeck calls picturesque, an effect called scenic distancing, the dramaturgical technique created by Bertolt Brecht, happens to me frequently - and it is largely for this reason that I am writing this essay. It is a phenomenon of estrangement in which the attention, when separated from the sympathy or antipathy for the characters and their actions, causes the spectator to open the frame to a general vision and contrast a concrete scenic situation with other similar situations in real life that are repeated and follow a pattern like the one described by the playwright. I will say, for example, that in Mexico another "Brecht effect" is presented to me every six years. The foreshadowing of the dilettante analysis of the "first one hundred days of government" - a political scientist's ritual (from the Latin *ritualis*, custom, habit, usage, observance)[13,14] - is followed by its invariable fulfillment. The gatopardo will be the same, no omen, a simple induction. On the other hand, the naïve will live the remaining 2,100 days as those first 100 days.

I return from the digression to give a concrete example of theatrical detachment in surgical practice, the performance of the *World Health Organization's (WHO) Surgical Safety Checklist*,[15] (hereafter *Checklist* or *The Checklist*) another mandatory regulation. When performed thoughtlessly it becomes meaningless. During the performance of *The Checklist* the actors on the surgical stage are not always cautious about what they are performing, they do it because it must be done; when it is, it becomes an empty ritual (from the Latin *ritualis*, ceremony, exercise, manner).[13] That sense of strangeness reminds me of iatrogenesis, an anamnesis in the medical sense of collected information. I see the praxis, what the hero does and the rest that happens on the proscenium, frame after frame, but without the purifying and therapeutic catharsis of an Aristotelian tragedy.[16] It gives me a frustrating awareness of the surgical anecdote that repeats itself as a stubborn routine.

Compliance with the *Checklist* is mandatory by decree,[17] the *Agreement declaring the mandatory implementation of the Essential Actions for Patient Safety* [Agreement CSG 60/06.03.17]. However, executed as a chant with the filling in of boxes, it resembles the ritual of the screaming children of the Lottery, it is nothing more than a hurried procedure before starting the surgical act, which is still misunderstood by some, starting with the scalpel, and culminating with the last stitch or the last staple. A decree, in a failed health system (or in a State) and, above all, without compliance controls, admits one intention and its opposite and produces, as I said before, anomalous adaptive behaviors.

An unreflective act "attached to rules", whether coherent or not, distances us from a fundamental tradition in medicine, the *hidden curriculum*, that knowledge, attitudes, and values that are not made explicit in a *syllabus* that teaching hospitals often lack but that are transmitted by word of mouth and, returning to Aristotle's *Poetics*, by mimesis.[16] Conducts, but not theories, are behaviors; they are taught from the trained surgeon to the forming surgeon. Thus, the *Checklist*, despite the decree, can become just another act in the theater of the absurd, performed but meaningless, unless through that scenic distancing we see it on a second, critical level. Residents, students, and assistants learn, through the hidden curriculum, good and bad practices as an ideology of life. The opposite side of the coin is that well-trained surgeon, cautious and scarce, aware that his will, better than the one of the norm writer, is subject to the legal environment of that inescapable bottle for flies.

PSYCHOLOGICAL ISSUES

Although the term 'arbitrariness' has a pejorative connotation, and although law and law enforcement aim at an effective defense against arbitrariness, understood in the authoritarian sense, it is also true that systems of rules can be so rigid or so incomprehensible that they paralyze the surgeon's good judgment, understood in its best sense as the capacity to

make decisions in the face of specific problems. On the other hand, it is impossible for a body of rules to have the scope, completeness and specificity required to regulate all professional conduct in all possible cases.

If to this the ambiguity of the terms used is added, a formalistic rhetoric of the 19th century, the fact that different articles of a norm refer to three or four others within the same norm, or of another norm, or to article X, section Y bis of General Law Z, and back to the norm, this discontinuous and complicated reading, which forces to jump from one side to the other of different texts, produces confusion. The normative immensity and confusion can produce in the surgeon a cognitive phenomenon called semantic satiety, due to excessive stimulation between the normative style, quite different from the style of literature to which he is accustomed, and what he perceives in the real world, which requires his attention and action. If, in addition, the knowledge of the language itself is insufficient, then he/she compensates for the saturation and lack of understanding by generalizing the norms into a crude synthesis that makes it easier for him/her to function. For this surgeon, not reading the norm and improvising outside the script is an adaptive mechanism; it becomes habitual to work outside the norm.

This shows a tension between the ideal and the real, the lack of intersubjectivity and communication between those who made the laws and handed them over as finished instruments, and those who must use them as tools for their work, the surgeons.

The contemporary reality is not like in the past when the practice of the profession was much freer. To state the obvious, nothing is like it used to be, not one second is like another, everything is a constant Heraclitan becoming. The judicialization of medical practice, a consequence of complex interactions between physicians, service providers, public and private institutions, third payers, and patients, makes free, old-fashioned professional practice impossible. It is necessary to learn to work in the environment of a previously non-existent normativity.

Now an anecdote it is common in discussions of this type. At the symposium from which this essay arises,[18] someone asked whether the surgeon "is obliged to know all the rules" [sic]. Such a question, whether naive or cunning, reminds me of another who claimed to have read the Bible, but not all of it. Although Diego Valadés recommends reading the Constitution, he also recognizes that "*it changes too often*, [and that] it is not easy to read many laws and technical codes and norms intended to be handled by experts".[1] (Italics are mine). To the Constitution and the Bible let us add the immensity of medical literature. In order not to get lost in such a vast literary world, the surgeon must investigate what rules and guidelines govern his activity. It will do him no good to read the Constitution and the Song of Songs if he does not know how often he should order mammograms, an ignorance that can be apocalyptic for a patient.

I cite yet another regulation, by way of response to the bibliophobe, the *Mexican Official Norm NOM-006-SSA3-2011*, for the practice of anesthesiology, which every surgeon should be familiar with.[19,20] In a thorough analysis of this NOM, anesthesiologist Luis Héctor Soto-Toussaint concludes that this standard is not current, that its obsolescence is known, that it is relevant even though it has not been updated but, above all, that "there is a high risk in using this current standard", also full of ambiguities, incomplete definitions, omitting the capabilities and obligations of anesthesiologists and, coinciding with the NOMs cited above, "that they are not entirely clear and detailed, *leaving the correct interpretation to the discretion of each reader*".[21] (Italics are mine). Worse still, "in the event that in practice an adverse event occurs, the judge in a litigious case will not have the elements of judgment beyond what is presented to him and there is a serious and total contradiction of the norms, [therefore] the Mexican state is left with the duty [sic] of care imposed by the laws of the matter".[21] Regarding Soto-Toussaint's criticism, two things must be specified: first, that there is a new standard, *NOM-006-SSA3-2017, For the practice of anesthesiology* published in the DOF on January 31, 2018, which leaves NOM-006-SSA3-2011 without effect; second, that in this new NOM, many of the problems and shortcomings criticized in the 2011 NOM

remain unchanged. The new NOM speaks for itself.[22]

Despite everything, the surgeon cannot, in order to lessen the burden of his profession, delegate the NOM, nor its abstruse nature, nor its comprehension, to the anesthesiologist, under the pretext of "putting one's own shoes on", "respecting the functions", "not stepping on the corns" and some other expression of the kind that typifies us, following Schwarzbeck's quote, as picturesque of the absurd. Bibliophobia is a character trait; knowing the rules is a professional duty. Such shortcomings must then be alleviated, without expecting NOM to ever have the coherence of a theorem, without expecting some utopian and future government to update it. Several years may pass before it is attempted - in the three mentioned above, six, nine and six years passed - and the NOM has not been perfected.

OPERATIONAL ASPECTS, TRUST AND CONTROLS

The psychological aspects have a lot to do with the operational aspects, how the systems would work and, of course, with the factual aspects, how they will work in real situations. Many institutional systems built to facilitate accountability have the opposite effect, they do not work as they should. Instead of standardizing practices to make them more reliable and decrease failures, ensure trustworthiness and evidence to support that trustworthiness of people and institutions, they make the job more difficult. For example, physicians often spend as much or more time filling out regulatory paperwork than they do on procedures.[23] By way of adaptive behavior, the *Checklist* can be executed with undue haste to get into the actual procedure, especially when time is at a premium.

Controls have their flats; some measures taken to increase the honesty and trustworthiness of professionals, such as audits, may not increase trust but distrust. Trust implies economy in monitoring and audits, allowing those who are worthy of it to work with minimal oversight. Conversely, decreased trust results in increased monitoring, audits, coercion, and sanctions. Those who are not trustworthy make all these measures necessary. Good performance during audits does not mean trust, it means that the individual is aware of being observed, and probable submitted to coercion and sanctions. On the other hand, accountability takes a different form when it is collective, as in a corporation, and when it is individual, as in the case of a particular surgeon; however, in the case of an organization, such as a hospital, both procedures and individuals may be at fault.[23]

Regarding controls, analogies are made between the WHO *Checklist* and the flight crew *checklist,* "an assistive tool [...] designed *to reduce errors caused by potential limits of memory and attention in humans* [that] assists in ensuring consistency and completeness in the performance of a task [...] by *allowing mutual monitoring among flight crew members*, thus keeping all of them informed".[24] (Italics are mine). Despite the goal of enabling mutual monitoring to reduce errors, *checklists* are not a panacea either. In this entry, Carlos Delgado also points out problems of ambiguity, as "[t]he responses to the checklist should reflect the actual situation or value of the item (switches, levers, lights, quantities, etc.). For checklists, vague responses, such as 'established,' 'verified', or 'completed' should be avoided.[24] (Italics are mine). In that, checklists resemble NOMs.

Continuing with the controls, let us imagine now that we film every surgical act, including the involved staff. Would systems such as the *Fly cam* or a *Pilot's eye* be of any use? In these, a variable number of cameras film, in real time, from various angles, the commander and the first officer, including the face. In operating rooms, would it be cost-effective to film the behaviors of team members? In the case of a non-endoscopic procedure, or one that requires conversion to open surgery, would it also be feasible to film the operative field? Given the technical difficulties - and anyone who has done surgical photography or cinematography knows this well - could operators be available to film the procedures, instead of fixed *Fly cams*? Who would pay for all this in private hospitals? The patient (or his insurance, perhaps...) And, in a bankrupt national health care system, would it be worthwhile, then, to raise the level of control? And who would supervise the videos? Each hospital, or another regulatory body

at the national level? Increasing the level of controls does not guarantee confidence in the instruments, nor in those who implement them.

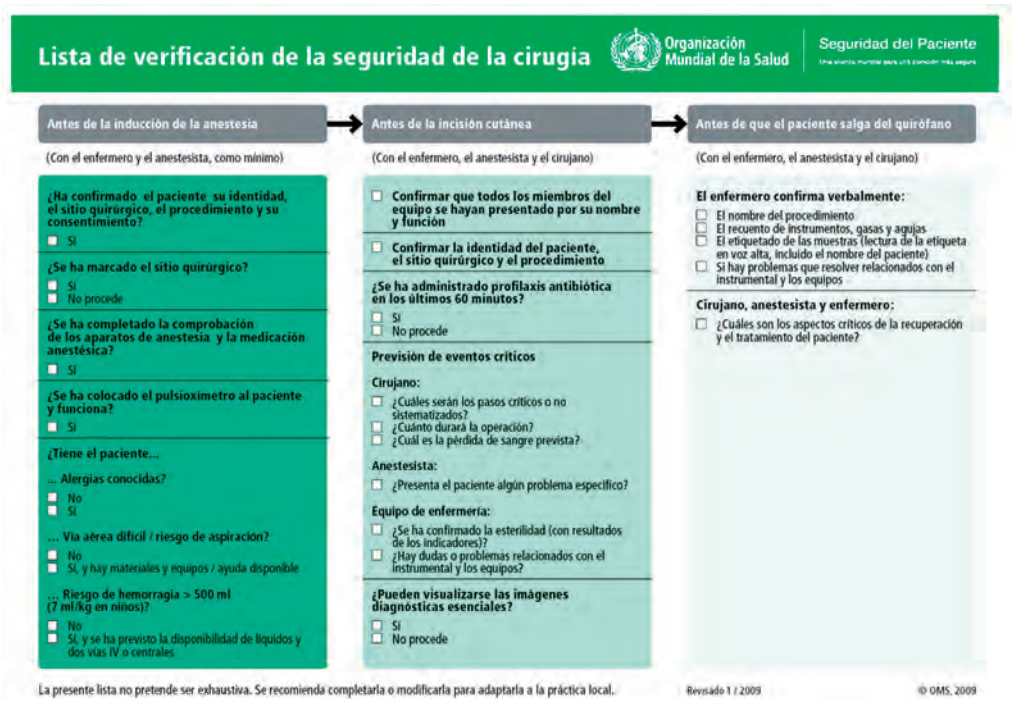
FACTUAL ISSUES

Let us now look at matters of fact, based on real and contingent experiences in the world. First, why do all these efforts make little difference to the situation? Why are prevention instruments ineffective?

For example, because, according to WHO, the Checklist "does not claim to be exhaustive. It is recommended that it be completed or modified to suit local practice", according to an implementation manual in support of The Checklist, which details how each step should be performed and specifies that a given department should modify it by adding details, "so that it can be established within its regular operational workflow".[14] Yet, despite WHO's recommendations, reality is not changed by decree. For example, the *Agreement declaring mandatory [...] the document entitled Essential Actions for Patient Safety*[17] states directives that are de facto not complied with. An exhaustive comparison of these documents is beyond the scope of this essay. I leave as examples the WHO Checklist and the Modified List of the Ministry of Health.

Decrees are not self-executing. Already in the previous section I have proposed, based on questions, hypothetical problems that would increase control levels. But it is also possible that, despite the best control instrument, the attention of the participants may be elsewhere, that during the Checklist some team member may be checking "urgent" messages on his or her phone, or choosing the music to tune in during the intervention. These are not problems of rules, they are problems of attitude. At that point there should be nothing overriding The Checklist, other than a change in the patient's vital signs or a monitor alarm.

Second matter of fact. The checklist works because every crew member, including the ground crew, has done a pre-job, which the commander and flight officer collate together. Moreover, an aircraft will not take off unless it has been fueled for a given distance and a given load, not enough but to spare, in case of an incident. The WHO recommendation assumes that every hospital will have enough supplies for an ideal operating room, as if it were an


Lista de verificación de la seguridad de la cirugia

Organización Mundial de la Salud | Seguridad del Paciente

Antes de la inducción de la anestesia
(Con el enfermero y el anestesista, como mínimo)

¿Ha confirmado el paciente su identidad, el sitio quirúrgico, el procedimiento y su consentimiento?
- Sí

¿Se ha marcado el sitio quirúrgico?
- Sí
- No procede

¿Se ha completado la comprobación de los aparatos de anestesia y la medicación anestésica?
- Sí

¿Se ha colocado el pulsioxímetro al paciente y funciona?
- Sí

¿Tiene el paciente...

... Alergias conocidas?
- No
- Sí

... Vía aérea difícil / riesgo de aspiración?
- No
- Sí, y hay materiales y equipos / ayuda disponible

... Riesgo de hemorragia > 500 ml (7 ml/kg en niños)?
- No
- Sí, y se ha previsto la disponibilidad de líquidos y dos vías IV o centrales

Antes de la incisión cutánea
(Con el enfermero, el anestesista y el cirujano)

- Confirmar que todos los miembros del equipo se hayan presentado por su nombre y función
- Confirmar la identidad del paciente, el sitio quirúrgico y el procedimiento

¿Se ha administrado profilaxis antibiótica en los últimos 60 minutos?
- Sí
- No procede

Previsión de eventos críticos

Cirujano:
- ¿Cuáles serán los pasos críticos o no sistematizados?
- ¿Cuánto durará la operación?
- ¿Cuál es la pérdida de sangre prevista?

Anestesista:
- ¿Presenta el paciente algún problema específico?

Equipo de enfermería:
- ¿Se ha confirmado la esterilidad (con resultados de los indicadores)?
- ¿Hay dudas o problemas relacionados con el instrumental y los equipos?

¿Pueden visualizarse las imágenes diagnósticas esenciales?
- Sí
- No procede

Antes de que el paciente salga del quirófano
(Con el enfermero, el anestesista y el cirujano)

El enfermero confirma verbalmente:
- El nombre del procedimiento
- El recuento de instrumentos, gasas y agujas
- El etiquetado de las muestras (lectura de la etiqueta en voz alta, incluido el nombre del paciente)
- Si hay problemas que resolver relacionados con el instrumental y los equipos

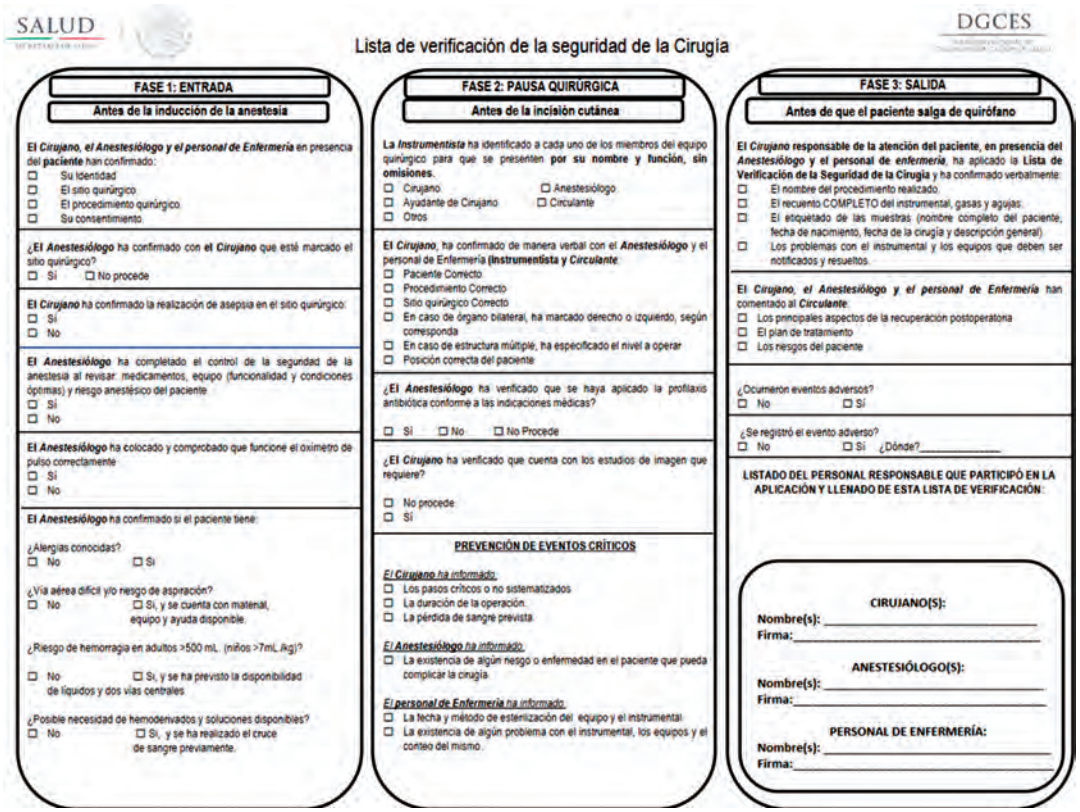
Cirujano, anestesista y enfermero:
- ¿Cuáles son los aspectos críticos de la recuperación y el tratamiento del paciente?

La presente lista no pretende ser exhaustiva. Se recomienda completarla o modificarla para adaptarla a la práctica local.

Revisado 1 / 2009 © OMS, 2009

Figure 1:

WHO surgery safety checklist. Available at https://www.who.int/patientsafety/safesurgery/es/


SALUD

DGCES

Lista de verificación de la seguridad de la Cirugía

FASE 1: ENTRADA

Antes de la inducción de la anestesia

El ***Cirujano, el Anestesiólogo y el personal de Enfermería*** en presencia del **paciente** han confirmado:
- ☐ Su identidad
- ☐ El sitio quirúrgico
- ☐ El procedimiento quirúrgico
- ☐ Su consentimiento

¿El ***Anestesiólogo*** ha confirmado con el ***Cirujano*** que esté marcado el sitio quirúrgico?
☐ Sí ☐ No procede

El ***Cirujano*** ha confirmado la realización de asepsia en el sitio quirúrgico:
☐ Sí
☐ No

El ***Anestesiólogo*** ha completado el control de la seguridad de la anestesia al revisar: medicamentos, equipo (funcionalidad y condiciones óptimas) y riesgo anestésico del paciente
☐ Sí
☐ No

El ***Anestesiólogo*** ha colocado y comprobado que funcione el oxímetro de pulso correctamente
☐ Sí
☐ No

El ***Anestesiólogo*** ha confirmado si el paciente tiene:

¿Alergias conocidas?
☐ No ☐ Sí

¿Vía aérea difícil y/o riesgo de aspiración?
☐ No ☐ Sí, y se cuenta con material, equipo y ayuda disponible.

¿Riesgo de hemorragia en adultos >500 mL (niños >7mL /kg)?
☐ No ☐ Sí, y se ha previsto la disponibilidad de líquidos y dos vías centrales

¿Posible necesidad de hemoderivados y soluciones disponibles?
☐ No ☐ Sí, y se ha realizado el cruce de sangre previamente.

FASE 2: PAUSA QUIRÚRGICA

Antes de la incisión cutánea

La ***Instrumentista*** ha identificado a cada uno de los miembros del equipo quirúrgico para que se presenten **por su nombre y función, sin omisiones**.
- ☐ Cirujano ☐ Anestesiólogo
- ☐ Ayudante de Cirujano ☐ Circulante
- ☐ Otros

El ***Cirujano***, ha confirmado de manera verbal con el ***Anestesiólogo*** y el personal de Enfermería (**Instrumentista y *Circulante***:
- ☐ Paciente Correcto
- ☐ Procedimiento Correcto
- ☐ Sitio quirúrgico Correcto
- ☐ En caso de órgano bilateral, ha marcado derecho o izquierdo, según corresponda
- ☐ En caso de estructura múltiple, ha especificado el nivel a operar
- ☐ Posición correcta del paciente

¿El ***Anestesiólogo*** ha verificado que se haya aplicado la profilaxis antibiótica conforme a las indicaciones médicas?
☐ Sí ☐ No ☐ No Procede

¿El ***Cirujano*** ha verificado que cuenta con los estudios de imagen que requiere?
☐ No procede
☐ Sí

PREVENCIÓN DE EVENTOS CRÍTICOS

El Cirujano ha informado:
- ☐ Los pasos críticos o no sistematizados
- ☐ La duración de la operación
- ☐ La pérdida de sangre prevista

El Anestesiólogo ha informado:
- ☐ La existencia de algún riesgo o enfermedad en el paciente que pueda complicar la cirugía

El personal de Enfermería ha informado:
- ☐ La fecha y método de esterilización del equipo y el instrumental
- ☐ La existencia de algún problema con el instrumental, los equipos y el conteo del mismo.

FASE 3: SALIDA

Antes de que el paciente salga de quirófano

El ***Cirujano*** **responsable de la atención del paciente, en presencia del *Anestesiólogo* y el personal de *enfermería***, ha aplicado la **Lista de Verificación de la Seguridad de la Cirugía** y ha confirmado verbalmente:
- ☐ El nombre del procedimiento realizado
- ☐ El recuento COMPLETO del instrumental, gasas y agujas.
- ☐ El etiquetado de las muestras (nombre completo del paciente, fecha de nacimiento, fecha de la cirugía y descripción general)
- ☐ Los problemas con el instrumental y los equipos que deben ser notificados y resueltos.

El ***Cirujano, el Anestesiólogo y el personal de Enfermería*** han comentado al ***Circulante***:
- ☐ Los principales aspectos de la recuperación postoperatoria
- ☐ El plan de tratamiento
- ☐ Los riesgos del paciente

¿Ocurrieron eventos adversos?
☐ No ☐ Sí

¿Se registró el evento adverso?
☐ No ☐ Sí ¿Dónde?_____

LISTADO DEL PERSONAL RESPONSABLE QUE PARTICIPÓ EN LA APLICACIÓN Y LLENADO DE ESTA LISTA DE VERIFICACIÓN:

CIRUJANO(S):
Nombre(s): _____
Firma: _____

ANESTESIÓLOGO(S):
Nombre(s): _____
Firma: _____

PERSONAL DE ENFERMERÍA:
Nombre(s): _____
Firma: _____

Figure 2: *Surgery safety checklist of the General Directorate of Quality and Education in Health of the Ministry of Health. Available at: https://www.gob.mx/cms/uploads/attachment/file/29526/seguridadPaciente_02.pdf*
For reference, there is another modification of The Checklist in the document Preventive Interventions for Surgical Patient Safety, of the Mexican Institute of Social Security, which I do not include for reasons of space. Available at: http://www.imss.gob.mx/sites/all/statics/guiasclinicas/676GER.pdf

airplane. Where does that leave us? Can the instrument be blamed? Not so much. We have seen that an instrument is a useful object depending on the quality of those who make it, the reasoning of those who use it, and the specific circumstances of its use. Procedures are designed and controlled by humans, therefore fallible; when they fail, they must be revised.

But another no less important fact is the sufficient supply of the necessary supplies for each event, which in public hospitals may not be the case. The job of adaptation, according to the WHO, falls to each hospital in each health system of each country. Although WHO recommendations assume that all hospitals will have sufficient supplies, the reality is different. The shortage of supplies is "the normal", not "the pathological" -to paraphrase backwards the title of Georges Canguilhem's book *Le normal et le pathologique*, The normal and the pathological. In other words, in Mexico the pathological has become normal.

THE SCREAMING LOTTERY CHILDREN

The template, the cyanotype of the Checklist, has no modifications for cases of shortages or shortages so that, to quote J. Choy again, the boxes are filled in with false data.[10] The ritual of The Checklist then resembles what the screaming children of the National Lottery do, spokespersons of fortune, image of legality. Only that in the operating room the ritual of shouting adapts the factual reality to the legal reality, the reality of the facts to a paper reality, and not the other way around, the paper does

not reflect the facts. Even if The List has the imperfections shown in the *figures*, checking boxes to the exclamatory rhythm does follow the script; the team "sticks to the rules", as crude as The List may be. Anything else that happens can be assumed to be incidental. If by chance an iatrogenic event does not occur, in the Mexican style, "we've already done it".

THE NEVER-ENDING STORY: WHY DO I SEE THE SAME MOVIE AND OTHERS DON'T?

Another factual aspect is that the Checklist is mandatory but not coercive, unless non-compliance results in a (multifactorial) iatrogenic event, which can be demonstrated, and which leads to a lawsuit. And even then, there are, in addition to the infinite possibilities of interpretation, speech and eloquence as evidence-based justice, so that reaching a sanction may not happen. What seem to be "hidden" aspects of medical malpractice and lack of effectiveness of preventive measures, are quite evident; the institutional physician cares little about complying with requirements that he/she labels as mere bureaucracy because, de facto, little criminal sanctions are applied and even less the reparation of damages, because when the sanction is unavoidable, it is often administrative, perhaps a disqualification, which the typical public official fears little. That is why, due to the lack of adequate controls, some complicities, and taking for granted that reality is like that, history repeats itself endlessly.

It is another matter of fact that the patient in a public institution has neither the economic resources nor the knowledge to raise his complaint to the competent authorities, even less to take a judicial process that, even if it is "free" may assign such complaint to a public defender with little expertise in iatrogenic issues, whose formalistic and archaic speech the patient will not understand, a process of attrition that may last for years to recover something that the State itself does not provide, a quality medical care. A quite different scenario is that of the same surgeon in his private practice; there his pocket will be affected, in legal costs, deductibles and insurance premiums against damages. In that scenario the attrition will be for him, and the bad reputation as well. The schizophrenia manifested between public and private medicine.

ANOMALOUS ADAPTIVE BEHAVIORS

Abstruse and difficult to understand norms produce anomalous adaptive behaviors that can occur for different reasons. In the first case, the surgeon avoids the tedious analysis of these rules, loses the panoramic view, and adopts a tunnel vision. He can focus on the surgical field, leaving the rest to the anesthesiologist and the monitors "respecting the functions", and the filling of The List to the one who filled it. He trusts his experience, which he considers infallible because he has always done so, because he understands little of the norm. Routine (and indolence is one kind) allows him to stay in his comfort zone. Only static reasoning, like stagnant water, rots. To this surgeon, the constant Heraclitan becoming is unknown, as is the decline of his skills, which he trusts to be immovable, that yield their ground to the usury of time, when he is only capable of understanding routine, what he has always done, with or without rules. Then he is more prone to produce iatrogenic outcomes, and before a process he will argue, as a defense mechanism, that he has always done it this way, that (on paper) he "stuck to the rules". He will produce justifications and excuses, different stories, and other narratives.

The second case of anomalous adaptive behaviors is for the opposite reason, but also with side effects. It is that of the committed surgeon who, to avoid administrative sanctions for acting ethically, although outside an aberrant normativity, prefers to adhere to it, but for different reasons. Two surgeons attending the symposium provided interesting anecdotes. One, that it is easier for a surgeon to ask for an exit pass to go to a private surgery than to leave his private practice to return to the public hospital to check a seriously ill patient; another was, who once, for concluding an operation that started after the end of his shift, he received an administrative sanction for non-compliance with the human resources regulation of "checking his card" in due time. And another one, finally, argued that it is not allowed to enter

the hospital outside the assigned hours, because it is a violation of the hospital regulations.[25]

Adaptive behavior consists of acting in strict adherence to hospital regulations. There, the environment is also prone to iatrogenic outcomes if there is not adequate communication and relief or, if despite informing, the surgeon on the next shift decides, of his own accord, to take a different course of action. Each hospital shift leaves the plane in strict accordance with the clock because it is bound by the rule and to avoid sanctions used by administrative staff, who prefer to see rules rather than facts. In the end, "sticking to the rules" results in the empowerment of public employees who care less about the patient and more about the labor union.

EPILOGUE: FACT OR FICTION

In the proposed thought experiment, as in every story, there is a conflict. The fiction of the story imposes itself on reality like a straitjacket. The conflict is expressed in the Latin maxim *"a verbis legis non est recedendum"* meaning that from the word of the law there is no deviation; a court does not have the power to ignore the express letter of a statute in favor of a supposed intention.[26] In Mexico we use the euphemism "with strict adherence to the law", in accordance with the Napoleonic criterion adopted in Mexico in the process of codification of law, and now widely used as a broad-spectrum prophylactic.

The narrative scenario is then the following: if ideal norms intend to regulate practices in the real world, and practices require human interactions, then interpretation vis-à-vis the facts is an inevitable part of compliance with the norms; that interpretation implies the *recessus*, the deviation that the law does not allow. Therein lies the question and the contradiction as to whether the narratives of normativity are fact or fiction. Without denying that there are well-written and coherent laws and norms that are easily and successfully applicable to real situations, it must be accepted that other norms - drafted by different agents with different professional backgrounds and heterogeneous knowledge of what they intend to legislate, with a deficient knowledge of their own language and an incorrect and bombastic syntax - constitute fictitious narratives that seek to regulate real problems.

Having analyzed the linguistic, technical, psychological, operational, and factual aspects, let us now consider the ethical aspects: to stick rigidly to the rules or to deviate from them? Is unrestricted adherence to the rules a legal or a moral dilemma? According to the law there is no dilemma; the written law is complied with. From the moral point of view, the perspective is different.

In the presence of iatrogenesis, some will argue that they adhered "strictly to the regulations". This is a convenient argument to avoid hospital, morbimortality or ethics committees questioning. It is easier for someone to say, "in strict accordance with the law" without giving any other justification for the procedure, than to say, "in strict accordance with my surgical criteria", having to reconstruct the paths and options that led him/her to the chain of decisions for which he/she is responsible. That surgeon fixed on "the written word", with more authors than there are in the Genesis book, will sooner or later end up committing an immoral act.

For example, what happens if a surgeon does not go in to operate on an emergency because his/her shift is about to end and he/she must "check his card", and if the person who should arrive on the next shift does not do so. The regulations do not cover the moral aspects of the surgeon's responsibility; it is not their function. The written word demands to act verbatim, word for word; it does not ask to think but to comply. In that sense, the arguments given by that surgeon may be legally correct, but morally questionable. They will be a defense mechanism. A justification? Legally yes, morally no. Strict adherence may be the result of experience, as he/she may have experienced in the flesh the administrative sanctions for working out of shift, or for performing procedures without the proper material, due to the shortage itself, although with the best will. The surgeon may then find himself/herself faced with a conflict, which he/she must resolve with his/her best judgment, which the law is intended to avoid.

One last journey before concluding. As an analogy to the terms 'iatrogen' and 'iatrogenic', the terms 'paracleptogenic' and 'paracletogenic' (from the Greek parákletos, he who is called, he who intercedes) could be coined to refer to the quality of harm and the harm produced by a lawyer. We could also coin the term 'paracletophobia' to refer to the traditional horror of the lawyer and his interpretation of what others (the anonymous writers of the rules) meant, and which applies to decisions made by the physician in circumstances that may or may not adhere to the rule, well or poorly written. Outside of what in a trial is evidence of iatrogenic on any of the traditional and well-known grounds, paracletophobia is not gratuitous.

I may conclude, although a jurist may debate it, that norms are useful fictions. In Mexico, their usefulness is limited, as they are often poorly structured, ambiguous, and abstruse stories with which reality is tried to be ordered. Only when the surgeon's judgment, derived from a tiresome and meticulous reading, makes him/her intuit the imprecision of his legal environment and forces him to ask himself critical questions about those statements, in order to put them to him in a convenient way, will he/she be able to fill in the gaps of those fictions, comply with the regulations and with his/her surgical will, which is not entirely free, but limited between what the regulations say and what the patient requires.

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