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Sustainable operating room

Quirófano sustentable

Abilene Cirenia Escamilla-Ortiz*

Climate change will define the health crisis of the 21st century and represent a global health challenge. The scope of problems resulting from climate change is immense, including sea level rise, extreme weather, and increased carbon dioxide in the atmosphere.[1]

Anesthetic gases have been compared to other greenhouse gases; for example, desflurane emissions in a 2-hour surgery are equivalent to driving a car 608 km, compared to sevoflurane, which is equivalent to driving 26 km, which translates to more carbon footprint than neuroaxial or intravenous anesthesia.[1] Some alternative strategies include low-flow anesthesia of blue zone technologies that capture, recover, and purify halogenated agents.[2]

Some hospitals have systems for capturing these gases to destroy, deposit, or purify them before they reach the environment.[1]

There is a significant waste of medicines because the ampoules are opened, and only some of the contents are used; it needs to be indicated that they should be reused. Therefore, this content ends up polluting the environment. Each hospital has its policies for the disposal of these drugs by the regulations; for example, the regulation on hazardous waste published in 2020.[1]

Therefore, it is crucial to ensure that the medicines are delivered with the dosage required by the patient; the sterile mixture standard in our country must do this. Unfortunately, not all institutions have these spaces and trained personnel.[1]

In the UK, it is estimated that the healthcare system is responsible for 4 to 5% of the country's carbon footprint, producing more carbon emissions than all the planes taking off from Heathrow Airport simultaneously.[2]

According to the Global Report on Surgery 2030, 143 million additional surgical interventions are needed yearly to save lives and prevent disabilities, so we must consider making surgical practice more sustainable.[2]

The COVID-19 pandemic has taught us to adapt in surgical practice in response to a global crisis. The operating room of the past needs to change, bed turnover in hospitals is inefficient, measures must be taken to have fewer days of stay, outpatient management, and others.[2]

Recent evidence suggests that traditional scrubbing is not necessary, and there is no significant difference in the rate of surgical site infection when using antiseptics such as chlorhexidine and iodopovidone.[2,3]

The surgeon will have to assess whether the surgical procedure is appropriate for all, such as salvage surgery or palliative procedures in advanced malignancies.[2]

The surgical team should reduce waste in the operating room by recycling, reducing, reusing, and reprocessing. Some materials used in the operating room can be recycled, such as dialysis solution bags, intravenous solutions, oxygen masks, ventilation circuits, all medication vials (glass), and cardboard packaging of medications, to name a few.[3]

Therefore, containers must be available to separate these wastes so that they can be put to other uses.[3]

Change the lights to LEDs; if any area of the operating room is not being used, turn off

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the lights, and change the air recycling times per hour.[3]

We will encounter barriers to instituting a sustainable operating room, including lack of leadership, lack of education, negative team attitudes, seeing it as a workload, misconceptions regarding infection risk, and resistance to change. It is possible to mitigate the negative impacts in the OR by educating the entire multidisciplinary team.[3]

Obesity contributes to the risk of cholecystitis and osteoarthritis. Therefore, health programs should focus on healthy eating and exercise, reducing 250,000 emergency room admissions and 700,000 cholecystectomies annually in the United States, 1 in 5,000 patients requiring hip replacements, and many bariatric surgery procedures.[4]

It would help if health personnel considered returning to reusable equipment or instruments, some of which do not require sterilization but only washing with soap and water.[4]

There is much work to be done. Carbon emissions are each surgeon's responsibility. We must work together with surgeons from other countries to exchange solutions.

In this sense, the Mexican Association of General Surgery, with Dr. Eduardo Moreno Paquentín, has begun some actions in this regard since 2018, and the associates are invited to join us.

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Incidence and risk factors of post-incisional abdominal eventration in postoperative exploratory laparotomy patients

Incidencia y factores de riesgo de eventración abdominal postincisional en postoperados de laparotomía exploradora

César Luis González-Palacio,[*] Marco Javier Carrillo-Gorena,[*] Manuel David Pérez-Ruiz,[*] César Eduardo Venegas-Yáñez,[*] Gaspar Iglesias-Palacios,[*] Sofía Carolina González-Cristóbal,[*] Víctor Hugo Hernández-Estrada,[‡] Ana Irene Pérez-Echavarría,[‡] Arely Estefanía Contreras-Pacheco,[‡] Luis Bernardo Enríquez-Sánchez[*]

Keywords: post-incisional ventral hernias, ventral hernias, laparotomy, incidence, eventration, abdominal.

Palabras clave: *hernias ventrales postincisionales, hernias ventrales, laparotomía, incidencia, eventración, abdominal.*

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ABSTRACT

Introduction: post-incisional ventral hernias are one of the most frequent postoperative complications. There are different repair techniques for post-incisional ventral hernias; in most cases, synthetic meshes are used, obtaining better results in terms of recurrence. **Objective:** to report the number and incidence of post-incisional ventral hernias in postoperative exploratory laparotomy patients at the Central State Hospital. **Material and methods:** a retrospective cross-sectional observational study in which operating room databases were analyzed to find postoperative patients with post-incisional ventral hernias at the Central Hospital from 2017 to 2018. Selected patients were contacted one year later to corroborate whether they developed post-incisional ventral hernias. **Results:** 74 patients who met the inclusion criteria were analyzed. We found a prevalence of 17.1% of patients who developed post-incisional ventral hernia in 2019 at the Central Hospital of the State of Chihuahua. The average age was 42 years. **Conclusions:** we found no relationship between the factors studied and the development of post-incisional hernias.

RESUMEN

Introducción: *las hernias ventrales postincisionales son una de las complicaciones postoperatorias más frecuentes. Existen diferentes técnicas de reparación para las hernias ventrales postincisionales; en la mayoría de los casos se utilizan mallas sintéticas, obteniendo mejores resultados en cuanto a recidiva.* ***Objetivo:*** *reportar el número e incidencia de hernias ventrales postincisionales en pacientes postoperados de laparotomía exploradora en el Hospital Central del Estado.* ***Material y métodos:*** *estudio observacional retrospectivo de corte transversal, en el cual se analizaron bases de datos de quirófano para encontrar pacientes postoperados de hernia ventral postincisional en el Hospital Central de 2017 a 2018 y se contactó a los pacientes seleccionados un año después para corroborar si éstos desarrollaron o no hernias ventrales postincisionales.* ***Resultados:*** *se analizaron 74 pacientes que cumplieron con los criterios de inclusión. Se encontró una prevalencia de 17.1% de pacientes que desarrollaron hernia ventral postincisional durante el año 2019 en el Hospital Central del Estado de Chihuahua. La edad promedio fue 42 años.* ***Conclusiones:*** *no encontramos relación entre los factores estudiados y el desarrollo de las hernias postincisionales.*

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INTRODUCTION

Total post-incisional ventral hernias are one of the most frequent postoperative complications; the risk of developing a hernia after elective surgery is between 5 and 20%.[1,2] A post-incisional ventral hernia is defined as a palpable and visible mass no more than 3 cm from the surgical scar.[3,4] The increasing incidence of post-incisional ventral hernias is due to a growing, aging population with obesity, among several other risk factors, undergoing abdominal surgeries.[5-7] Some risk factors mainly associated with the appearance of hernias are infection, obesity, tobacco use, malnutrition, immunosuppressive therapy, chronic pulmonary disease, ascites, emergency surgeries, age over 70 years, hypertension, malignancy, and connective tissue defects; they produce failure in the repair of the injured tissue at the time of the surgical procedure so that its anatomical structure is compromised and is reflected as a defect of the abdominal wall.[5] Obesity is one of the most frequent risk factors in the development of post-incisional ventral hernias;[8] about 2/3 of patients with ventral hernias suffer from obesity, having a body mass index greater than 30, in addition to reporting a recurrence of between 30 and 40%.[2,9] The increasing incidence of post-incisional ventral hernias is due to a growing population, aging with both obesity and major abdominal surgeries, which predisposes to a lower quality of repair and collagen created.

Wall closure could also be considered a predisposing factor for the appearance of ventral hernias; the type of suture material used to perform it has been questioned. Histologically, two subtypes of macrophages are known: subtype 1 has proinflammatory properties, and subtype 2 contains regulators of extracellular matrix remodeling. An increased expression of type 2 macrophages was found with polydioxanone (PDS) in the early days. Type 2 macrophages favor fibroblast activity, which is why they are considered a good prognostic factor and could positively affect abdominal wall repair. This activity provides arguments for closing the abdominal wall with polydioxanone sutures compared to vicryl or prolene.[10]

Using meshes for repair is a common practice, either open or laparoscopic, and their use produces a lower percentage of recurrence. However, they have an essential disadvantage since they increase the risk of infection, erosion, and fistula formation, and even mesh migration can occur.[11] The causes of this migration can be classified into two: those produced mechanically due to the patient's movement and those that occur secondary to erosion of the surrounding tissues.[12,13]

For hernia repair, mesh placement can be performed laparoscopically.[14,15] It is a procedure that consists of patching the abdominal wall defect with a non-absorbable mesh attached to the wall.[16-19] Post-incisional hernias recur up to 44% after the first repair. Recurrence with the laparoscopic technique is comparable to that of the open technique.[20,21] The laparoscopic technique is only sometimes possible due to the hernia size (greater than 7 cm).[22-25]

This study aims to define the incidence of post-incisional ventral hernias in postoperative exploratory laparotomy patients at the Central State Hospital and find a relationship between risk factors and suture material used for closure.

MATERIAL AND METHODS

This report refers to an observational, retrospective, cross-sectional, retrospective study developed at the Hospital Central del Estado, Chihuahua, Mexico. Operating room and records databases were analyzed to find cases that underwent emergency exploratory laparotomy surgery at the hospital from 2017 to 2018.

In the clinical records, the suture material used for abdominal wall closure was investigated. The selected patients were contacted one year later to corroborate whether or not they developed post-incisional ventral hernias. In addition, post-surgical notes from the clinical records were analyzed to define the type of closure and suture used in the exploratory laparotomy. The data obtained were analyzed with IBM SPSS Statistics 22 software.

Inclusion criteria: patients over 18 years of age, of either sex, undergoing exploratory laparotomy at the Chihuahua State Central

Hospital between 2017 and 2018 were included.

Exclusion criteria: subjects who had not undergone exploratory laparotomy or cases in which this was not performed at the State Central Hospital. Patients under 18 years of age or who did not have informed consent issued by the institution signed by the patient where he/she cedes the information of his/her file.

RESULTS

The subjects considered for the study were 126; 40 were excluded based on the exclusion criteria, and 12 were eliminated due to a lack of necessary data in the clinical record. For the study, 74 patients who met the inclusion criteria were selected. The sample size necessary to obtain a confidence level of 95% and power of 80% was calculated as 73 patients.

We found a 17.1% incidence of patients who developed post-incisional ventral hernia during 2019. The mean age was 42 years. A correlation was sought between the development of post-incisional ventral hernias and the factors: sex, age, surgical wound classification, and type of suture used for abdominal wall closure. No statistically significant relationship was found when comparing the incidence of post-incisional ventral hernia and the sex of the person (female, p=0.76, OR: 0.813, 95%CI: 0.216-3.065; male, p=0.76, OR: 1.230, 95%CI: 0.326-4.635). There was no significant difference by suture material used (polypropylene, p=0.484, OR: 2.292, 95%CI: 0.212-24.801; polydioxanone, p=1.204, OR: 0.405, 95%CI: 0.077-2.120; vicryl, p=0.458, OR: 1.742, 95%CI: 0.397-7.643). The rest of the results are shown in *Table 1*.

DISCUSSION

In this series, we found an incidence of 17.1% of patients who developed ventral hernia, consistent with that reported in the literature, ranging from 5 to 20%.[1,2]

Most patients were male (63.3%), but no statistically significant difference was found concerning females. Most of the subjects who developed post-incisional ventral hernia were in the 18-30 and 44-56 age ranges. It is important to note that, contrary to what is mentioned in the literature, being close to 70

Table 1: Comparison of factors associated with ventral hernia.

	Ventral hernia, n (%)			
	Present	Absent	p	OR (95% CI)
Sex				
Female	4 (36.4)	26 (41.3)	0.76	0.813 (0.216-3.065)
Male	7 (63.6)	37 (58.7)	0.76	1.230 (0.326-4.635)
Age (years)				
18-30	4 (36.4)	26 (41.3)	0.76	0.813 (0.216-3.065)
31-43	0 (0)	10 (15.9)	0.155	1.208 (1.080-1.350)
44-56	4 (36.4)	14 (22.2)	0.313	2.000 (0.511-7.828)
57-69	1 (9.1)	8 (12.7)	0.736	0.688 (0.077-6.114)
> 70	2 (18.2)	5 (7.9)	1.148	2.578 (0.433-15.345)
Suture				
Prolene	1 (11.1)	3 (5.2)	0.484	2.292 (0.212-24.801)
PDS	2 (22.2)	24 (41.4)	1.204	0.405 (0.077-2.120)
Vicryl	6 (66.7)	31 (53.4)	0.458	1.742 (0.397-7.643)

PDS = polydioxanone. OR = *odds ratio*. CI = confidence interval.

years of age or older than 70 did not increase the incidence of hernias.[1,2]

Regarding the material used for wall closure, the most used in our institution is vicryl used in 53.4% of cases, followed by polydioxanone (41.4%) and prolene (5.2%). Although the percentage of recurrence was lower in the case of polydioxanone, the probability value calculations did not show a significant value to be able to conclude that any material is more effective in this study, contrary to the literature that mentions greater efficacy of closure when using polydioxanone.[10]

No statistical significance was found when analyzing the rest of the risk factors.

Among the study's considerations, we must take into account the surgical technique used for closure, the surgeon who performed it, and his experience with the procedure; however, the study's objectives were met since the incidence of post-incisional ventral hernias or abdominal eventrations in our environment and their relationship with the risk factors and suture material used were defined.

CONCLUSIONS

The incidence in our setting is like that described in the literature.[1,2] No statistically significant relationship was found between the variables analyzed; a possible explanation for this is that the appearance or development of post-incisional hernias could be an outcome that depends on the surgeon's expertise and experience.[26]

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Video laparoscopic appendectomy in patients over 60 years old

Apendicectomía videolaparoscópica en pacientes mayores de 60 años

Ricardo Suárez-Uria,* Edgar Elvis Craig-Hall,‡ Raúl González-Moner*

Keywords:
acute appendicitis, elderly, video laparoscopic surgery, postoperative complications, hospital stay.

Palabras clave:
apendicitis aguda, adulto mayor, cirugía videolaparoscópica, complicaciones postoperatorias, estadía hospitalaria.

ABSTRACT

Introduction: acute appendicitis is one of the most frequent diseases that have always affected human beings. It is estimated that 8% of people in Western countries present appendicitis at some time in their lives. The risk of acute appendicitis after 60 years of age is 1:35 for women and 1:50 for men. **Objective:** to describe the evolution of patients over 60 who underwent video laparoscopic appendectomy. **Material and methods:** a prospective-observational case series study was carried out on patients over 60 who underwent appendectomy by video laparoscopic surgery. **Results:** appendectomy in patients over 60 was more representative in patients between 60 and 65. The hospital stay was between 24 and 48 hours due to the phase in which the surgeon classified the nosologic entity. **Conclusions:** appendectomy by video laparoscopic surgery in the elderly had greater effectiveness in using surgical resources, shorter hospital stays, and postoperative complication rates. The video laparoscopic approach is suggested as the treatment of choice for acute appendicitis in the elderly population.

RESUMEN

Introducción: *la apendicitis aguda es una de las enfermedades más frecuentes que han afectado, desde siempre, al ser humano. Se calcula que 8% de las personas en los países occidentales presentan apendicitis en algún momento de su vida. El riesgo de apendicitis aguda después de los 60 años es de 1:35 para mujeres y 1:50 para hombres.* ***Objetivo:*** *describir la evolución de los pacientes mayores de 60 años a los que se le realizó apendicectomía videolaparoscópica.* ***Material y métodos:*** *se desarrolló un estudio prospectivo-observacional de serie de casos en los pacientes mayores de 60 años a los que se les realizó apendicectomía mediante cirugía videolaparoscópica.* ***Resultados:*** *la apendicectomía en los pacientes mayores de 60 años evidenció una mayor representatividad en las edades entre 60 y 65 años. La estadía hospitalaria fue entre 24 a 48 horas debido a la fase en la que el cirujano clasificó la entidad nosológica.* ***Conclusiones:*** *la apendicectomía mediante cirugía videolaparoscópica en el adulto mayor presentó una mayor efectividad en el empleo de los recursos quirúrgicos, menor estadía hospitalaria y tasa de complicaciones postoperatorias. Se sugiere el abordaje videolaparoscópico como tratamiento de elección en la apendicitis aguda en la población del adulto mayor.*

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INTRODUCTION

Acute appendicitis is one of the most frequent diseases that has affected human beings since time immemorial. It is estimated that 8% of people in Western countries develop appendicitis at some time in their lives.[1,2] The risk of acute appendicitis after the age of 60 is 1:35 for women and 1:50 for men. Currently, despite advances in medicine, the morbidity and mortality of acute appendicitis in this group of people remain high.[3]

Clinically, the classic picture of acute appendicitis appears in only a quarter of the patients.[4] Generally, the clinical picture has a more insidious onset, with attenuated symptoms, so diagnostic errors are frequent.[5]

According to the World Health Organization (WHO), persons between 60 and 74 years of age are considered elderly; 75 to 90 years of age are considered old; and those over 90 years

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of age are called grand old or grand longevity. Any individual over 60 will be referred to indistinctly as a senior citizen.[6]

Elderly patients constitute a high-risk group because complication rates increase directly proportional to age.[7-9] This is basically due to three factors: poor physiological reserve, concomitant presentation with associated medical diseases, and high incidence of appendiceal perforation at the time of surgery.[10]

Since the introduction of video laparoscopic appendectomy, and despite the reported advantages over laparotomy, there have been controversies surrounding its systematic use.

The traditional approach has been the access route of choice since it was described by McBurney in 1889 and until 1983, when Kurt Semm performed video-laparoscopic appendectomy as a new alternative. This is the established technique for treating acute appendicitis in many hospitals today.

Video laparoscopy is a technique for viewing the pelvic-abdominal cavity using video television equipment. Light is transmitted through an optical fiber on one side to illuminate the cavity, while interior images are observed with a camera connected to the same television socket.

Video laparoscopy highlighted the need to insufflate air into the cavity to be explored to achieve sufficient space to prevent injury to the underlying organs. In this sense, from 1918 onwards, Goethe developed safer needles, and Veres, in 1932, used the trocar of his name, incorporating springs that protected the bevel of the needle from pneumoperitoneum, thus avoiding visceral punctures. He published his work in 1938, and its initial application was to perform therapeutic pneumothorax in tuberculosis patients.[11-13]

The diagnosis of acute abdomen is based on an adequate anamnesis and physical examination supported by laboratory and imaging studies. Sometimes, these are insufficient, and video laparoscopy plays an essential role since it avoids an unnecessary laparotomy and can be used simultaneously as a therapeutic procedure. This technique makes it a good option for the etiological diagnosis and adequate treatment of acute surgical abdomen. However, it is an invasive method that is not free of complications, so its indication should be established at the appropriate time, without replacing clinical examination at regular intervals, a well-established principle for surgical diagnosis.[14]

The advantages of emergency video laparoscopic surgery include the following: unlimited access to all organs in the abdominal cavity, less likelihood of postoperative complications, reduced pain and paralytic ileus and intra-abdominal adhesion formation, shorter hospital stay, rapid return to work and social life, and excellent cosmetic results.[14-20]

MATERIAL AND METHODS

We report a prospective observational case series study in patients over 60. The universe was constituted by all patients with a diagnosis of acute appendicitis who underwent appendectomy by video laparoscopic surgery in the General Surgery Service of the Clinical Surgical Hospital «Lucía Íñiguez Landín» of Holguín from January 2014 to December 2015.

Inclusion criteria: all patients over 60 who underwent video laparoscopic appendectomy were included.

Exclusion criteria: patients with ASA IV or V anesthetic risk. Patients with chronic comorbidities: heart failure, chronic renal failure, chronic respiratory failure, chronic liver disease, hypothyroidism, hyperthyroidism, diabetes mellitus, and obesity. And patients with an appendicular plastron were all excluded.

Obtaining the information: The author prepared a model to collect data from medical records and patient interviews. The operative reports were also reviewed.

Tables and graphs were prepared from the results obtained for analysis, discussion, and interpretation.

The following variables were collected for the study: 1. Age (continuous quantitative variable). 2. Surgical time (discontinuous quantitative variable). 3. Evaluation of postoperative pain according to the verbal-numerical scale (VNS) (nominal qualitative variable). 4. Hospital stay (continuous quantitative variable). 5. Postoperative complications (nominal qualitative variable).

Statistical analysis: the data were processed in the Microsoft Excel program, which allowed us to organize them using qualitative (nominal and ordinal) and quantitative (ratio and proportion) scales according to the variables used. The results were expressed in whole numbers and percentages in simple double-entry distribution tables.

RESULTS

The video laparoscopic surgery applied in appendectomy patients over 60 showed a higher representation in patients between 60 and 65, reflecting 45.83% of the universe *(Table 1)*.

Table 2 shows the surgical time required to perform appendectomy by video laparoscopy. A predominance was observed between 31 and 60 minutes of surgical time, representing 75% of the total number of patients and about the anatomical variants of the cecal appendix.

Table 3 shows the evaluation of postoperative pain using the verbal-numerical scale (VNS). Mild pain was the most common, recorded in 83.33% of the cases. Only 16.67% suffered moderate pain, which subsided with light analgesia.

The length of hospital stay is shown in *Table 4*. It may be seen that 45.83% of the patients who underwent surgery remained hospitalized between 24 to 48 hours due to the phase in which the surgeon classified the nosologic entity since, in general, uncomplicated appendicitis with a short stay predominated. In four (16.67%) cases, there was a hospital stay of 49 to 72 hours related to institutional factors or the patient's geographical location. Another four (16.67%) had a hospital stay of more than 72 hours because, during the surgical procedure, complicated appendicitis was found.

Table 5 shows the postoperative complications of this type of surgery. A low percentage of postoperative infection was observed, evidenced in the immediate postoperative period, representing only 4.16% of the patients who underwent surgery.

Table 1: Age groups.

Age (years)	Video laparoscopic surgery n (%)
60 to 65	11 (45.8)
66 to 70	9 (37.5)
71 to 75	4 (16.6)
76 to 80	0
Over 80	0
Total	24 (100.0)

Source: medical records.

Table 2: Surgical time.

Surgical time (minutes)	Video laparoscopic surgery n (%)
Less than 30	6 (25.0)
31 to 60	18 (75.0)
61 to 120	0
Over 120	0
Total	24 (100.0)

Source: medical records.

Table 3: Postoperative pain according to the verbal-numerical scale (VNS).

Pain assessment	Video laparoscopic surgery n (%)
None (0)	0
Mild (1-3)	20 (83.33)
Moderate (4-6)	4 (16.67)
Severe (7-10)	0
Total	24 (100.00)

Source: medical records.

DISCUSSION

Acute appendicitis is the most frequent acute abdominal inflammatory condition among

surgical entities worldwide and is very difficult to diagnose at the extreme ages of life. The advent of video laparoscopic surgery, while providing an accurate diagnosis, allows performing appendectomy with established technical principles. However, some detractors argue that there are no studies that show that the results of this surgery are significant in comparison to newly trained residents, who perform appendectomy through a small aesthetically acceptable incision, with minimal complications and short hospital stay.[1-4]

The age *(Table 1)* that predominated in our study coincides with that reported in the national and foreign literature.[5,6]

The predominant surgical time *(Table 2)* ranged between 31 and 60 minutes: 75% for those operated by video laparoscopic surgery; the average was 43.8 ± 18.9 minutes. Vallejos[7] reports a surgical time between 15 and 60 minutes for appendectomies. Luzardo[8] reports an average of 45 minutes for video laparoscopic surgery, and Morales[9] an average of 60.5 minutes. According to the literature reviewed, surgical time depends not only on the anatomical position of the cecal appendix and the preoperative evolution time -which is closely related to the anatomopathological status of the morbid process, especially on the experience of the entire team performing the appendectomy.[12,13]

Postoperative pain was defined through the EVN *(Table 3)*. In this series, mild pain predominated in 83.33% of the operated cases, comparable to that recorded in the randomized studies of Moazzez A,[14] in which a high prevalence of analgesia is reported. Ferrarese and Martino[15,16] used other scales, such as the FLACC, used in pediatric ages to discern postoperative pain through extraverbal expression, assigning a score of two points to each acronym collected.

Table 4: Hospital stay.

Stay (hours)	Video laparoscopic surgery n (%)
Less than 24	5 (20.83)
24 to 48	11 (45.83)
49 to 72	4 (16.67)
Over 72	4 (16.67)
Total	24 (100.00)

Source: medical records.

Table 5: Postoperative complications.

Complications	Video laparoscopic surgery n (%)
Port infection	1 (4.16)
Respiratory diseases	0
Residual peritonitis	0
Total	1 (4.16)

Source: medical records.

In this series *(Table 4)*, 45.83% of the patients operated by video laparoscopic surgery had a hospital stay between 24 and 48 hours; this coincides with the studies carried out by Frutos and Abrisqueta[16] from Spain in which there was a close relationship between the hospital stay of the patients and the anatomopathological status of acute appendicitis, which emphasizes the importance of early diagnosis and immediate treatment to prevent postoperative complications, with the consequent decrease in hospital stay time and the unfavorable socioeconomic repercussions of this.

One postoperative complication *(Table 5)* represented 4.16% of the total operations in this casuistry. Port infection occupied the first place. Masoomi,[17] in a retrospective analytical study, agrees that the rate of complications was lower in appendectomy performed by video laparoscopic surgery in older adult patients than in those performed with conventional surgery; he determined that video laparoscopic appendectomy can be performed safely with significant advantages compared to open appendectomy in older adult patients and should be considered the

treatment of choice for acute appendicitis in these patients.[17-20]

CONCLUSIONS

Appendectomy by video laparoscopic surgery in the elderly presented greater effectiveness in the use of surgical resources, shorter hospital stays, and a lower rate of postoperative complications. The video laparoscopic approach is suggested as a treatment for appendicitis in the elderly population.

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Locoregional recurrence of breast cancer in patients with conservative surgery and radical surgery

Recurrencia locorregional de cáncer de mama en pacientes con cirugía conservadora y cirugía radical

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Keywords: recurrence, breast cancer, conservative surgery, mastectomy.

Palabras clave: *recurrencia, cáncer de mama, cirugía conservadora, mastectomía.*

ABSTRACT

Introduction: locoregional recurrence after breast cancer surgery occurs most of the time in the first five years after treatment, and its occurrence is related to the development of distant disease in a subgroup of patients, which determines a worse prognosis. **Objective:** to evaluate the prevalence of locoregional recurrence of breast cancer in mastectomized patients and conservative surgery. **Material and methods:** a descriptive, retrospective case series study was carried out, with clinical, humoral, and imaging analysis in patients with breast cancer recurrence in five years plus a literature review. The purpose was to analyze the type of surgery, recurrence, and clinical and imaging data most frequently associated with this disease and treatments. **Results:** the highest number of patients with a high recurrence rate was in clinical stage IIIB, located mainly in the right breast. Radical surgery, with 18 cases, was the most frequent, mainly after four years. **Conclusion:** the appearance of a recurrence of breast cancer is considered an adverse prognostic factor and decreases the survival rate in patients.

RESUMEN

Introducción: *la recidiva locorregional, luego de una intervención quirúrgica por cáncer de mama se presenta la mayoría de las veces en los primeros cinco años después del tratamiento y su aparición está relacionada con el desarrollo de enfermedad a distancia en un subgrupo de pacientes, esto determina un peor pronóstico.* ***Objetivo:*** *evaluar la prevalencia de la recurrencia locorregional de cáncer de mama en pacientes mastectomizadas y cirugía conservadora.* ***Material y métodos:*** *se realizó un estudio descriptivo, retrospectivo de serie de casos, con análisis clínico humoral, de imágenes, en pacientes con recurrencia de cáncer de mama en un periodo de cinco años más revisión de la literatura. La finalidad fue analizar el tipo de cirugía, su recurrencia, los datos clínicos y de imagen más frecuentemente asociados a dicha enfermedad, además de los tratamientos.* ***Resultados:*** *la mayor cantidad de pacientes con índice elevado de recidivas fue en la etapa clínica IIIb, localizados fundamentalmente en la mama derecha. La cirugía radical con 18 casos fue el de mayor aparición, fundamentalmente después de los cuatros años.* ***Conclusión:*** *la aparición de una recurrencia del cáncer de mama es considerada como un factor pronóstico adverso y disminuye el índice de supervivencia en las pacientes.*

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INTRODUCTION

Breast cancer is the accelerated, disordered, and uncontrolled proliferation of cells with mutated genes, which generally suppress or stimulate the continuity of the cell cycle belonging to different tissues of a mammary gland.[1]

Breast cancer is the most frequent malignant tumor in women, especially in Western countries. There has been a progressive increase in incidence in recent years, which is more significant among women under 40. The World Health Organization reports that about one in 12 women will develop breast cancer during her lifetime, and it is currently the leading cause of death in women.[2]

Breast pathology has been known to humankind since ancient times. The Ancient Egyptians were the first to observe the disease more than 3,500 years ago. The condition was described in the papyri of Edwin Smith and George Ebers. Smith was the first to describe breast cancer, and Ebers was the first to perform a breast tumor resection. In 460 BC, Hippocrates described in his book "Diseases of Women" nipple discharge as a late sign of breast cancer and postulated that the body consisted of four humors: blood, phlegm, yellow bile, and black bile.[3] Frenchman Francois de la Boe Sylvius later refuted this in 1680, who presumed that cancer did not come from an excess of black bile. He proposed that cancer came from a chemical process transforming the lymphatic fluids from acidic to acrid.[3]

Galen (2nd century) described breast cancer as looking like a "crab" whose legs corresponded to the veins emerging from the tumor. This description is probably the origin of the name "cancer". He explains that only by being operated on in the early stages when it is small is there a possibility of a cure.[2]

William Halsted of New York made radical breast surgery the gold standard for the next 100 years. He developed radical mastectomy, removing the entire breast, axillary nodes, and both chest muscles as the only procedure to prevent the spread of breast cancer.[2]

This procedure has been perfected up to the present day, where Auchincloss and Madden (1972) introduced the current technique of modified radical mastectomy, with preservation of both pectoral muscles and complete or partial axillary lymph node dissection.[3]

Breast cancer, in which cancerous cells develop in the tissues of the breast, is the most frequent neoplasm in women worldwide, responsible for approximately one of the 10 million neoplasms diagnosed each year in both sexes.

The incidence rate is highest in developed countries (except Japan), with the United States having the highest incidence. It is the second leading cause of cancer-related death among women in North America and Western Europe; 13% of American women will be diagnosed with this type of neoplasm during their lifetime, and more than 3% will die of this disease, representing more than 400,000 deaths per year. It is already ironic that a malignancy that arises in an organ that is so easily accessible for examination continues to take such a high toll.

In 2021 in Cuba, malignant tumors were the second leading cause of death, with 10,967 deaths, where breast cancer ranked third after ischemic heart disease and cerebrovascular diseases, with 965 deaths and the first cause among malignant tumors diagnosed in that year in patients under 70 years of age. It ranked second overall among all malignant tumors after lung cancer, with a total of 1,904 deaths. In Holguín city, it was the second cause of death after heart disease in terms of morbidity; 2,475 new cases were detected, being the fifth province in the country, after Pinar del Río, Artemisa, Havana, and Villa Clara, with the highest number of cancer cases in women in 2021.[4]

Its early detection is the pillar of the fight against this disease since it aims to improve the prognosis and survival of patients. It has been demonstrated that the survival rate of women diagnosed in early stages is 2.5 times higher than those diagnosed in more advanced stages.[5] Breast cancer does not appear suddenly; it takes years to develop slowly and progressively after a series of

multiple biochemical changes that cause normal cells to transform into cancerous cells. The long time that elapses for the growth of a malignant tumor in the breast offers us a window of opportunity for early detection of this disease.[6]

Multidisciplinary surgical, medical, radiotherapeutic, and hormonal treatment achieves excellent cure rates. However, often, the diagnosis of breast tumor recurrence is more devastating or psychologically tricky than the initial diagnosis of breast cancer. However, depending on the stage of the disease and the treatment administered, between 10 and 35% of women experience an isolated locoregional recurrence.[7,8] About 80% of these recurrences occur during the first two years after primary treatment, which is why it has become a significant health problem, as it is one of the leading causes of morbidity and mortality in the female population and the trend is expected to increase in the coming years.[9]

The appearance of locoregional recurrence in patients with breast cancer treated conservatively or by radical surgery may not be determined by its presence alone, meaning that a decrease in survival is an event that, in addition to being a therapeutic failure, causes the patient and the surgeon a situation of intense anguish, assisting the recurrence of the disease at the same site.[6]

Recurrent breast cancer may occur months or years after the initial treatment. The cancer may come back in the same place as the initial cancer (local recurrence), or it may spread to other parts of the body (distant recurrence).[9]

It is also important to point out that there has been a significant advance in medical and surgical treatment since it is now individualized and based on the patient's stage at the time of diagnosis. In the past, radical surgery was performed to minimize the possibility of recurrence of the disease; in recent years, it has been demonstrated that conservative surgery offers approximately the same chances of survival to the patient and with less aggression to the tissues and, consequently, less psychological impact and better response to the patient's treatment. Breast-conserving surgery is defined as the complete resection of the tumor with a concentric margin of healthy tissue, performed cosmetically acceptable.[7] In appropriately selected patients, it is equivalent to mastectomy in terms of recurrence and survival.[8,9] In Holguin, there are few reports of recurrence of this type of procedure.

Even though breast cancer is not currently perceived as a terminal disease but as a chronic process of long duration, statistics confirm that it is a severe threat to women because of the sequelae it produces, the consequent deterioration of their personal, family, and work life, with significant costs, since its incidence is high in an age group in which women are economically active and at a stage of life of formation and development of their own family.[9]

In Cuba, and especially in Holguin, different types of breast cancer treatment are carried out, such as radiotherapy, chemotherapy, hormone therapy, immunotherapy, and surgery, since there are few studies where the recurrence of breast cancer in patients operated on in our province is known.

The author of this paper considers that despite the efforts made by our country, especially in our province, to maintain a high standard of living for its inhabitants, the scientific evidence on this subject is scarce. This prevents us from carrying out a more detailed review of the recurrence of this disease in the province's teaching scenarios, updating our knowledge, and performing a better follow-up of this entity.

RESULTS

Examination of the available literature describes apparent differences in the pattern of breast cancer recurrences depending on the type of surgery performed, whether a modified radical mastectomy or conservative surgery and the adjuvant provided so that in the present study, we had a higher incidence of breast tumor recurrences in patients who underwent radical mastectomy than in those who underwent conservative surgery. We believe that this could be related to the fact that the universe of patients treated

Table 1: Distribution according to age and sex.

Age, years	Sex		Total n (%)
	Male	Female	
20-39	0	50	50 (6.3)
40-59	1	195	196 (24.7)
60-79	4	280	284 (35.7)
80 and over	0	265	265 (33.3)
Total	5	790	795 (100.0)

Source: medical record.

had more advanced stages of the disease (stages II and III), which contributed to its recurrence.[10-12]

Table 1 shows the distribution of patients according to age, where a predominance was observed between 40 and 59 years of age, followed by those between 60 and 79 years of age, which represented 47.05 and 35.29%, respectively, in general accumulating the highest percentage in those between 40 and 79 years of age, where 82.34% of the patients studied were found.

This study is not different from the literature concerning sex and age. Again, it shows that the ages between 40 and 59 years have the highest incidence rates and that women are more likely to suffer from breast cancer, which mutilates their productive life at a social and psychological level and can cause death, which is why it is considered a severe health problem that has led to determine the recurrence of breast cancer.

The incidence of locoregional recurrences for breast cancer in our universe was 3.14%, as shown in *Table 2*. The incidence of locoregional recurrences in breast cancer is highly variable depending on the stage of the disease and the treatment administered. Between 10 and 35% of women experience an isolated locoregional recurrence.[13] In our study, we had only 3.14% locoregional recurrences, possibly due to the high percentage of radical mastectomies performed. Bergamo[13] reports that only 2% of 167 cases were operated with radical surgeries for one year and followed for 36 months. On the other hand, Spinetti D and collaborators[14] report 14.8% local recurrence and 27% distant recurrence at ten years, with periodic follow-up.

According to the clinical stage of diagnosis, the greatest number of cases was diagnosed in stage II, as shown in *Table 3*, with 440 patients who did not relapse. The same occurred with stage III patients who did relapse, with a total of 21 patients representing 84%. Only four patients who relapsed were diagnosed with stage II of the disease, which represented 16% of the total number of relapses.

Similar findings were observed in other studies, such as that of Silvina Malvasio[15] and collaborators, where the distribution by stage was as follows: stage I 23 patients (21.5%); stage II 47 patients (44%); stage III 33 patients (31%), and stage IV four patients (3.5%). The author of this research thinks that the increase in stage III recurrences is because the patients are coming late to the established medical consultations.

Regarding the histological type, as shown in *Table 4*, similarities were found with what was reported regarding breast cancer in different studies, where the infiltrating ductal histological type predominates. In 2017, a study conducted in Mexico City showed similar results, where this histological type was the most prevalent at 80.13%.[16] Similar data were found in other studies performed.[17,18] In this study, infiltrating ductal carcinoma was propitious, and the highest percentage of locoregional recurrence was found at 44%.

As can be seen in *Table 5*, the more significant number of patients diagnosed with breast cancer and operated on have a greater location in the upper external quadrant, which agrees with other studies; it was more frequent in the right breast, which represented 60% of the total. These results differ slightly in the study carried out by Dr. Diosdado Cruz del Pino[19] in Holguin Province in 2010, where left breast cancer predominated, despite carrying out the study in the same province, where also in these last years of the study no tumor was found in the

axillary projection; there were no patients who had been diagnosed with cancer in the contralateral breast, that is, all the patients who participated in the study had cancer only in one breast.

According to different authors, the average time to recurrence is within the first two years of follow-up in 80-90% of cases.[14,20]

The recurrence rate at five years after surgery is highly variable. The incidence following modified radical mastectomy ranges from 3 to 48%.[21] In the present investigation, the overall incidence of recurrence was 3.14%, as explained in *Table 2*. Some authors report in an extensive review that the incidence of recurrence ten years after mastectomy is 13% and that 35% of these cases present synchronous systemic disease.[21] Nine to 25% of these cases will have distant metastases or extensive disease at the time of diagnosis of recurrence.[22,23]

In the present study, the time of onset of recurrence showed that four patients (16%) relapsed before 24 months, nine patients (36%) between 24 and 48 months, and 12 patients (48%) after 48 months, very similar to studies carried out in other countries, as shown in *Table 6*.

It is essential to point out that four of the five recurrences had a modified radical mastectomy as a previous surgery, representing 80% of the recurrences. As seen in *Table 7*, modified radical mastectomy prevailed with 81.37%. Modified radical mastectomy still has an essential place in the primary treatment of breast carcinoma.

Table 2: Recurrences in operated patients.

	Sex		Total n (%)
	Male	Female	
With recurrences	1	24	25 (3.14)
No recurrences	4	766	770 (96.86)
Total	5	790	795 (100.0)

Source: medical record.

Locoregional relapse after mastectomy varies widely from 5 to 40% in the literature.[24,25] In the present work, we had a higher incidence of breast tumor recurrence in patients who underwent radical mastectomy than in those who underwent conservative surgery. We believe that this could be related to the fact that the universe of patients treated had more advanced stages of the disease (II and III), which contributed to the recurrence of the disease.[26]

This result differs from the studies of Veronesi and Fisher, which suggest a slight increase in local recurrences in cases of breast-conserving surgery, with no change in overall survival or disease-free interval. Regardless of the technique to be used, whether radical or breast-conserving, the negativity of the surgical section border is a fundamental principle in all oncological surgery.[15] In recent years, this has been a much-debated topic by different authors such as Sheik,[12] Sabel[27] and Borgen.[28]

DISCUSSION

Breast cancer is the primary malignant pathology in women, which, due to its multiple etiological factors, has become an epidemiological problem in women of increasingly younger ages and is prevalent in older women. In addition, inadequate diagnosis due to delay or quality of the diagnostic process itself is reflected in the patient's prognosis.[29]

Breast cancer is a systemic disease in which breast tissue cells begin to form malignant tissues with a capacity to metastasize to neighboring tissues or distant organs of the body. A breast cancer cell doubles every 100-300 days. The 1 cm breast neoplasm makes about 30 duplications before reaching this size, so this cancer has at least seven years of evolution. This simple estimate shows us the usefulness of early detection, with diagnostic methods capable of visualizing (subclinical) alterations of less than one centimeter in size.[10,30] Thus, we can prevent possible future locoregional recurrences.

Local recurrence can be defined as the reappearance of the cancer either in the

Table 3: Relapses according to clinical stage.

Stage	Relapse		Total n (%)
	No n (%)	Yes n (%)	
0	15 (1.94)	–	15 (1.94)
IA	93 (12.39)	–	93 (12.39)
IB	11 (1.42)	–	11 (1.42)
IIA	260 (33.7)	3 (12)	263 (33.1)
IIB	180 (23.3)	1 (4)	181 (22.8)
IIIA	97 (12.5)	3 (12)	100 (12.5)
IIIB	102 (13.2)	18 (72)	120 (14.3)
IIIC	12 (1.55)	–	12 (1.55)
Total	770 (100.0)	25 (100.0)	795 (100.0)

Source: medical record.

Table 4: Distribution of patients according to histologic variant.

Histological variant	Sex		Total n (%)	Relapses n (%)
	Male	Female		
Ductal carcinoma *in situ*	1	210	211 (26.5)	7 (28)
Infiltrating ductal carcinoma	3	422	425 (53.4)	11 (44)
Infiltrating lobular carcinoma	–	45	45 (5.6)	3 (12)
Medullary carcinoma	–	32	32 (4.1)	1 (4)
Metaplastic squamous cell carcinoma	–	39	39 (4.9)	2 (8)
Other histological variants	1	42	43 (5.5)	1 (4)
Total	5	790	795 (100.0)	25 (100)

Source: medical history.

operated breast, in the operative scar, or the skin covering the rib cage after surgery. Regional recurrence is the anatomical situation in which the tumor involvement invades the axillary, infraclavicular, ipsilateral supraclavicular, or internal mammary chain nodes.[31,32]

In 2016, Elsayed et al. published an article in which 238 patients who underwent conservative surgery were studied. After five years of follow-up, 16 patients (6.72%) had locoregional recurrence, while ten patients (4.2%) had distant recurrence.[28] In 2016, Choi and his group released the results of a study that included 322 patients; the follow-up period was 57 months. During this time, 19 patients (5.9%) had a recurrence in the ipsilateral breast, and six patients had a recurrence in the contralateral breast.[17,33] In 2015, Manning and Sacchini concluded an analysis involving 413 patients, with an average follow-up of 49 months, who underwent nipple-sparing mastectomy; 402 of 413 were alive with no evidence of disease. Four patients died, one with regional and distant recurrence 15 months after surgery.[14] In 2016, Warren et al. reported a study that included 753 patients with nipple-sparing surgery, with a follow-up

Table 5: Location of the primary lesion and specific location.

Specific location	Location of lesion (breast)	
	Right	Left
Quadrant:		
Superior external	4	4
Lower internal	5	2
Superior interno	2	1
Lower external	3	2
Central or retroareolar	1	1
Axillary projection	0	0
Total	15	10

Source: medical record.

Table 6: Distribution of cases according to time elapsed between initial diagnosis and the onset of recurrence.

Time to onset of recurrence	Sex		Total n (%)
	Male	Female	
Before 2 years	0	4	4 (16)
From 2 to 5 years old	1	8	9 (36)
More than 5 years	0	12	12 (48)
Total	1	24	25 (100)

Source: medical record.

Table 7: Surgical technique used.

Technique used	Sex		Total n (%)
	Male	Female	
Conservative surgery	0	6	6 (24)
Radical mastectomy	1	18	19 (76)
Total	1	24	25 (100)

Source: medical record.

of 41 months where there was a recurrence prevalence of 5%.[34]

These results coincide with those of Professor Soler Vaillant,[25] who indicates a higher incidence between 45 and 60 years of age, with the highest contribution of data to the research work carried out. Other authors, such as Kelly K. Hunt and Elizabeth A. Mittendorf, both from the Department of Oncologic Surgery of the University of Texas,[35,36] differ slightly in these results, showing a higher incidence between 75 and 85 years of age, which in the present work only represented 14.70% of the patients studied.

Many studies in Mexico found an analogous result: the histological type that prevailed in their study was infiltrating ductal carcinoma for 89% of the cases.

Between 80 and 90% of recurrences appear in the first five years after surgery, and the remaining 10% appear between five and 10 years after surgery.[21] Other studies indicate that between 10 and 20% of patients will have recurrent disease in the breast between one to nine years after conservative surgery and radiotherapy.[18] When analyzing this information, we observed that the periods and the percentage of recurrence prevalence are very similar to that found in our research.

CONCLUSIONS

As was seen in the study, patients in the 60-79 age group predominated, with 284 patients for 35.7%; of these, 280 patients were female; there were also 25 patients with recurrences out of 795, representing 3.14%. Stage IIIb was predominant in the preoperative stage for 72%, which led to modified radical mastectomy being the most frequently performed surgical intervention in 19 patients for 76%, where the most frequent histological type was infiltrating ductal carcinoma. Most of the patients had a relapse after more than five years, with a more significant localization towards the right breast. The occurrence of breast cancer recurrence is considered an adverse prognostic factor and decreases the survival rate in patients.

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Concealed penis in a giant inguinoscrotal hernia

Pene oculto en hernia inguinoescrotal gigante

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Keywords:
hernia, abdominal hernia, penis, scrotum, hernia surgery, male genitalia.

Palabras clave:
hernia, hernia abdominal, pene, escroto, cirugía de hernia, genitales masculinos.

ABSTRACT

Introduction: giant inguinoscrotal hernia is an entity that an acquired occult penis can accompany; the combination of these two entities demands additional management to hernioplasty. The adequate approach is transcendental due to the urological and psychological complications associated with an occult penis. **Case report:** we report the case of a 43-year-old male patient with a giant inguinoscrotal hernia reaching the mid-thigh, accompanied by an occult penis. A mesh repair was performed conventionally using the Lichtenstein technique, followed by scrotoplasty with subsequent release of the dartos and suspensory ligament of the penis. There were no postoperative complications. **Conclusions:** combining these two entities has a significant psychological impact on patients. The general surgeon who performs abdominal wall surgery should know about the management of the occult penis for its treatment in conjunction with inguinoscrotal hernioplasty.

RESUMEN

Introducción: *la hernia inguinoescrotal gigante es una entidad que puede acompañarse de un pene oculto adquirido; la combinación de estas dos entidades demanda un manejo adicional a la hernioplastía. El abordaje adecuado es trascendental debido a las complicaciones urológicas y psicológicas que conlleva el pene oculto.* ***Caso clínico:*** *paciente masculino de 43 años con una hernia inguinoescrotal gigante que llega al punto medio del muslo acompañada de un pene oculto. Se efectúa una reparación con malla de manera convencional, empleando la técnica de Lichtenstein; posteriormente, se realiza una escrotoplastía, con subsiguiente liberación del dartos y el ligamento suspensorio del pene. No se presentaron complicaciones postquirúrgicas.* ***Conclusiones:*** *la combinación de estas dos entidades tiene una repercusión psicológica significativa en los pacientes. El cirujano general que realiza la cirugía de pared abdominal debe tener el conocimiento sobre el manejo del pene oculto para su tratamiento en conjunto con la hernioplastía de hernias inguinoescrotales.*

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INTRODUCTION

The concealed penis in the adult is an entity commonly observed in patients with obesity and the presence of large inguinoscrotal hernias. In general, the corpora cavernosa and glans penis are typical (in length). However, the penis is hidden by an excess of suprapubic fat, as well as a lack of fixation of the penopubic and penoscrotal angles.[1] The hidden penis is divided into membranous (alteration in the attachment of the scrotal skin to the penis), buried (excessive fat at the suprapubic level with a defect in the elasticity of the dartos), and trapped (secondary to scarring following a procedure in the area).[2] Due to this entrapment of the penis, together with the loss of visibility, the complications generated are altered urination, recurrent infections (bacterial or fungal), erosion or ulcers in the region, and sexual dysfunction.[3] This condition produces significant stress, depression, and even suicidal ideation.[4]

Giant inguinoscrotal hernias are those that exceed the midpoint of the inner thigh in patients who are in a standing position.[5] They are classified according to the extension of the hernial sac: type 1 extends just up to the middle portion of the thigh, type 2 extends up to the patella's upper edge, and type 3 goes beyond

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the patella.[6] Complications include difficulty walking ("bouncing ball effect"), occult penis, dermatitis, occult and recurrent infection, and scrotal ulceration.[5]

This paper aims to present the management of a patient with an occult penis secondary to a giant inguinoscrotal hernia.

CLINICAL CASE

A 43-year-old male patient attended the outpatient clinic for abdominal wall surgery, with the presence of a mass in the left inguinal region, reporting discomfort and inability to ambulate (the mass "bounces" against the thigh) and occasional pain (tolerable). Upon interrogation, he revealed no relevant history or chronic diseases.

On physical examination, the patient weighed 102 kg, had a height of 1.72 cm, and had a body mass index (BMI) of 35.2 kg/m^2. He had a non-reducible, sizeable inguinoscrotal mass that reached the mid-thigh, with peristaltic noises and no translucency. In addition, an occult penis was observed along its entire length, and the presence of dermatitis in the inguinal region and the abdominal-pubic crease *(Figure 1A)*. He was scheduled for inguinal hernia repair, phalloplasty, and scrotoplasty.

After antibiotic administration (cephalexin, one gram per intravenous route one hour before the procedure), the intervention was performed under regional anesthesia with an epidural catheter; the patient was positioned in dorsal decubitus, a bladder catheter was placed to empty the bladder, and splint the urethra, allowing its identification during the procedure to avoid injury. The inguinal hernia was repaired conventionally with the Lichtenstein technique (modified), reducing the sigmoid colon and the omentum containing the hernia. A lightweight macroporous polypropylene mesh was placed and anchored to the inguinal ligament, Cooper's ligament, and the joint tendon (polyglactin 910, 2-0 gauge). Once the hernia was repaired, the inguinal wound was closed with single and separate stitches (polyglactin 910, 2-0 gauge) in the subcutaneous cellular tissue and single stitches in the skin (polypropylene, 3-0 gauge). Subsequently, scrotoplasty was performed, resecting a spindle of scrotal tissue (longitudinal direction) and giving access to the penis from an inferior approach. Through the incision made in the scrotoplasty, the lax adhesions were released until reaching the base of the penis, freeing the suspensory ligament in the dorsal region and the pubis; fixation stitches (simple and separate) were placed from the dartos to the albuginea of the dorsal and lateral face of the penis (polyglactin 910, 3-0 caliber), creating the penoscrotal and penopubic angles. After fixing the angles and with the release of the suspensory ligament, the penis showed a circumcision-like appearance (due to the deficit of penile skin), leaving the glans uncovered. A prominent penis and elongation were immediately obtained *(Figure 1B)*. The ipsilateral testicle was then fixed to the scrotum at two points (lateral and fundus) with simple stitches (polyglactin 910, 3-0 gauge), and the scrotoplasty incision was closed with inverted stitches (chromic catgut, 3-0 gauge), leaving an open Penrose-type drain located in the scrotal pouch.

The procedure lasted 145 minutes; no complications occurred during or in the immediate postoperative period. Adequate analgesia was obtained with intravenous ketorolac 30 mg every eight hours. The patient was discharged 24 hours after surgery and maintained with urethral catheterization until discharge. The follow-up time was six months, with good aesthetic and functional aspects.

COMMENTS

Giant inguinoscrotal hernias have a prevalence of 2.8-5% of all cases of inguinal hernia,[7] although this figure could be higher in Mexico. This condition is associated with populations in developing countries with a low educational, social, and economic level, which means that patients with this type of hernia delay seeking medical attention, and with this, an increase in the severity of the condition is usually seen.[8] Inguinoscrotal hernias can be so large that they can cause loss of domicile[9] and can bring with them complications that impact the patient's quality of life. Serious complications include intestinal obstruction, peritonitis, intestinal perforation, sepsis, and even death.[10]

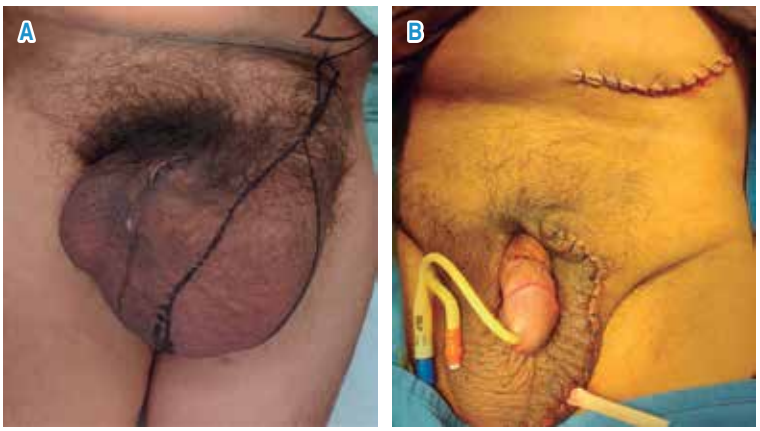

Figure 1: A) *An inguinoscrotal hernia and scrotoplasty marking, showing the penis hidden by the laxity of the scrotal tissue, as well as the scrotal mass conditioned by the hernia, is shown.* ***B)*** *The immediate results of conventional hernioplasty, scrotoplasty, and phalloplasty are shown.*

Correction of the concealed penis in the adult is achieved by releasing the abnormal attachment of the dartos, making new penoscrotal and penopubic angles.[11] We recommend performing in conjunction with the release of the suspensory ligament of the penis (which gives the appearance of greater length), which can also be used on its own as an alternative in unusual cases where the dartos cannot be released.[12] Pubic fat liposuction, pubic dermolipectomy,[13] a suprapubic Z-plasty,[1] and even partial thickness grafting may also be performed.[14]

As part of the postoperative care, patients are advised to avoid sexual intercourse; however, it is recommended not to avoid erections since the inability to have erections is indicative of a failure of the procedure and unsatisfactory results.

In patients with giant inguinoscrotal hernia and hidden penis, there is a psychological impact, so when treating these cases in the hernia and abdominal wall surgery unit, it is necessary to offer the best integral treatment for the patient (correction of the hernia and phalloplasty). The complexity of abdominal wall pathology obliges the general surgeon to specialize in functional and aesthetic reconstruction procedures, improving the patient's quality of life.

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Buschke-Lowenstein tumor

Tumor de Buschke-Lowenstein

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Keywords:
Buschke-Lowenstein tumor, condyloma acuminatum, human papillomavirus, squamous cell carcinoma, giant condyloma.

Palabras clave:
tumor de Buschke-Lowenstein, condiloma acuminado, virus del papiloma humano, carcinoma de células escamosas, condiloma gigante.

ABSTRACT

Giant condyloma acuminatum or Buschke-Lowenstein tumor is a sexually transmitted disease associated with the human papillomavirus, specifically serotypes 6 and 11. Its incidence worldwide reaches 0.1% of the sexually active population, especially in patients with immunosuppression, such as the human immunodeficiency virus. It behaves as a locally aggressive tumor. The gold standard treatment is still surgery. We present a case managed with electrofulguration, wide resection of healthy margins, and postoperative follow-up.

RESUMEN

El condiloma gigante acuminado o tumor de Buschke-Lowenstein se considera una enfermedad de transmisión sexual, asociado al virus del papiloma humano y específicamente a los serotipos 6 y 11. Su incidencia a nivel mundial alcanza el 0.1% de la población con actividad sexual y especialmente en pacientes portadores de algún estado de inmunosupresión como el virus de inmunodeficiencia humana. Se comporta como un tumor localmente agresivo. El tratamiento de referencia sigue siendo la cirugía. Se presenta un caso que fue manejado con electrofulguración con resección amplia de márgenes sanos y seguimiento postoperatorio.

INTRODUCTION

In 1925, German dermatologists Abraham Buschke and Ludwig Lowenstein analyzed patients with penile lesions that they described as condylomas with carcinoma-like features. These lesions are now eponymously attributed to these two men as Buschke-Lowenstein tumors or giant condylomas. Gradually, reports involving other areas of the anogenital region appeared.[1] Giant Buschke-Lowenstein condyloma acuminatum occurs most frequently in men and is transmitted by sexual contact, with an incidence of about 0.1% in the general population.

The incidence of this tumor is higher in homosexual or bisexual men. Low-risk human papillomavirus (HPV) types 6 and 11 are said to be associated with this tumor. It is well known that viral warts become larger and more resistant to treatment when there is altered host immunity, as in acquired disorders such as human immunodeficiency virus (HIV) infection.

This resistance is explained by the fact that the genome of HPV 6 and 11 encodes DNA sequences translated to produce E6 and E7, tumor suppressors that inactivate p53, resulting in uncontrolled replication of epithelial cells, ultimately leading to abnormal growth.[2]

Because of this, condylomas are initially benign and can later develop severe dysplasia and undergo transformation to squamous cell carcinoma.[3] The transformation rate to malignancy is estimated at 56%, but no metastases are reported.[4]

Some authors consider it a low-grade epidermoid carcinoma, while others consider

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it a transitional form between epidermoid carcinoma and condyloma acuminata.[5]

The gold standard treatment remains surgery with healthy excision margins; spontaneous regression is exceptional, and recurrence after incomplete excision is frequent.[6] However, there is no general agreement on treatment options for this tumor because it is an infrequent entity.[7,8]

Surgical management remains the first line of treatment and is recommended by wide local excision, with 1-2 cm margins, and complete evaluation of circumferential, peripheral, and deep margins, if possible.[9]

Local treatments (podophyllin, cryotherapy, electrocoagulation, fluorouracil, CO_2 laser, and even radiotherapy) or the adjuvant use of chemotherapy (bleomycin, methotrexate) have also been described. However, these approaches have yet to reduce the lesion's recurrence successfully.[10]

Follow-up should be the cornerstone after surgery due to its high recurrence rate. Follow-up is recommended every six months after wound healing for the first two years.[11]

Figure 1: *Patient in the operating room in Sevillian razor position, with previous cleansing with iodo povidone. A giant condylomatous lesion is observed in the anal and perianal regions.*

Figure 2: *Condyloma resection with monopolar energy electrocautery covering 20 mm of healthy margins.*

PRESENTATION OF THE CASE

We present the case of a 29-year-old male patient with a history of HIV (+) of 12 years of evolution with antiretroviral therapy, no CD4 T-lymphocyte count, and no viral load. He came for consultation due to a mass in the anal region of 12 months of evolution accompanied, during the last month, by proctalgia and proctorrhagia. Physical examination revealed a giant cauliflower-like tumor located in the anoderm and up to 6 cm outside the anal margin, with a warty surface and bloody discharge. Laboratory studies were taken on admission: hemoglobin 10.80 g/dl, hematocrit 34.60%, platelets 359 $\times$ 10^3/ml, leukocytes 15.13 $\times$ 10^3/ml, with neutrophils 70.56 $\times$ 10^3/ml, lymphocytes 1.44 $\times$ 10^3/ml, creatinine 1.0 mg/dl, urea nitrogen 8.6 mg/dl, urea 18.5 mg/dl, sodium 138 mEq/l, potassium 3.3 mEq/l and chlorine 104 mEq/l. The diagnosis of giant condyloma was established, and surgery was scheduled to perform a wide resection. In the operating room, after the anesthetic block, the anal region and perianal margins were cleaned with iodo povidone *(Figure 1)*.

The giant condylomas were tractioned with Allis forceps, and their resection was started with monopolar energy electrocautery with a margin of 20 mm of macroscopically healthy skin *(Figure 2)*, with subsequent verification of hemostasis. Subsequently, a Pratt anoscope was introduced to evaluate the anal canal; small condylomatous lesions were found, and they were electrofulgurated, ending the surgical procedure.

The specimens were sent for histopathologic study *(Figure 3)*, identifying an exophytic growth

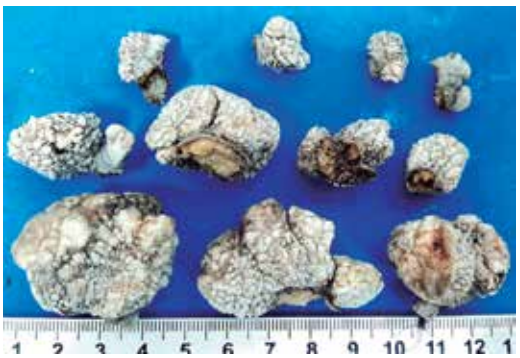

Figure 3: *Macroscopic sections used for histopathological study.*

Figure 4: *Intact basal layer.*

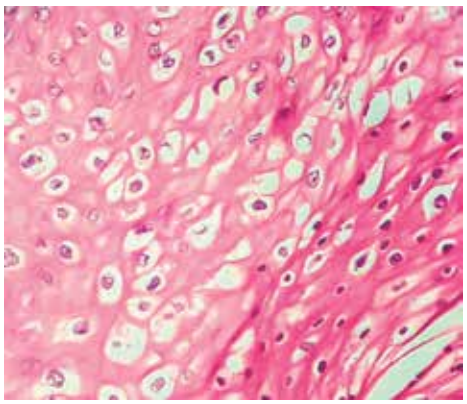

Figure 5: *Cells with vesicular nuclei, clear vascular cytoplasm (coilocytes), and few mitosis figures are identified in the superficial thirds.*

Figure 6: *Perianal region with wide, healthy margins two months after surgical excision.*

pattern in microscopic sections with stratified flat epithelium with significant acanthosis-basal cells with mild hyperchromasia and atypia. The basal layer was intact *(Figure 4)*. In the superficial thirds were cells with vesicular nuclei, clear vascular cytoplasm (koilocytes), and a few mitosis figures *(Figure 5)*. The superficial layer demonstrated a slight increase in keratin lamellae. The fibrous stroma had multiple congestive vessels. According to these findings, the diagnosis of Buschke-Lowenstein disease with low-grade squamous intraepithelial anal lesion AIN 1 was established. The patient was referred to the outpatient clinic two months after the surgical procedure; the perianal region was

adequately healed, with no evidence of new condylomatous lesions or fistulas *(Figure 6)*.

DISCUSSION

Buschke-Lowenstein tumor or giant condyloma acuminatum is a rare, slow-growing verrucous tumor of the anogenital region.[1] It is caused by infection with human papillomavirus, especially serotypes 6 and 11. It has been described that this tumor can progress to severe dysplasia and even undergo transformation to squamous cell carcinoma, especially in patients seropositive for human immunodeficiency virus.[3]

Due to the high risk that this pathological entity has of becoming an intraepithelial neoplasia with evolution to squamous cell carcinoma, in this case, the decision was made to perform a complete resection of the lesions that included anoderm and gluteal skin outside the anal margin, with healthy borders up to 20 mm outside the lesion, which is currently considered the gold standard according to the literature reviewed.[6,9] However, recurrence after surgical management has been reported to vary between 60 and 66%; because of this, some authors have proposed chemotherapy or radiotherapy as adjuvant treatment to surgical management. However, their efficacy has yet to be established.[7] Follow-up after surgical management should be considered the cornerstone, and it has been recommended that a follow-up visit every six months for two years after completing wound healing be performed.[11] This is to detect early recurrences, avoiding more complex medical-surgical treatments.

CONCLUSIONS

The Buschke-Lowenstein tumor or giant condyloma acuminatum is still a rare pathology but with a high risk of transformation to severe dysplasia and even squamous cell carcinoma. In the last review on the subject, it was mentioned that until 2020, only 97 cases of patients published in 55 articles had been reported, so our purpose is to report a new case of Buschke-Lowenstein tumor in order to add one more to the epidemiological report, as well as the surgical management that was implemented of surgical resection of wide margins of healthy skin in order to avoid recurrence.

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Mucinous tumor of the appendix

Tumor mucinoso del apéndice

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Keywords:
cecal appendix, mucinous tumor, appendectomy, appendiceal tumor, surgery.

Palabras clave:
apéndice cecal, tumor mucinoso, apendicetomía, tumor de apéndice, cirugía.

ABSTRACT

The mucinous tumor has a very low incidence, reported in 0.2% of appendectomies performed. We present the case of a 44-year-old woman admitted to the emergency department for abdominal pain in the right iliac fossa with suspicion of acute appendicitis. Laboratory tests showed leukocytosis with neutrophilia at 71%; an ultrasound image showed a complex mass in the right iliac fossa, and simple and contrasted tomography of the abdomen showed a sub and retrocecal collection. An exploratory laparotomy was performed, obtaining a tumor dependent on the middle and distal appendicular third. Primary resection was performed, and the specimen was sent to pathology. The histopathological study reported a mucinous neoplasm of the cecal appendix; the immunohistochemistry study showed negative CKAE1/AE3, negative CK20, negative CK7, and negative MUC 5.

RESUMEN

El tumor mucinoso es un tumor con muy baja incidencia, la cual se reporta en el 0.2% de apendicectomías realizadas. Se presenta caso de una mujer de 44 años que ingresó a urgencias por dolor abdominal en fosa iliaca derecha con sospecha de apendicitis aguda. Se reportaron laboratorios con leucocitosis con neutrofilia al 71%; ultrasonido que evidenció una masa compleja en fosa iliaca derecha, y una tomografía simple y contrastada de abdomen que mostró una colección sub y retrocecal. Se realiza laparotomía exploradora obteniendo tumor dependiente de tercio medio y distal apendicular. Se realiza resección primaria y se envía pieza a patología. El estudio histopatológico reporta neoplasia mucinosa de apéndice cecal; la inmunohistoquímica señala CKAE1/AE3 negativo, CK20 negativo, CK7 negativo, MUC 5 negativo.

INTRODUCTION

The mucinous tumor of the appendix was first described by Rokitansky in 1842. The literature reports an incidence of 0.2-0.4% of all appendectomies performed,[1] and a frequency of less than 0.5% of all gastrointestinal tumors.[2] Considering its low incidence, incidental findings during surgery are the most common form of its appearance. It predominates 4:1 in women and has a higher frequency above 50 years of age.[1]

The form of presentation can be variable. In most cases, the most common symptom is abdominal pain in the right iliac fossa, which can be confused with acute appendicitis, this being the most common differential diagnosis.[3]

The diagnosis is usually made during surgery or incidentally in the analysis of histologic specimens. Mucinous tumors represent about 8% of appendiceal neoplasms and can cause cystic dilatation of the appendix due to the accumulation of gelatinous material.[4]

According to the Pai and Longacre classification, mucinous tumors of the appendix are divided into mucinous cystadenoma, mucinous neoplasm of uncertain malignant potential, mucinous neoplasm of low malignant potential, and mucinous adenocarcinoma. Mucinous ascites, known as pseudomyxoma peritonei, is found in more than 50% of these patients, and its presence indicates a more advanced stage and worse prognosis. It can present as low-grade (diffuse peritoneal

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adenomucinosis) or high-grade (diffuse peritoneal carcinomatosis).[5]

Treatment of this entity is based on stage and histology. Low-grade tumors can be managed surgically with resection of the primary tumor at an early stage, or, in some cases, radical right hemicolectomy may be considered depending on the involvement.[6]

The main objective of this study is to present the clinical presentation of the mucinous tumor of the appendix through the report of a clinical case study in our hospital environment and a brief review of the literature on this pathological entity.

PRESENTATION OF THE CASE

This is the case of a 44-year-old female patient with a history of type 2 diabetes of 15 years of evolution in treatment with metformin and glibenclamide, and systemic arterial hypertension of 20 years of evolution in treatment with atenolol and amlodipine. She had a laparoscopic cholecystectomy on 10/01/2022, which subsequently required a Roux-en-Y biliodigestive bypass secondary to anatomical disruption of the bile duct of Bismuth 3 on 13/03/22.

Current condition

She started with abdominal pain of 36 hours of evolution after ingestion of copious food, predominantly in the right iliac fossa, without irradiation, accompanied by nausea and oral intolerance. She was managed with antispasmodic by private means, without improvement of symptomatology.

On physical examination, she had vital signs with a blood pressure of 130/70 mmHg, respiratory rate of 20 breaths per minute, heart rate of 85 beats per minute, and temperature of 37º Celsius. She was conscious, alert, reactive, Glasgow 15 points, regular head, short neck without adenomegaly, symmetrical thorax with adequate air inlet and outlet, lung fields without rales, rhythmic heart sounds, good tone without added noises, abdomen globose at the expense of adipose panniculus, subcostal scar in the right hypochondrium and epigastrium, peristalsis present, generalized abdominal pain on deep palpation, predominantly in the right iliac fossa, positive McBurney maneuver, positive Dunphy, negative Lanz sign, negative Thalus percussion, negative obturator, deferred genitalia, eutrophic extremities, intact.

Pre operative

Hospital admission labs (02/11/22): hemoglobin 12.9 g/dL, hematocrit 39%, leukocytes 13.2 × 10^9/L, neutrophils 71%, platelets 275 × 10^9/L, glucose 117 mg/dL, BUN 7.4 mg/dL, urea 15.8 mg/dL, creatinine 0.47 mg/dL, total protein 8 g/dL, albumin 3.8 g/dL, total bilirubin 0.8 mg/dL, AST 21 IU/L, ALT 47 IU/L, LDH 135 IU/L, sodium 137 mmol/dL, potassium 3.62 mmol/dL, chloride 99 mmol/dL, amylase 90 U/L, lipase 21 U/L, C-reactive protein 10 mg/dL.

Imaging studies were performed to complement the diagnostic approach. They reported the following: an abdominal USG on 02/11/22 showed a complex mass in the right iliac fossa, ovoid morphology with defined borders, of heterogeneous aspect predominantly hypoechoic with poorly defined internal areas of lower echogenicity and echogenic focal areas, avascular on color Doppler, with dimensions of 58 × 38 × 48 mm; complicated appendicitis vs. neoplastic process not ruled out was concluded. A hemorrhagic cyst in the left ovary O-RADS 2 (risk of malignancy less than 1%), and a simple cyst in the right ovary were also seen.

A simple and contrasted abdominopelvic CT scan on 03/11/22 showed a sub and retrocecal collection of 50 cm3 with a peripheral inflammatory process, suggesting a complicated appendicular process *(Figures 1 and 2)*.

Trans operative

She was admitted to the operating room, where an exploratory laparotomy was performed (04/10/2022). An infraumbilical midline incision was made; the abdominal cavity was accessed, and peritonitis was observed in the right iliac fossa. A retrocecal appendix was located, with a plastron dependent on the appendicular tumor in the middle and distal thirds measuring 4 cm in diameter with an appendicular base respected. A simple

Figure 1: *Simple contrasted CT scan of the abdomen, sagittal view. Right lower quadrant with the presence of inflammatory changes of the perirectal fat.*

appendectomy with U-stitch and invagination technique was performed. A Penrose-type drainage was placed, directing it towards the right iliac fossa. A surgical specimen was taken and sent to pathology *(Figure 3)*.

Postoperative

The patient had an adequate clinical evolution post-surgery. She was kept under surveillance for four days in the hospital, presenting serous Penrose discharge of approximately 5 mL every 24 hours; she was managed with antibiotic therapy based on ceftriaxone and metronidazole for three days and was subsequently discharged for further study and to obtain the pathology report from the outpatient department.

The pathology report on 06/12/22 was of a mucinous neoplasm of the ruptured cecal appendix and acute intense inflammation secondary pseudomyxoma peritoneum. The report recommended an immunohistochemical study to confirm the diagnosis and rule out malignancy *(Figure 4)*.

Immunohistochemistry report 12/13/22: CKAE1/AE3 negative, CK20 negative, CK7 negative, MUC5 negative. The definitive diagnosis was a mucinous tumor with acute appendicitis and adenomucinosis, probable mucinous cystadenoma.

Tumor markers 19/12/22 indicated a 1.0 ng/mL carcinoembryonic antigen and a CA-125 antigen of 6.75 U/mL.

The Oncologic Surgery Service evaluated the patient in the postoperative period, using a complete protocol of post-surgical studies. It was determined that, since it was a low-grade mucinous neoplasm, it only required outpatient follow-up with any other type of treatment.

She was evaluated at the general surgery outpatient clinic two months after surgery; she was doing well and had no gastrointestinal symptoms.

DISCUSSION

The term mucocele was created in 1842 by Rokitansky; however, it is currently only used for macroscopic or imaging description and as a clinical term, never as a definitive diagnosis.[5]

As previously mentioned, the presentation of mucinous tumors of the appendix is rare and non-specific. It varies from totally asymptomatic forms to abdominal pain in the right iliac fossa, like acute appendicitis, palpable mass, digestive hemorrhage, or urological symptoms as in the case presented. In our patient, the clinical presentation began with abdominal

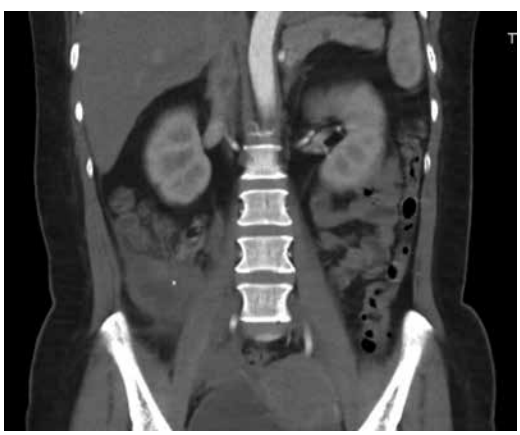

Figure 2: *Simple CT scan of the abdomen, coronal section. The right iliac fossa has a circumscribed image of calcific density.*

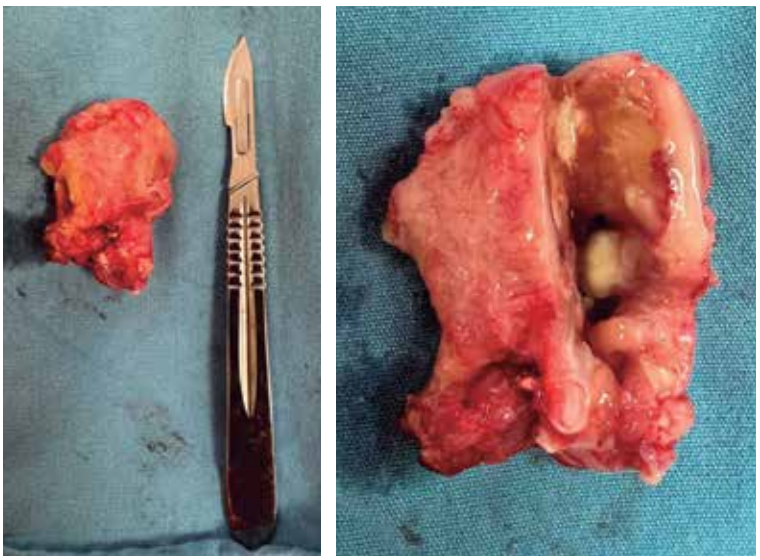

Figure 3: *Cecal appendix tumor. Surgical specimen.*

pain in the right iliac fossa, which simulated a picture of acute appendicitis, so the main objective of surgical treatment was to perform an appendectomy. However, during the trans surgical period, there were findings suggestive of a neoplasm, which was later confirmed by pathology as a mucinous tumor of the appendix.

Tumors of the appendix are infrequent clinical conditions, and the non-specificity of the symptoms means that in most cases, they are diagnosed as a trans surgical finding or by the postoperative histopathological report.[5,6]

The literature reports a female predominance and a peak presentation between the fifth and sixth decade of life on average, as in our patient. There is no established test for diagnosis. However, in ultrasonography studies, a hypoechoic lesion can be observed, while in tomography, the images are hypodense and homogeneous, like «onion layers», sometimes with cystic areas inside or with calcified walls many times adjacent to the cecum.[7] If the appendix measures ≥ 15 mm in its transverse diameter, a mucocele should be suspected with a sensitivity of 83% and specificity of 92%.[8]

The imaging test of choice is computed tomography, which is diagnostic in less than 50% of the cases.[1] Although, in the first instance, the diagnostic suspicion in our patient was acute appendicitis and not a mucinous tumor of the appendix, computed tomography -which is considered the best imaging study in both pathologic entities- was an essential diagnostic complement in the approach; however, it was not conclusive. The irregularity in the appendiceal wall and increased soft tissue thickness may predict tumor malignancy.[8]

As a complement to the patient's evaluation, the tumor tissue was subjected to CK20 and CK7 immunohistochemistry. CK20 is a cytokeratin and a marker of intestinal tumors, and CK7 is a cytokeratin and a marker of gynecologic malignancies,[9] reported as an adjuvant in diagnosing this entity. The immunohistochemistry result was negative.

Tumor markers such as CEA, CA 19-9, and CA-125 also have diagnostic and prognostic value for mucinous neoplasms and can be used in postoperative follow-up.[10] The patient was evaluated with CEA and CA-125, which were found to be in the normal range. Considering the results of the immunohistochemistry and

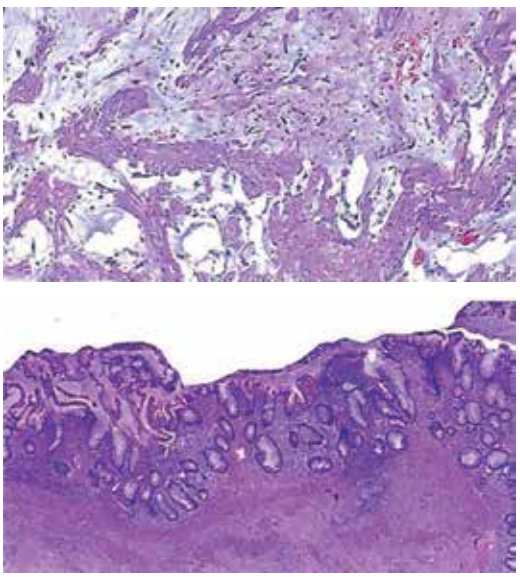

Figure 4: *Histological sections of smooth muscle tissue with abundant mucus lakes are observed. Some tissue fragments at the mucosal level show focally serrated deformed crypts lined with the simple cylindrical epithelium of the enterocyte type alternating with goblet cells. The lamina propria exhibits an organized lymphoid infiltrate.*

tumor marker tests, the case was considered not conclusive for neoplasia with any degree of malignancy. Therefore, the patient was managed with follow-up, and there was no need to perform another surgical intervention.

The treatment of choice is surgical and can range from appendectomy with free margins for small lesions without rupture and neoplastic aspect to radical right hemicolectomy in cases at risk of presenting a cystadenocarcinoma for large or perforated lesions. If the finding is incidental during surgery, conversion from laparoscopy to laparotomy is recommended because of the risk of mucin dissemination and the need to explore areas such as the colon or ovaries.[8]

CONCLUSIONS

Mucinous tumors of the appendix are a heterogeneous group of neoplasms with low incidence and insidious clinical presentation, making them a diagnostic challenge for the surgeon. The diagnostic approach with laboratory and imaging studies is of utmost importance in these patients; computed tomography is the study of choice. Since it is generally considered a trans operative diagnosis, surgery in the first instance is fundamental. It can be definitive for patients, so the surgeon must be aware of this entity and make the right decisions when faced with it so that he/she can choose the best surgical conduct and avoid complications.

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Phoenician contributions to surgery and medicine

Aportaciones fenicias a la cirugía y la medicina

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Keywords:
surgery, medicine, phoenicians, history, trade.

Palabras clave:
cirugía, medicina, fenicios, historia, comercio.

ABSTRACT

We present an analysis of the essential elements of Phoenician medicine and surgery, a culture that covered all points of the Mediterranean coasts between 2000 and 200 B.C., so called because of their red fabrics made from crustaceans (from the Egyptian *kena'ani* and Greek *phoinix*). The studies regarding their medicine began in the temples of Sidon based on the medical-God Eshmun (origin of Asclepiades), where they cured and taught medicine that healed, driving away evil spirits, according to the mechanics of health-disease of these people (the struggle between Baal, another medical God, and Mot, God of death). The oldest writing of their medicine was the Ebers papyrus, written by an oculist from Babylos (Phoenicia). In surgery, bone callus repairs from falls and sharp injuries have been documented, as well as scurvy injuries, typical of maritime peoples.

RESUMEN

Presentamos un análisis de los elementos más importantes de la medicina y cirugía fenicia que fue una cultura que abarcó todos los puntos de las costas mediterráneas entre los años 2000 a 200 a. C., llamados así por su confección de telas rojas a partir de crustáceos (del griego phoinix). Los estudios respecto a su medicina iniciaron en los templos de Sidón con base en el Dios-médico Eshmún (origen de Asclepíades) donde se curaba y enseñaba medicina que sanaba, alejando a los malos espíritus, según era la mecánica de salud-enfermedad de este pueblo (la lucha entre Baal, otro dios médico, y Mot dios de la muerte). Al parecer el escrito más antiguo de su medicina fue el papiro de Ebers que fue escrito por un oculista de Babylos (Fenicia). En la cirugía se han documentado reparaciones de callo óseo de caídas y lesiones por arma punzocortante, así como lesiones por escorbuto, propias de los pueblos marítimos.

INTRODUCTION

The Phoenician culture, from the Egyptian *kena'ani* and the Greek *phoinix* (red or purple), has Neolithic antecedents in Asia Minor since 3500 B.C. from the people of Canaan since they produced a product extracted from crustaceans that gave a purple color to fabrics.[1,2] They spread rapidly from the coast of Sidon, Ugarit, Byblos, and Tyre, arriving around 1000 B.C. to Utica (Gulf of Tunisia) or Cadiz around 1100 B.C. date of the probable foundation of the temple of Melkart.[1] They reached their splendor between the X to VII B.C.,[2]. They worked in prosperity until the Romans conquered them around 300 to 150 A.D.[1]. Long before the Romans, their power developed in Asia Minor towards the Mediterranean, constituting a people located in the current area of Lebanon, until they managed to extend along the old *Mare Nostrum* of the Romans. One of those points reached was Carthage, founded by sailors from Tyre at the end of the 9th century B.C., in northern Tunisia. C., in the north of Tunisia, naming it Qart Hadasht, which extended to the south of Spain.[3]

Interestingly, recent studies regarding genetics can lead us to the development of settlements and their change to different regions of the Mediterranean through gene patterns.[4,5] These great people, who would be the predecessors of the Lebanese people,[6] were governed by a system of authorities appointed

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among themselves. Regarding medicine, we find that, within their culture, there was data in the Library of Ugarit with treatises describing diseases since 1400 B.C.

An interesting aspect is that Phoenician medicine went hand in hand with the maritime and commercial expansion of the Mediterranean. Therefore, the flow of knowledge of our profession was linked to this development, being one of the most relevant in expanding the Phoenician alphabet from the cities of Carthage to Byblos and from there to the Greek cities, contributing to the dissemination of medical and surgical knowledge of the time.[7]

MEDICAL ASPECTS

The medical tradition began around the 6th century B.C. in Sidon (40 km north of Tyre), where a temple dedicated to Eshmun, the medical god and equivalent to the Greek Asclepius, was found.[7] These studies were carried out by Theodore Makridi Bey (1872-1940), who collected the first elements, probably because he was the son of a Turkish military doctor.[8] According to the ancestral culture, Eshmun was a hunter of Berytos (Beirut) who fell in love with the goddess Astarte, but the young man died mutilated; the goddess used the "vital heat", bringing him back to life with attributes of healer and god, which was documented between 754 to 675 B.C.[9] In the Phoenician tradition, Eshmún carries a scepter (staff) in her right hand, where a snake is entangled, and a scorpion in her left shoulder *(Figure 1)*. The signs of the serpent and the scorpion *(Figure 2)* are beneficent as they signify the renewal, the other the healing medicine, and both health, fertility, and fecundity. These symbols passed from the Phoenicians to the Greeks and Romans about a century later, when the Phoenicians traveled the Mediterranean and brought their culture to Greece and Rome. Today, the symbols are used in medical schools and medical practice, with the oldest written reference dating back at least 3,300 years.

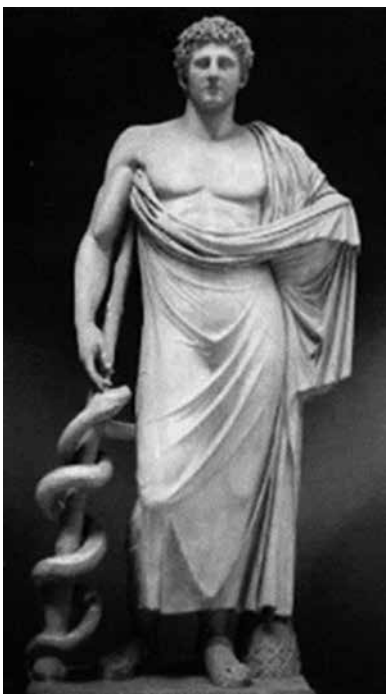

Figure 1: *Sadrafa or Eshmún among the Phoenicians, Asclepius among the Greeks, and Aesculapius for the Romans. Throughout history, the concepts and images of Sadrafa, Eshmún, Asclepius, and Aesculapius are equivalent.*

Figure 2: *These triangles symbolize Sadrafa (Eshmun), serpent, and scorpion. Starcky (1949) "The physician is heir to law, justice, and wisdom".*

Hospitals and medical schools in Canaan (Phoenicia) were known as Eshmun temples. Here, doctors attended to and received the sick and could spend the night to be treated. These temples were built next to springs and wooded areas for hygienic purposes, and these hospitals, in turn, were also medical schools.

Within the dynamics of maritime trade of the Phoenicians, there is evidence, now both genetic and anthropological, of their passage in places like ancient Carthage or even the beaches of Portugal; this extensive network of commercial ports along the southern Mediterranean, being the island of Malta a

strategic point since the eighth century B.C. In this vast terrain, medicine was always necessary. The evidence is scarce, but it is known that the same Ebers papyrus was written by an oculist doctor of Babylos in Phoenicia, being very different from the origin of its tradition since the disease was determined by malevolent spirits that impregnate the universe and intervene in the human processes. Therefore, medicine was coupled with religion. Baal was the god of medicine; in an eternal struggle against Mot, the god of death, life is a natural balance between all its forces.[10]

Thanks to elements found in Malta or in the area where Carthage was located, we know that nursing activities were carried out by a male urinal and a kind of bottle with an antiquity dated around 150 B.C.[11]

The first medical writing of this culture is that of Sanken Yaton in 1300 B.C., with references found in Byblos, Carthage, and Palmyra; he was the most outstanding physician of this culture, describing remedies against diseases and animal poisons and surgical means of drainage.[12,13]

SURGICAL ASPECTS

Notably, the aspects of ophthalmology are those reported in other cultures but retained part of their magical-religious traditions, at least until 200 B.C., in which they combined natural reason with Roman cultures.[14] On the other hand, there was a knowledge of the general anatomy since there are plates with drawings of intestines and the liver found in Carthage. This image that represents a human figure with an apparent snake head and some elements of abdominal viscera perhaps represents a ritual offering,[15] but in a very different context to that developed in Babylon where the gods were asked to use a viscera in clay to avoid such evil.[16] Martin-Ruiz[15] in his memory of entities of Ibiza, regarding the era of the Phoenicians, stated that there are significant antecedents of repair of fractures based on the bones, being the suggestive aspect that they were caused by trauma with ages between 20 to 30 years; of course, some with evident mechanism of arrows, it calls the attention the pieces of long bones of the necropolis of Panormo that came to heal, by the strong callosities, describes the case found by Dr. Di Salvo in 2004 of a long bone of the necropolis of Panormo that came to heal, by the strong callosities, describes the case found by Dr. Di Salvo in 2004 of a bone pierced by an arrow and where the space of this injury remained in the bone.[17,18]

It should be noted that, in the Phoenician villages of Ibiza, many cases have been found of patients between 20 and 30 years of age with loss of teeth, most probably due to scurvy, which was frequent in the villages dedicated to maritime activities, due to the long periods of travel by ship. However, dental prostheses were documented, showing surgical manipulations to preserve the teeth and that they knew the consequences of this loss of teeth.[19]

CONCLUSIONS

Like other ancient peoples, the Phoenicians were before 200 B.C., a people who combined medical and religious concepts. Still, their gods and the origin of diseases were very different from those of the Greeks and Egyptians, although they were combined in various parts of the Mediterranean. Naturally, diseases such as scurvy and falling teeth were part of their entities to be solved by dental surgical means, followed by deficiency diseases and then problems arising from trauma, either by the regions of difficult access or their war activities, by land or sea, which conditioned management of trauma fractures of pelvic and thoracic limbs. A very little appreciated aspect is that thanks to the trading system of the Phoenicians, the different cultures were able to expand from Spain to Egypt, from Sicily in Italy to Crete or Asia Minor. Simply put, the city of Byblos was the center of culture, where this diffusion was done, and, therefore, the medical culture of the time reached the farthest corners of the known earth. We make this compilation to pay tribute to the ancient Phoenicians and the Lebanese people today who take up the medical surgical practice from their ancestors in the Mediterranean.

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