

## Revista Mexicana de Cirugía Endoscópica

Volumen 5  
Volume

Número 4  
Number

Octubre-Diciembre 2004  
October-December

*Artículo:*

### Laparoscopic Meckel's diverticulum resection in adults: Experience at the Texas Endosurgery Institute

Derechos reservados, Copyright © 2004:  
Asociación Mexicana de Cirugía Endoscópica, AC

Otras secciones de  
este sitio:

-  [Índice de este número](#)
-  [Más revistas](#)
-  [Búsqueda](#)

*Others sections in  
this web site:*

-  [Contents of this number](#)
-  [More journals](#)
-  [Search](#)



## Laparoscopic Meckel's diverticulum resection in adults: Experience at the Texas Endosurgery Institute

Morris E Franklin Jr. MD FACS,\* Adolfo Leyva-Alvizo MD,\*\* Jeffrey L Glass MD FACS,\* Jorge M Treviño MD,\* Paul P Arellano MD,\* Saul A Madrigal S MD\*\*

### Abstract

Reports have demonstrated the feasibility and safety of laparoscopic procedures in large series of children and adults as well, mostly in symptomatic patients. A total of six patients were approached laparoscopically between 1993 and 2004, two with symptoms attributable to the diverticulum itself, and four with incidental diverticula during procedures for other reasons. The sex distribution was three males and three females, with median age 53 years (between 19-86 years). In all of the patients the resection was only of the diverticulum, not small bowel resections. The mean hospital stay was 6 days, with a range of 2-15 days. No malignancies were reported. All of the patients had follow up, and had no perioperative complications related to the resection, especially recurrent bleeding in the symptomatic cases. Our results show only adult patients, with mean age above 50 years, something different from the rest of the series revised. No complications were found in our series, this shows that laparoscopy is safe and efficient in the diagnosis and treatment of Meckel's diverticulum, and that treatment in adult asymptomatic patients can be equally safe.

**Key words:** Diverticulum, Meckel, laparoscopic, Texas, endosurgery, institute.

### BACKGROUND

Meckel's diverticulum represents a true diverticulum of the ileum containing all 3 layers of the bowel wall. It is the most frequent congenital anomaly of the small bowel, occurring in approximately 2% of the general population. Its first description was made by Hildanus in 1598<sup>1</sup> and described in detail by Meckel in 1809.<sup>2</sup> It is located on the antimesenteric border of the ileum usually two feet proximal to the ileocecal valve, and results from an incomplete closure of the omphalomesenteric duct. The majority are incidentally discovered during laparotomy, autopsy or imaging studies.<sup>3</sup> Symptomatically the abnormalities present

### Resumen

Varios reportes han demostrado la seguridad de este procedimiento en niños y adultos, la mayoría de ellos sintomáticos. Se realizó el abordaje laparoscópico en seis pacientes entre 1993 y 2004, dos de ellos con síntomas atribuibles al divertículo per se, y cuatro con hallazgo incidental del divertículo durante otros procedimientos laparoscópicos. La distribución por sexo fue de tres hombres y tres mujeres, con una edad promedio de 53 años (19-86). En todos los pacientes la resección fue sólo del divertículo, no resecciones de intestino delgado. Para esto se utilizó un disparo de grapadora de 60 mm. El promedio de estancia hospitalaria fue de 6 días (2-15), debido a la complejidad de los procedimientos realizados en algunos pacientes (gastrectomía, resección intestinal). No se reportaron hallazgos de malignidad. Todos los pacientes tuvieron seguimiento, y no se reportaron complicaciones posoperatorias. Nuestros resultados muestran sólo pacientes adultos con una edad media arriba de los 50 años, algo diferente a lo reportado en otras series. Al no haber complicaciones relacionadas se demuestra la seguridad del procedimiento en pacientes sintomáticos y asintomáticos.

**Palabras clave:** Divertículo, Meckel, laparoscópico, Texas, endocirugía, instituto.

as gastrointestinal bleeding, intestinal obstruction and diverticulitis. GI bleeding is the most frequent complication in children, and diverticulitis is the most common presentation in adults. Hemorrhage is usually due to erosion of adjacent ileal mucosa by acid produced by the ectopic gastric mucosa. Intestinal obstruction is most often due to volvulus or intussusception about the Meckel's diverticulum. The rare herniation of the diverticulum in the inguinal canal is called a hernia of Littre. Rarely, benign and malignant tumors may both occur within a Meckel's diverticulum (adenocarcinoma, carcinoids and polyps).

Indications for treatment include all symptomatic conditions, and according to recent studies,<sup>4,5</sup> treatment in asymptomatic patients may be safer than originally reported.<sup>6</sup> Traditional management varies according to the manifestations of the diverticulum. For non bleeding diverticula, resection of the diverticula alone can be accomplished either with hand-

\* Texas Endosurgery Institute, San Antonio, TX, USA.

\*\* Hospital San José-Tec de Monterrey, Monterrey, NL, Méx.

sewn or stapled techniques. For bleeding diverticula, segmental intestinal resection is sometimes required because of profuse bleeding of the ileum adjacent to the diverticulum; although controversy exists regarding this and many resect the diverticulum alone, as it is the original cause of the bleeding. Reports have demonstrated the feasibility and safety of laparoscopic procedures in large series of children<sup>7</sup> and adults as well,<sup>8,9</sup> mostly in symptomatic patients. Others<sup>10</sup> found that adverse outcomes after incidental diverticulectomy were seen in 1% to 9% of patients, and recommend that symptomless Meckel's diverticulum should be left in place. The Mayo Clinic series<sup>11</sup> accurately approaches the controversy of the prophylactic removal of incidentally discovered Meckel's diverticulum. They conclude that Meckel's diverticula discovered incidentally at operation should be removed for most patients, regardless of age. The risk of complications of a Meckel's diverticulum has not been found to decrease with age so the benefits of incidental diverticulectomy outweighed its morbidity and mortality. With this, aided by the minimally invasive procedures, we decided to resect the diverticula found during surgery for other reasons.

The purpose of this article is to show our experience in the laparoscopic management of Meckel's diverticula in the adult population at the Texas Endosurgery Institute, and outline the feasibility of this procedure in symptomatic as well as incidental cases.

## MATERIAL AND METHODS

A total of six patients were approached laparoscopically between 1993 and 2004, two with symptoms attributable to the diverticulum itself, and four with incidental diverticula during procedures for other reasons. The sex distribution was three males and three females, with median age 53 years (between 19-86 years).

The two patients with a symptomatic Meckel's diverticulum presented with acute gastrointestinal bleeding.

The patients with incidental resection were operated for intestinal obstruction by Spigelian hernia (mesh repair), intestinal obstruction by adhesions (adhesiolysis and small

bowel resection), acute appendicitis (laparoscopic appendectomy) and gastric cancer (subtotal gastrectomy). In this last group of patients, the diverticulum was not involved at all in the disease processes.

## RESULTS

In all of the patients the resection was only of the diverticulum, not small bowel resections, and was performed with Endo GIA<sup>®</sup> (US Surgical, Norwalk, CT). Only one load of 60 mm staples was needed for the base of the diverticulum. In the last of the patients, the line of resection was closed with a 60 mm cartridge reinforced with Seamguard<sup>®</sup> (W.L. GORE & Assoc, Flagstaff, AZ) to prevent bleeding and leakage.<sup>12</sup> In the two symptomatic patients, appendectomy was performed profilactically using endoloops for the base (*Table 1*).

The estimated blood loss was in the range of 10-25 cc, excepting for the patient with the gastrectomy, in which the blood loss was estimated in 300 cc. The mean hospital stay was 6 days, with a range of 2-15 days. The reason for this was the complexity in two of the procedures (strangulated small bowel resection and gastrectomy). The final pathologic report found abnormal gastric mucosa in one patient, acute inflammation in the other and normal intestinal mucosa in the remaining four patients. No malignancies were reported. All of the patients had follow up, and had no perioperative complications related to the resection, especially recurrent bleeding in the symptomatic cases.

## DISCUSSION

Previous publications have addressed the laparoscopic management of Meckel's diverticulum, either for symptomatic or asymptomatic causes. The largest laparoscopic series describe the approach mostly in children, and complications vary according to studies. Largest series have been published in adult population as well with varied results. Our results show only adult patients, with mean age above 50 years, something different from the rest of the series revised. No complications were found in our series, in either

**Table 1.** Procedures realized according to diagnosis.

Patient	Symptoms	Diagnosis	Procedure
1	GI bleeding	Meckel's diverticulitis	Diverticulectomy + Appendectomy
2	GI bleeding	Meckel's diverticulitis w/gastric mucosa	Diverticulectomy (Seamguard <sup>®</sup> ) + Appendectomy
3	Intestinal obstruction	Spigelian hernia	Hernia repair w/mesh + diverticulectomy
4	Intestinal obstruction	Postoperative adhesions	SB resection + diverticulectomy
5	Gastric outlet obstruction	Gastric cancer	Subtotal gastrectomy + diverticulectomy
6	Acute abdomen	Acute appendicitis	Appendectomy + diverticulectomy

group of patients, emergent or incidental. All our cases were accomplished by resection of the diverticulum itself, sparing a small bowel resection. The hospital stay was short excepting for one case, and the follow up showed no fur-

ther bleeding in symptomatic cases. This shows that laparoscopy is safe and efficient in the diagnosis and treatment of Meckel's diverticulum, and that treatment in adult asymptomatic patients can be equally safe.

## REFERENCES

1. Arnold JF, Pellicane JV. Meckel's Diverticulum: A ten-years experience. *Am Surg* 1997; 63: 354-5.
2. Meckel JF. Über die divertikel am darmkanal. *Arch die Physiologie* 1809; 9: 421-53.
3. Yahchouchy E, Marano A, Etienne J, Fingerhut A. Meckel's diverticulum. *J Am Coll Surg* 2001; 192: 658-62.
4. Cullen JJ, Kelly KA, Moir CR et al. Surgical management of Meckel's diverticulum: An epidemiologic, population-based study. *Ann Surg* 1994; 220: 564-569.
5. Pintero A, Martinez-Barba E, Canteras M et al. Surgical management and complications of Meckel's diverticulum in 90 patients. *Eur J Surg* 2002; 168: 8-12.
6. Groebli Y, Bertin D, Morel P. Meckel's diverticulum in adults: Retrospective analysis of 119 cases and historical review. *Eur J Surg* 2001; 167: 518-524.
7. Dronov AF, Poddubnyi IV, Kotlobovskii VI, Al'-Mashat NA, Iarustovskii PM. Video-laparoscopic surgeries in Meckel's diverticulum in children. *Khirurgiia* 2002; 10: 39-42.
8. Tarcoveanu E, Niculescu D, Georgescu S, Neacșu CN, Dimofte G, Moldovanu R, Epure O. Meckel's diverticulum in laparoscopic era. *Chirurgia* 2004; 99: 227-32.
9. Ferranti F, Mondini O, Valle P, Castagnoli P. Meckel's diverticulum: Ten years experience. *G Chir* 1999; 20: 107-12.
10. Leijonmarck CE, Bonman-Sandelin K, Friseil J, Rä L. Meckel's diverticulum in the adult. *Br J Surg* 1986; 73: 146-9.
11. Cullen JJ, Kelly KA, Moir CR et al. Surgical management of Meckel's diverticulum. An epidemiologic, population-based study. *Ann Surg* 1994; 220: 564-9.
12. Franklin ME, Berghoff KE, Arellano PP, Treviño JM, Abrego-Medina D. Safety and efficacy of the use of bioabsorbable Seamguard in colorectal surgery at the Texas Endosurgery Institute. *Surg Laparosc Endosc Percutan Tech* 2005; 15: 9-13.

### Correspondence:

**Morris E. Franklin Jr. MD FACS.**

Texas Endosurgery Institute

4242 East Southcross Boulevard, Suite 1

San Antonio, Texas. 78222

Phone: (210) 333 7510

Fax: (210) 333 1912

Email: [texasendosurgery@texasendosurgery.com](mailto:texasendosurgery@texasendosurgery.com)