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Laparoscopic Resection of Meckel's Diverticulum: Report of Two Cases

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Abstract Symptoms of Meckel's diverticulum (MD) are present in only 4% of all cases and are often aspecific. The diagnostic modalities for the distal ileum are also often ineffective. We report herein two cases of MD's complications, intestinal obstruction and diverticulitis, which were managed laparoscopically. In both cases laparoscopy allowed the physician not only to make an accurate diagnosis but, at the same time, to perform a tangential resection of the MD.

Key words Meckel's diverticulum · Laparoscopy · Laparoscopic resection

Introduction

Meckel's diverticulum (MD) is the most common congenital abnormality of the gastrointestinal tract, occurring in 1%–3% of the population.[1,2] Although only 4% of MDs become symptomatic, surgeons should be aware of the fact that frequently the first pathological symptoms are already related to a serious complication. The complications associated with MD include inflammation, perforation, hemorrhage, intussusception, and intestinal obstruction. If a complicated MD is suspected based on specific symptoms (hemorrage, painful right iliac fossa), technetium-99m scanning is often sufficient to make a diagnosis preoperatively.[3,4] Since the symptoms are often aspecific or attributed to another pathology and the diagnostic tools of the distal ileum are frequently ineffective, the majority of cases of MD tend to be discovered incidentally during a surgical exploration of the abdomen. We report herein two cases in which laparoscopy not only allowed the physician to make an accurate diagnosis, but at the same, enabled him to perform the appropriate surgical treatment.

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Case Report

Case 1

A 31-year-old woman was admitted due to symptoms of abdominal pain, biliary vomit, and abdominal distension. A physical examination revealed a distended, painful abdomen, with no signs of peritoneal irritation. Laboratory values were all within the normal limits. Abdominal roentgenograms showed a small bowel obstruction (Fig. 1). A diagnostic laparoscopy was performed. The patient underwent nasogastric suction and Foley catheter drainage prior to surgery. The initial trocar placement in the umbilical region and pneumoperitoneum were established using a blunt-tip Hasson trocar. Two additional 5-mm ports were placed in the left and right lower abdomen under direct vision; an axial ileal volvulus around an MD attached to the umbilicus by a fibrous cord was discovered to be the cause of intestinal obstruction. After substituting the 5-mm left trocar with a 12-mm trocar, the fibrous band was divided by electrocautery and the ileum was carefully untwisted. After the introduction of a 35-mm endoscopic linear cutter (1 Endopath, Ethicon Endo-Surgery, Somerville, NJ, USA) through the 12-mm trocar, the MD was tangentially resected (Fig. 2) and delivered extraperitoneally through the same port. An inspection of the mucosa did not show any evidence of ectopic tissue, and the ensuing histopathological examination of the MD showed a normal small bowel mucosa with mild fibrosis of the serosa (Fig. 3). Nasogastric suction was continued for 48 h after surgery. The postoperative course was uneventful and the patient was discharged on postoperative day 4. The patient is presently doing well, 3 years after surgery.

Fig. 1. Abdominal plain roentgenogram of case 1

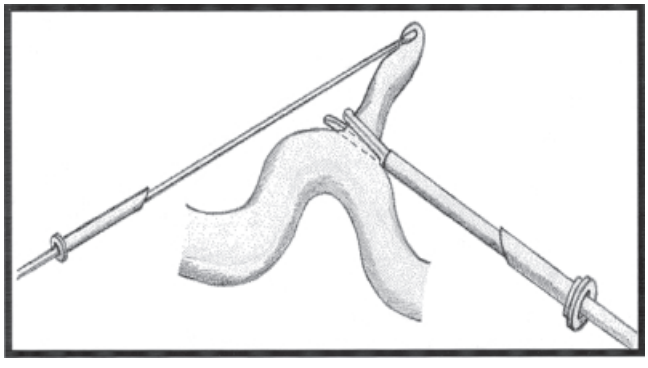

Fig. 2. Tangential resection of Meckel's diverticulum

Case 2

A 22-year-old woman was admitted with abdominal pain, fever, and vomiting. Laboratory tests showed only an elevated white blood cell count (16000/mm^3). Acute appendicitis, initially suspected based on the presence of a painful right hypogastrium, was not confirmed by ultrasound. A diagnostic laparoscopy was thus performed using the three port sites as described in case 1. The 30° laparoscope view showed a normal appendix, uterus, and adnexa. MD was detected with a thickened wall without any attachment to the umbilicus (Fig. 4).

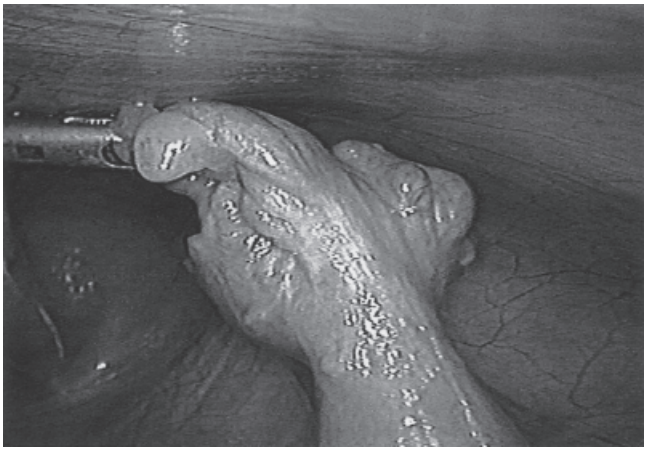

Fig. 3. Meckel's diverticulum (case 1) at laparoscopy

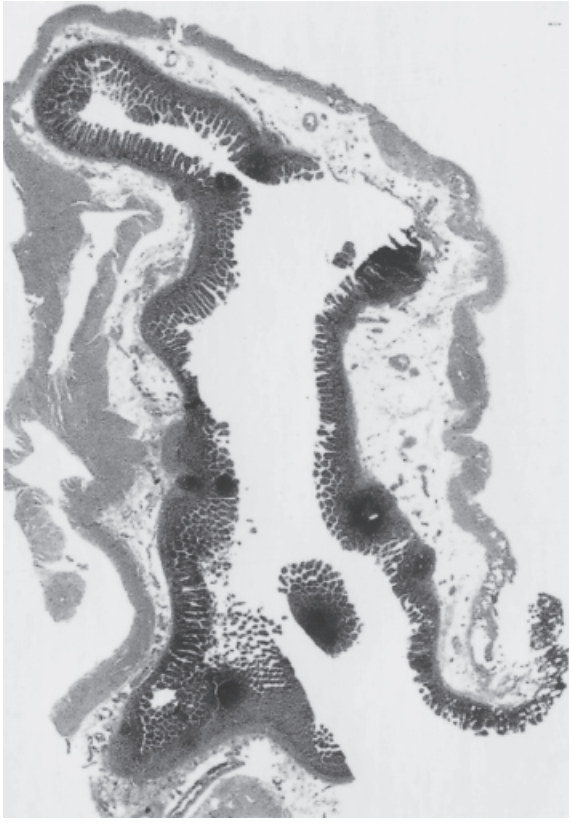

Fig. 4. Meckel's diverticulum (case 2) during a histological analysis

The same tangential resection (Fig. 2) of the diverticulum as that described in case 1 was performed. The MD specimen was placed in a retrieval bag and pulled out through the left 12-mm port site. An inspection of the mucosa did not reveal any evidence of ectopic tissue; a histopathological examination revealed acute diverticulitis of the MD without any ectopic mucosa in the lu-

men. After an uneventful course the patient was discharged on postoperative day 4. The patient is now doing well, 4 years after surgery.

Discussion

Two cases of undiagnosed and unsuspected MDs discovered and treated by laparoscopy are reported. Both the safety and efficacy of a diagnostic laparoscopy for the simultaneous evaluation and treatment of emergency patients have been proven.[5] Even in cases of acute small bowel obstruction, a laparoscopy has proven to be a safe and effective diagnostic procedure.[6] Obviously, diagnostic laparoscopy cannot be used in all abdominal emergencies, and its usefulness is closely linked to its therapeutic interest.[5] According to the criteria of Vons[5] we perform a diagnostic laparoscopy only if the other diagnostic tools fail and it seems possible that laparoscopy will simultaneously identify the lesion and also indicate its appropriate treatment. The complications associated with MD often fall into this category. Diagnosis is frequently difficult: over one third of the complications of MD are an aspecific intestinal obstruction,[7] and often an acute inflammation of MD has the same clinical presentation as acute appendicitis. In most cases reported in the literature, laparoscopy allowed the physician to establish the diagnosis and at the same time to perform the appropriate treatment. Considering that the laparoscopic approach is associated with a short hospitalization and rapid recovery,[8,9] as in the cases reported herein, the laparoscopic treatment of MD may become the treatment of choice for this disease. Nonetheless, controversy remains concerning the extent of the resection to be performed in symptomatic patients. A transverse stapler MD resection has been recommended as a safe procedure during open surgery.[10] Following the recent development of laparoscopic stapler devices, a laparoscopic tangential resection with a linear cutting and stapler device across the base of the diverticulum has become feasible.[8] However, some surgeons maintain that a transverse stapler resection involves the risk of performing an insufficient resection and thus leaves ectopic tissue,[9] which may later require a larger resection. The incidence of ectopic mucosa in symptomatic patients is typically much higher than in asymptomatic patients.[11] In our opinion, to perform the most appropriate procedure it is necessary to clearly distinguish which complication of MD exists before surgery. In the case of occlusion or inflammation, an inspection of the specimen performed by the surgeon is mandatory and should be sufficient to ensure the absence of ectopic tissue in the resection margin. This statement is corroborated by the uneventful outcome of the patients we observed. Only when an inspection of the specimen is doubtful should a formal segmental bowel resection be performed. On the other hand, in the case of MD complicated by bleeding or perforation, a segmental bowel resection should be performed as the initial procedure, since if any residual gastric mucosa is left behind it could result in a recurrence.[12] In these cases, the laparo-assisted technique recently proposed by Schmid et al.[9] was found to be a safe and effective method.

In conclusion, regardless of the need to make an extension of the intestinal resection, the occurrence of complications in relation to MD are an indication for a laparoscopic exploration, which allows surgeons to make an accurate diagnosis and also carry out immediate treatment.

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