MECKEL’S DIVERTICULUM - A RARE CAUSE OF INTESTINAL OBSTRUCTION IN ADULTS

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MECKEL’S DIVERTICULUM - A RARE CAUSE OF INTESTINAL OBSTRUCTION IN ADULTS (Abstract): Although many people have Meckel’s diverticulum, only some experience any symptoms, most under the age of 10. In adults it is usually asymptomatic but approximately 4% develop complications. Meckel’s diverticulum is usually diagnosed in the first years of life and after that the risk of the complications decreases with increasing age, with no predictive factors for the development of complications. We describe the case of a 34-year-old man admitted in the emergency department with diffuse abdominal pain, nausea, flatulence and lack of transit for feces and gas. The patient had been previously operated for peritonitis due to a perforated ulcer. Clinical examination and paraclinical investigations (abdominal radiography and ultrasound) suggested the diagnosis of intestinal obstruction, probably produced by adhesions due to previous abdominal intervention. The diverticulum was resected using a linear stapler and the patient recovered without any complications. Small bowel obstruction due to Meckel’s diverticulitis may be caused by entangled loop of small bowel around a fibrous cord, intussusception, volvulus, or incarceration within a hernia sac. The discovery of a Meckel’s diverticulum complication in a mid thirties patient represented an intra-operative surprise and is the peculiarity of the case. Keywords: MECKEL’S DIVERTICULUM, INTESTINAL OBSTRUCTION, COMPLICATION.

Meckel’s diverticulum (MD) is an outpouching of the distal ileum, due to persistence of the congenital vitello-intestinal duct, located at the anti-mesenteric border, usually within 45-60 cm of the ileocecal valve (1).

Considered the most common congenital malformation of the gastrointestinal tract (present in 2-4% of population), it was first described in a paper published in 1809 by the German anatomist, Johann Friedrich Meckel (1781-1833), who characterized it as a remnant of the omphalo-mesenteric duct. In the fetal life, it connects the yolk sac to the intestinal tract and usually it obliterates in the 5th to 7th week of life. If this process fails, the congenital anomalies develop, leading to the residual fibrous cords, umbilical sinus, omphalo-mesenteric fistula, entero-cyst and most commonly, Meckel’s diverticulum (2).

Meckel’s diverticulum is lined mainly by the typical ileal mucosa as in the adjacent small bowel. However, other ectopic
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tissue (most common gastric, duodenal, colonic, pancreatic, endometrial mucosa) may be found, usually near the tip (3, 4).

Although many people have Meckel’s diverticulum, only some experience any symptoms, most under the age of 10. In adults it is usually asymptomatic but approximately 4% develop complications such as obstruction, due to the intussusception or adhesive band (14-53%); ulceration (less than 4%); diverticulitis; and perforation (2, 5, 6).

Tumoral transformation (carcinoid tumor, stromal tumor, carcinoma, adenocarcinoma), intra-ductal papillary mucinous adenoma of pancreatic tissue and vesicodiverticular fistulae are rare complications.

CASE PRESENTATION

We describe the case of a 34-year-old man admitted in the emergency department with diffuse abdominal pain, nausea, flatulence and lack of transit for feces and gas. The patient had been previously operated for peritonitis due to a perforated ulcer. Clinical examination and paraclinical investigations (abdominal radiography and ultrasound) suggested the diagnosis of intestinal obstruction, probably produced by adhesions due to previous abdominal interventions.

Exploratory laparotomy was decided and performed under general anesthesia and moderate dilation of the small bowel was discovered. During arduous adhesiolysis, an intestinal volvulus caused by the Meckel diverticulum adhesions was unveiled. It had an unusual length of over 20 cm and was torsioned in pelvis through massive viscerovisceral and visceroparietal adhesions (fig.1).

Fig. 1. Meckel’s diverticulum after dissection and isolation

After cutting the adhesions and de-volvulation, the diverticulum was resected using a linear stapler, fired at its base of implantation (fig. 2, fig. 3).

Fig. 2. Diverticulum resection using a linear stapler

Fig. 3. Final aspect of mechanical suture line
A peritoneal lavage was performed with dextran solution and mesenteric novocaine injection. The viability check confirmed that the intestinal loop regained its color and peristalsis. The patient recovered without any complications.

**DISCUSSION**

Meckel’s diverticulum is usually diagnosed in the first years of life and after that the risk of the complications decreases with increasing age, with no predictive factors for the development of complications. Although the incidence of MD is equal in both sexes, complications are more frequent in men than in women, with a male-female ratio of about 3:1 (7, 8, 10).

Mackey (9) published a large retrospective study with a total of 402 patients with a diagnosed MD over a period of fifty years. Of all complications, 70.1% occurred in patients younger than 40 years of age. According to Lutké (8), most diverticular complications were seen in children younger than 2 years of age. Leijonmarck (11) found a lifetime risk of complications from MD of 3.7% at 16 years, 2% at 30 years and almost zero when older. The more recently published Mayo clinic experience with 1,476 patients of Park (10) found significantly more symptomatic MD in patients younger than 50 years of age.

Adults develop obstruction or, less frequently, symptoms of inflammation. Hemorrhage is less common and is usually the result of heterotopic gastric or pancreatic mucosa causing ulceration. Small bowel obstruction due to Meckel’s diverticulitis may be caused by entangled loop of small bowel around a fibrous cord, intussusception, volvulus, or incarceration within a hernia sac. Obstruction is usually demonstrable on plain films of the abdomen and the cause of the small bowel obstruction might be shown by CT. (5)

Due to the rarity of cases in adults, Meckel’s diverticulum is still misdiagnosed preoperatively. The surgeon should always consider this if a patient has abdominal pain and/or vomiting and physical examination and ultrasonography findings are not suggestive of appendicitis or air-fluid levels are found on abdominal X-ray. If no surgical pathology is found during laparotomy, it is advisable to carefully inspect the small intestine, particularly the last segment, where Meckel’s diverticulum is most commonly discovered.

**CONCLUSIONS**

The proper management of asymptomatic Meckel’s diverticulum is still controversial. It is difficult to predict which fortuitous diagnosed patients can become symptomatic. Morbidity rates after resection of incidentally found MD are much lower than those after resection of symptomatic MD. The risk for future complications of a non-resected MD must be weighed against the risk of complications after a resection in order to justify a prophylactic approach.

The discovery of a Meckel’s diverticulum complication in a mid thirties patient represented an intra-operative surprise and is the peculiarity of the case.

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REFERENCES


NANOFIBERS: AN IMPORTANT ALTERNATIVE IN THE TREATMENT OF WOUNDS CAUSED BY BURNS

Nanofibers and incorporation of antimicrobial compounds in these scaffolds are an important alternative way to control skin infections. The most common technique to prepare nanofibers is electrospinning. Nanofibers are produced from different polymers, treated in a specific manner to form threads with diameters from a few micrometers to nanometers. Also these structures can be used as drug delivery systems. The possibility to incorporate antimicrobial compounds to nanofibers, open a new perspective in biomedical engineering. Release of antimicrobial compounds, or other compounds that can accelerate the healing process, can be controlled by selecting polymers of specific composition. A localized delivery system is required to control the level and the rate of antimicrobial compounds delivered to the wounds. An example of drug delivery system is the incorporation of tannic acid on the surface of chitosan nanofibers, generated by electrospinning process. The antibacterial activity of chitosan is based on the damaging interaction of this polycation with the negatively charged surfaces of bacteria. In the same time, tannic acid inhibits bacterial growth for *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa*. With the involvement of scientific community, electrospinning became one of the most powerful tools for fabricating nanomaterials with a wide range of applications. (Xua F, Wenga B, Gilkersonb R et al. Development of tannic acid/chitosan/pullulan composite nanofibers from aqueous solution for potential applications as wound dressing. *Carbohydr. Polym.*, 2015; 115: 16-24).

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