Case Report

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Ruptured Meckel's Mesodiverticulum and Meckel's Diverticulum following Blunt Abdominal Trauma

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Key Words
Meckel's diverticulum · Hemoperitoneum · Traumatic rupture

Abstract
Objectives: To present a case of simultaneous rupture of Meckel's diverticulum and mesodiverticulum with abdominal pain following a blunt trauma to the abdomen, sustained during an automobile accident. ***Clinical Presentation:*** Following a head-on automobile collision a 36-year-old man was referred to the emergency room with abdominal pain, guarding and rigidity and was taken to the operating theater with a preoperative impression of peritonitis due to rupture of a hollow viscus. Upon abdominal exploration, ruptured Meckel's diverticulum (from the base) and ileum with active bleeding from mesodiverticulum was found. ***Intervention:*** The ileum was repaired in two layers: a segmental bowel resection including Meckel's diverticulum and the gastrointestinal tube anastomosed without any tension. The patient has a normal postoperative course. ***Conclusion:*** This case shows that a blunt abdominal trauma can tear the mesodiverticulum and rupture the Meckel's diverticular base simultaneously, resulting in hemoperitoneum and chemical peritonitis. Diagnosis and management of this type of injury are basically the same as those of acute surgical abdomen following trauma.

Introduction

In 1595, for the first time, Hildanus described an ileal diverticulum, which was thoroughly scrutinized and defined by Johann Meckel in 1809 [1].

Meckel's diverticulum is generally seen as an incidental finding at laparotomy [2]. Its blood supply is usually from small bowel mesentery, or a separate mesodiverticular band. The symptomatic cases usually present with gastrointestinal bleeding, inflammation or intestinal obstruction which is the most common presentation in adults [3]. It is rarely reported to be the source of intra-abdominal hemorrhage. Meckel's diverticulum may also present with rupture secondary to blunt trauma [1], or as iron deficiency anemia with or without episodes of overt hemorrhage [4]. The first case of ruptured Meckel's diverticulum was reported by Blanc in 1899 [5]. However, traumatic rupture of Meckel's diverticulum has been reported previously in few instances [6, 7]. Here, we present a 36-year-old man with abdominal pain following a blunt trauma to the abdomen, sustained during an automobile accident. This appears to be unique in that no similar case of combined ruptured Meckel's diverticulum and mesodiverticular rupture has been reported previously.

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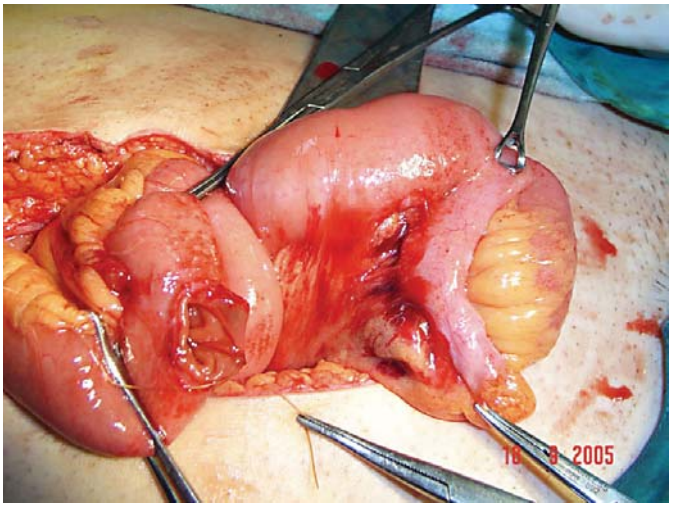

Fig. 1. The ruptured Meckel's diverticulum (from the base).

Case Report

A 36-year-old man was referred to Namazee Hospital Emergency Room, Shiraz, Iran, following a head-on automobile collision in which his lower abdomen and pelvis were restrained by a seat belt. He complained of lower abdominal pain that gradually extended into upper parts. On physical examination, he had severe abdominal guarding and rigidity. Blood pressure and pulse rate were 120/95 mm Hg and 110/min, respectively. He was taken to the operating theater with a preoperative impression of peritonitis due to rupture of a hollow viscus.

Upon abdominal exploration through the midline incision, approximately 700 ml free blood, food particles, and an ileal rupture were observed. In addition, there was a ruptured Meckel's diverticulum (from the base) with active bleeding from mesodiverticular rupture (fig. 1). The mesentery of this diverticulum was the major source of intra-abdominal bleeding and the ileal rupture was the cause of contamination. The diverticulum measured 7 × 2 × 1 cm. After immediate evacuation of peritoneal contents, the ileum was repaired in two layers: a segmental bowel resection including Meckel's diverticulum was performed, and the gastrointestinal tube was anastomosed without any tension. The patient had a normal postoperative course. The histological examination of the specimen revealed that the diverticulum was lined by gastric mucosa.

Discussion

The embryonic gut communicates with the yolk sac through the vitelline duct. The blood supply to the duct arises from paired ventral branches of the abdominal aorta, the 'vitelline arteries'. The proximal right vitelline artery eventually becomes superior mesenteric artery, while the left vitelline artery involutes. A Meckel's diverticulum results if the proximal duct fails to be obliterated. A remnant of the vitelline artery occasionally remains attached to the diverticulum as a fibrous band extending from the apex of the mesentery (the mesodiverticulum band) [4, 8].

This separate band was previously recognized as a cause of intestinal obstruction, in 5–15% of Meckel's diverticula [4, 9, 10]. Despite its proven vascularity, bleeding from vitelline artery remnants has rarely been reported. A case of spontaneous hemorrhage from a torn mesodiverticular band was reported in 1981 [11]; additionally, traumatic rupture of Meckel's diverticulum has been reported previously in a few instances [6, 7].

The present case appears to be unique among previous reports in which a blunt abdominal trauma tore the ileum, the mesodiverticulum and ruptured the Meckel's diverticular base simultaneously, resulting in hemoperitoneum and chemical peritonitis. Previously, blunt abdominal trauma has been frequently noted in seat-belt wearers [12]. Seat belt use prevents head injuries and decreases the overall mortality rate associated with traffic accidents. However, the use of seat belts has changed the pattern of injuries sustained in collisions [13]. Small bowel injuries are the most common traumas sustained among seat belt wearers, and over half of patients with small bowel injuries are reported to sustain more than one injury [12]. Physicians evaluating trauma victims after motor vehicle accidents should be aware of the fact that the types of abdominal injuries may vary substantially depending on seat belt use and the underlying congenital anomaly of intestine.

Use of seat belt, sudden shearing forces due to rapid deceleration and rising intra-abdominal pressure are the possible causes of mesodiverticular rupture in this case.

Diagnosis and management of this type of injury are basically the same as those of acute surgical abdomen following trauma.

Conclusion

This case shows that a blunt abdominal trauma can tear the mesodiverticulum and rupture the Meckel's diverticular base simultaneously, resulting in hemoperitoneum and chemical peritonitis.

References

1 Park H, Lucas CE: Perforated Meckel's diverticulum following blunt abdominal trauma. J Trauma 1970;10:706–707.
2 Fraser J, McCartney JE: A case of persistent vitelline artery: fatal intraabdominal hemorrhage from rupture of the vessel. Br J Surg 1921;8:478–480.
3 Diamond T, Russell CF: Meckel's diverticulum in the adult. Br J Surg 1985;72:480–482.
4 Dumper J, Mackenzie S, Mitchell P, Sutherland F, Quan ML, Mew D: Complications of Meckel's diverticula in adults. Can J Surg 2006;49:353–357.
5 Alhadeff R: Perforation of Meckel's diverticulum by foreign body and review of the literature. Br J Surg 1955;42:527–530.
6 Moses WR: Meckel's diverticulum: a report of two unusual cases. N Engl J Med 1947;237:118–122.
7 McAneny D, Rapo SE, Grindlinger GA: Traumatic hemoperitoneum due to a Meckel's mesodiverticular band: case report. J Trauma 1989;29:261–262.
8 Turgeon DK, Barnett JL: Meckel diverticulum. Am J Gastroenterol 1990;85:777–781.
9 Rutherford RB, Akers DR: Meckel's diverticulum: a review of 148 pediatric patients, with special reference to the pattern of bleeding and to mesodiverticular vascular bands. Surgery 1966;59:618–626.
10 Williams RS: Management of Meckel's diverticulum. Br J Surg 1981;68:477–480.
11 Vellacott KD: Haemoperitoneum due to Meckel's diverticulum. J R Coll Surg Edinb 1981;26:89–90.
12 Appleby JP, Nagy AG: Abdominal injuries associated with the use of seatbelts. Am J Surg 1989;157:457–458.
13 Rutledge R, Thomason M, Oller D, Meredith W, Moylan J, Clancy T, Cunningham P, Baker C: The spectrum of abdominal injuries associated with the use of seat belts. J Trauma 1991;31:820–826.