

Rupture of Meckel's diverticulum after a blunt abdominal trauma

CASE REPORT

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Abstract

Background: Meckel's diverticulum is relatively rare in the general population. Generally, symptoms are extremely varied and prior diagnosis is difficult because of the abnormality being an occasional finding in laparotomies. This report describes the unusual possibility of basement of diverticulum rupture, even after low-impact abdominal trauma. The case is unusual because of the low frequency of small bowel injury in abdominal contusions, except in trauma with high kinetic energy, such as high-speed car crashes, and the unexpected finding of a ruptured base of diverticulum. Usually, the lesions occur at relatively fixed structures, specifically in the angle of Treitz or ileocecal region, after undergoing stretching.

Case presentation: A 32-year-old male patient presented at another service after incurring a trauma in a car crash about 5 hours earlier. He complained of abdominal pain of moderate intensity and intense thirst. Bruises were found on the mesogastric region. Ultrasonography and computed tomography suggested the presence of a small amount of free fluid in the abdominal cavity and pneumoperitoneum. Emergency exploratory laparotomy was performed because of the free fluid and air blood and faecal content in the peritoneal cavity. A single lesion, the contusion in Meckel's diverticulum and perforation at base of diverticulum, was observed. Excision of the segment was performed with thorough washing of the cavity.

Conclusion: Patients with Meckel's diverticulum may be more susceptible to hollow viscus rupture and can be a finding in exploratory laparotomy. Controversy exists when the MD is an occasional finding. The current recommendation is surgical removal due to the low risk of complication of the procedure. Thereby avoiding possible future complications.

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Keywords

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Background

Meckel's diverticulum (MD) was first described in 1650 by Hildanus [1-3]. It is the most common malformation of the gastrointestinal tract, affecting 0.4% to 3% of the general population, with a male-to-female prevalence of 2:1 [4]. MD results from incomplete closure and obliteration of the proximal portion of the omphalomesenteric duct, near the ileo-cecal valve [5]. Usually, it is small, wide-mouthed, and located in the anti-mesenteric border in the distal 100 cm of the ileum. In approximately 55% of cases, ectopic mucosa (usually gastric or pancreatic) is present. In most cases, it is asymptomatic and is an incidental finding during abdominal surgery or autopsy. However, 15% to 20% of cases may be associated with abdominal pain and complications, including haemorrhage, and intestinal obstruction or perforation, etc [6-8].

In patients with trauma, we highlight lesions that affect the hollow viscus due to their high morbidity and mortality, especially in delayed diagnosis [9]. Although the mechanism of trauma allows inferences about the type of injury, diagnosis is extremely difficult because of the lack of specific clinical and radiological findings, and the association with other serious injuries that mask or prevent a proper evaluation of the abdomen [10].

Although the clinical and histo-pathological characteristics, and complications of MD are well known, its preoperative diagnosis is difficult, as it is a rare condition. It may mimic other causes of acute abdomen, and imaging findings are nonspecific [11, 12]. Symptomatic MD is synonymous with the presence of complications.

Injury to the hollow viscus cause symptoms via the combination of blood loss and contamination of the peritoneal cavity, and severe clinical signs may take a while to emerge [13]. The trauma to the anterior wall of the abdomen often leads to injuries of the hollow viscus, although injuries to the back and buttocks can also reach intra-cavitary organs. Treatment is usually surgical [14-16].

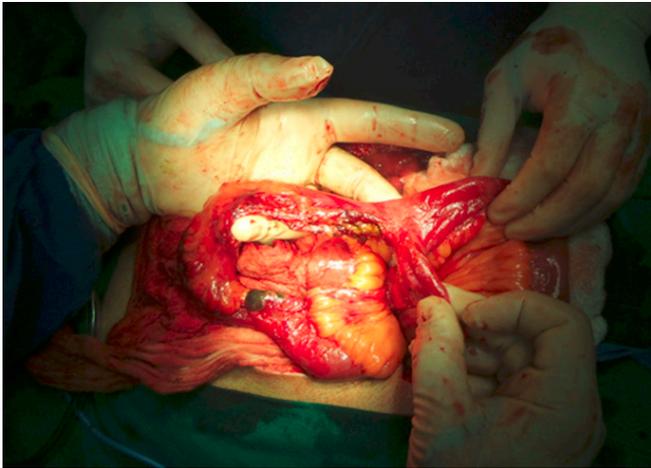
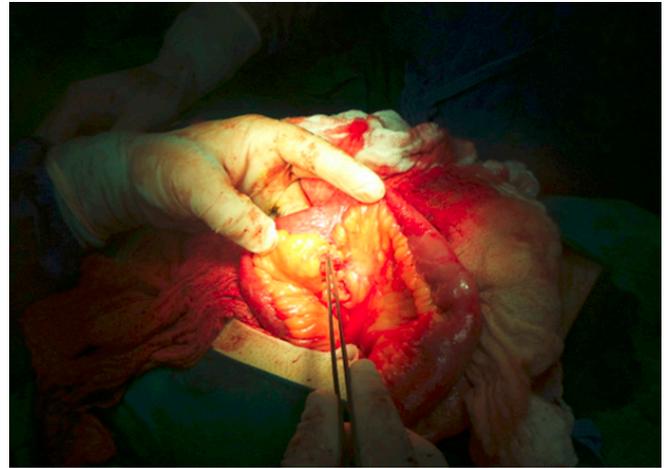
The small intestine is the viscera most affected by penetrating abdominal trauma due to the large volume it occupies in the abdomen. Small bowel injuries are infrequent in contusions, although they are found in traumas with high kinetic energy such as high-speed car crashes [15]. They usually occur in the angle of Treitz and ileocecal region, which are relatively fixed regions, which undergo stretching [16]. They may also be associated with abrupt and localized compression. In trauma patients who present with linear abdominal bruising (seat belt sign), the possibility of small bowel Injury should be considered [17]. The chosen approach is frequently surgical because of the tendency of the Injury for severe bleeding and segmental ischemia; hence, diagnosis should be performed as early as possible.

Case presentation

A 32-year-old, male brown patient who was a driver presented from another service after incurring a blunt abdominal trauma in a car crash approximately 5 hours earlier. He complained of abdominal pain of moderate intensity and intense thirst. He denied any previous medical or surgical pathology. The patient presented with bruises on the mesogastric region, and was lucid and cooperative. Ultrasonography and computed tomography suggested a small amount of free fluid in the abdominal cavity and pneumoperitoneum. Emergency exploratory laparotomy was performed, and blood and faecal content was observed in the peritoneal cavity. A single lesion, the contusion in MD, was present. Excision was performed with thorough washing of the cavity.

Conclusions

Injuries of the hollow viscus are frequent in abdominal trauma, are sometimes difficult to diagnose, and are known for their high morbidity and mortality [18]. Physical examination remains as the primary method of diagnosis of abdominal injuries, and the treatment is emergency surgery [19, 20].

Figure 1: Ruptured base of diverticulum.**Figure 2:** after surgical procedure.

Preoperative diagnosis of MD is difficult and imaging tests, such as ultrasonography and computed tomography are nonspecific [21]. Controversy exists when the MD is an occasional finding. The current recommendation is surgical removal due to the low risk of complication of the procedure. Thereby avoiding possible future complications. Our approach is enterectomy segment with end-to-end primary reconstruction because it reduces the risk of residual ectopic mucosa at the base of the ileum. In the presence of MD drilled associated with peritonitis, we chose proximal ileostomy, since primary anastomosis at high risk of complications in this situation.

This case reports a rare case of blunt abdominal trauma with rupture of MD and intends to call attention to the possibility of its existence and the need for an earliest possible diagnosis to minimize complications, as diverticulum tissues are friable and may be at risk of injury from lower-energy impacts compared with common small intestine injuries.

Consent

The patient received appropriate guidance and signed the "Free and Informed Term of Consent" form.

List of abbreviations

MD: Meckel's diverticulum

HRC: Cariri Regional Hospital

Competing interests

The authors declare no conflicts of interests.

The case report was submitted to the Research Ethics Committee of Hospital Regional do Cariri.

The authors rigorously complied with the criteria defined in the Declaration of Helsinki.

Authors' contributions

HMTB conceived and conducted the case study. All the authors read and approved the final manuscript.

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References

- Malik AA, Wani KA, Khaja AR: Meckel's diverticulum revisited. *Saudi J Gastroenterol* 2010, 16:3-7.
- Zani A, Eaton S, Rees CM, Pierro A: Incidentally detected Meckel diverticulum: to resect or not to resect? *Annals of Surgery*: 2008; 247(2): 276-81
- Nicholas JM, Rix EP, Easley KA, Feliciano DV, Cava RA, Ingram WV, Parry NG, Rozycki GS, Jeffrey D, Tremblay LN. Changing Patterns in the Management of Penetrating Abdominal Trauma: The More Things Change, the More They Stay the Same. *Journal of Trauma-Injury Infection & Critical Care*: 2003; 55(6): 1095-110
- Germanos S, Gourgiotis S, Villias C, Bertucci M, Dimopoulos N, Salemis N: Damage control surgery in the abdomen: an approach for the management of severe injured patients. *Int J Surg* 2008, 6: 246-252.
- Rotondo MF, Zonies DH: The damage control sequence and underlying logic. *Surg Clin North Am* 1997, 77: 761-777.
- Committee on Trauma: *Advanced Trauma Life Support Student Course Manual*. Chicago: American College of Surgeons; 2004.
- Varcoe RL, Wong SW, Taylor CF, Newstead GL: Diverticulectomy is inadequate treatment for short Meckel's diverticulum with heterotopic mucosa. *ANZ J Surg* 2004, 74: 869-872.
- Motta DC, Scarpelini S: Lesões traumáticas de vísceras ocas. *Medicina (Ribeirão Preto)* 2007, 40(4): 531-537, out./dez.
- Leite S, Gomes AT, Sousa H: Visceral *Injury* in abdominal trauma: a retrospective study. *Acta Med Port* 2013, 26(6): 725-730.
- Faria RG, Almeida AB, Moreira H, Barbosa E, Correia-da-Silva P, Costa-Maia J: Prognostic factors for traumatic bowel injuries: killing time. *World J Surg* 2012, 36: 807-812.
- Fleming S, Bird R, Ratnasingham K, Sarker S, Walsh M, Patel B: Accuracy of FAST scan in blunt abdominal trauma in a major London trauma centre. *Int J Surg* 2012, 10: 470-474.
- Brooks A, Simpson J: Blunt and penetrating abdominal trauma. *Abdominal Surg* 2009, 27: 6.
- Leite S, Gomes AT, Sousa H. Visceral *Injury* in Abdominal Trauma: A Retrospective Study. *Acta Med Port* 2013; 26(6): 725-30
- McStay C, Ringwelski A, Levy P, Legome E: Hollow viscus injury. *J Emerg Med* 2009, 37: 293-299.
- Tan K, Liu JZ, Go T, Vijayan A, Chiu M. Computed tomography has an important role in hollow viscus and mesenteric injuries after blunt abdominal trauma. *Injury* 2010, 41: 475-478.
- Campillo-Soto A, Soria-Aledo V, Renedo-Villarroya A, Millán MJ, Flores-Pastor B, Girela-Baena E, De Andrés-García B, Carrillo-Alcaraz A, Martín-Lorenzo JG, Aguayo-Albasini JL. Utilidad de la tomografía computari-zada para el diagnóstico de lesiones intestinales y mesentéricas en el trauma abdominal cerrado. *Cir Esp* 2009, 85: 341-347.
- Moore EE, Cogbill TH, Malangoni MA, Jurkovich GJ, Champion HR, Gennarelli TA, McAninch JW, Pachter HL, Shackford SR, Trafton PG: Organ *Injury* scaling II. Pancreas, duodenum, small bowel, colon and rectum. *J Trauma* 1990, 30(11): 1427-29.
- Shah K, Khiria L, Desai P, Vora H, Bhavsar M. Surgically inverting an incidentally detected Meckel's diverticulum - Wrong method. *Int J Surg Case Rep*. 2015; 6C: 289-91
- Altaf A, Aref H. A case report: Cecal volvulus caused by Meckel's diverticulum. *Int J Surg Case Rep*. 2014; 5(12): 1200-2.
- Okur MH, Arslan MS, Aydogdu B, Uygun I, Goya C, Tokgöz O, Otcu S. Perforation of Meckel's diverticulum by foreign body. *J Pak Med Assoc*. 2014 Jul; 64(7): 826-7.
- Clark JK, Paz DA, Ghahremani GG. Imaging of Meckel's diverticulum in adults: pictorial essay. 2014 Sep-Oct; 38(5): 557-64.

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