CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 28 (2016) 237–240

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Meckel's diverticulum perforation by a fish bone: A case report

André Gonçalves*, Marinho Almeida, Luís Malheiro, J. Costa-Maia

Serviço de Cirurgia Geral do Centro Hospitalar de S. Joao, Porto, Portugal

ARTICLE INFO

Article history:
Received 12 July 2016
Accepted 13 August 2016
Available online 7 September 2016

Keywords:
Meckel diverticulum
Intestinal perforation
Foreign bodies
Case report

ABSTRACT

INTRODUCTION: Meckel's diverticulum is the most common congenital abnormality of the gastrointestinal tract. The perforation of a Meckel's diverticulum by a foreign body is a very rare complication.
CASE PRESENTATION: A 61-year-old male presented to the Emergency Department with complaints with abdominal pain and fever, and abdominal rebound tenderness on physical examination. An intestinal perforation by a foreign body was diagnosed by CT scan. The patient was submitted to a diagnostic laparoscopy and a perforation of a Meckel's diverticulum by a foreign body was identified. The foreign body was removed and a stapled diverticulectomy was performed.
DISCUSSION: Meckel's diverticulum is asymptomatic in most of the affected individuals, with a 4.2–16.9% probability of symptomatic presentations. The clinical presentation ranges from intestinal obstruction, to bleeding, inflammation and perforation. While children with Meckel's diverticulum present more often with gastrointestinal bleeding, intestinal obstruction is the most common presentation in adults. Foreign body perforation of a Meckel's diverticulum is an extremely rare event. There is general agreement that a symptomatic Meckel's diverticulum should be resected. Laparoscopy is a safe diagnostic and therapeutic tool that can decrease diagnostic time and theoretically avoids the morbidity and mortality of a delayed diagnosis.
CONCLUSION: The perforation of a Meckel diverticulum by a foreign body is an extremely rare event and may have a bad prognosis in case of a delayed diagnosis.

1. Introduction

Meckel's diverticulum is the most common congenital abnormality of the gastrointestinal tract [1]. Although first described by Fabricius Hildanus in 1958, it was named after Johann Friedrich Meckel, who established its embryological origin in 1809 [2]. Meckel's diverticulum is caused by the failure of the omphalomesenteric duct to recede during gestational weeks 5–7 [3].

The described incidence is approximately 2% of the population [4]. Most patients are asymptomatic, with only 4–16% presenting complications [5], the three most common being inflammation, haemorrhage, and intestinal obstruction [6].

The perforation of a Meckel's diverticulum by a foreign body is a very rare complication, with few cases reported in the literature [7]. We present the case of a perforation of a Meckel's diverticulum by an intact fish bone.

2. Case presentation

A 61-year-old caucasian male presented to the Emergency Department with complaints with a 24h-evolution of abdominal pain in the right iliac fossa, with insidious onset and increasing severity. There were no associated complaints. On physical examination the patient presented fever (38 °C) and abdominal rebound tenderness located on the right iliac fossa.

His past medical history was relevant for obesity, arterial hypertension, dyslipidemia, type 2 diabetes and hypoacusia, with no previous abdominal surgery.

Initial laboratory workup revealed normal white blood cell count, but increased C-reactive protein level of 22.7 mg/L (Normal range < 3.0 mg/dL). An abdominal CT scan was performed, not confirming the clinical suspicion of acute appendicitis and revealing a linear, 25 mm, hyperdense foreign body inside the ileal lumen, without free abdominal air or fluid (Fig. 1).

A presumed diagnosis of intestinal perforation was then established and the patient was submitted to diagnostic laparoscopy.

Intraoperatively, after dissection of inflammatory ileal loop adhesions to the abdominal wall, a perforation of the tip of a Meckel's diverticulum by a foreign body was identified. The foreign body was removed and a stapled diverticulectomy was performed, with the endo-stapler applied to the base of the diverticulum, perpendicular to the long axis of the ileum. The foreign body was identified as an intact fish bone. The post-operative course was uneventful, and the patient was discharged on the 4th post-operative day (Figs. 2 and 3).

* Corresponding author at. Serviço de Cirurgia Geral do Centro Hospitalar de Sao Joao, Alameda Prof. Hernani Monteiro, 4200-319 Porto, Portugal
E-mail address: afgoncalves85@mail.com (A. Gonçalves).

http://dx.doi.org/10.1016/j.ijscr.2016.08.026

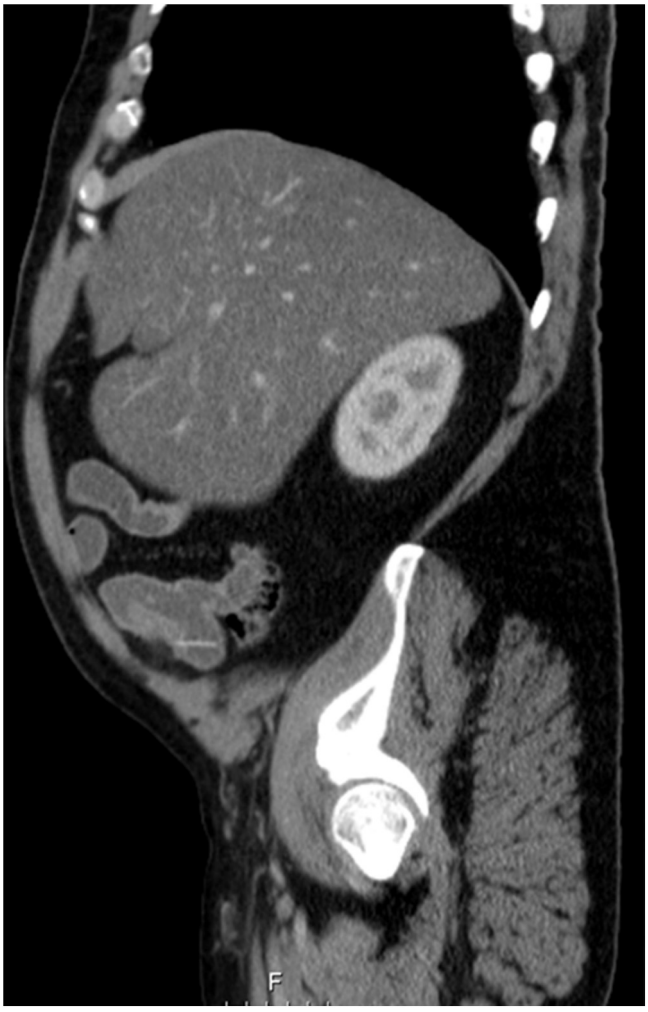

Fig. 1. CT scan showing the foreign body inside the ileal lumen.

Histopathology confirmed a Meckel's diverticulum with $3.2 \times 2.3 \times 2.1$ cm, with all layers of intestinal wall and no ectopic mucosa. A thin, long tract from the mucosa to the serosa with associated inflammation was also identified (Fig. 4).

The patient was observed after the first post-operative month with no complaints.

3. Discussion

Meckel's diverticulum is the most common congenital gastrointestinal malformation, with an incidence of 2–4% [8]. It consists of a small outpouching of the gastrointestinal tract due the incomplete obliteration of the omphalomesenteric duct between the 5th to 7th weeks of fetal life [1].

Meckel's diverticulum has been commonly referred to by the "rule of twos": it is usually located in the 2 ft. proximal to the ileocecal valve, presents more often before the age of 2 years, is seen twice as commonly in men as in women, and is found in about 2% of the population [9]. The classic diagnostic criteria for Meckel's diverticulum, present in 90% of cases, are: the diverticulum has to be located on the antimesenteric border, within 2 ft. proximal to the ileocecal valve, contain the five layers of the small intestine, and have its own blood supply [10].

Meckel's diverticulum is a true diverticulum containing all the layers of the intestinal wall [11]. The position of the Meckel's diverticulum along the length of the small intestine is variable, but is usually found within 100 cm of the ileocecal valve [11]. On average it is 2.9 cm long and 1.9 cm wide [12]. In up to 55% of Meckel's diverticula there is heterotopic mucosa – gastric and pancreatic tissue predominate- with corresponding incidences of 60–85% and 5–16% [13]. In the present case, pathology confirmed that we were facing a true diverticulum with all the layers of the intestinal wall, but with no heterotopic mucosa. The 3.2 cm-long and 2.3 cm-wide diverticulum was located on the anti-mesenteric border, 70 cm from the ileocecal valve.

While Meckel's diverticulum remains mostly asymptomatic in affected individuals, there is a 4.2–16.9% probability of symptomatic presentations [6], and 60% of patients come to medical attention before the age of 10 years [10]. The clinical presentation ranges from intestinal obstruction, to bleeding, inflammation and perforation [8]. While children with Meckel's diverticulum present more often with gastrointestinal bleeding, intestinal obstruction is the most common presentation in adults [12].

Foreign body perforation of a Meckel's diverticulum is an extremely rare event, since the majority of ingested objects pass through the gastrointestinal tract without problem [1,2]. In a large review, the rate of resection due to perforation by a foreign body was reported as 8% of all complicated diverticula [14]. According to Chan et al. [9], a total of 300 cases of perforation of a Meckel's diverticulum by a swallowed foreign body were reported in the literature. Perforation of a Meckel's diverticulum has been associated with many bizarre foreign bodies, including chicken bone [2,6,9,15], bay leaf [16], wood splinter [1], mellon seeds [17], and fish bone [7,11,18]. According to Wong et al. [7] in 2005 there were only four cases of fish bone perforation of a Meckel's diverticulum reported. There seems to be a tendency for foreign bodies to lodge in the blind pouch of Meckel's diverticulum [7]. Usually the patient does not recall the ingestion of the foreign body [2].

As Charles Mayo once said: «Meckel's diverticulum is frequently suspected, often looked for, but seldom found» [8], with fewer than 10% of symptomatic Meckel's diverticula diagnosed preoperatively [19], with acute appendicitis being the most common preoperative diagnosis [1]. Plain film, ultrasound and CT scan can be normal or show non-specific changes [19]. Small bowel contrast studies may demonstrate the diverticulum, however the sensivity of this test is not well established [20]. On CT scan the appearance of a Meckel's diverticulum resembles a normal bowel loop [20], and, as in the present case, the diagnosis is only achieved intraoperatively.

The approach to treatment of a Meckel's diverticulum depends on whether it was discovered incidentally or as a result of symptom [13]. There is a large debate in the literature on asymptomatic Meckel's diverticulum, but since the incidence of complications from prophylactic resection is approximately 1% and the lifelong potential complication rate is 5–6% in all individuals with Meckel's diverticulum, there is growing evidence that an incidentally detected diverticulum should be resected except when a complicating condition such as peritonitis, patient instability or ascites co-exists [10].

There is general agreement that a symptomatic Meckel's diverticulum should be resected [19]. The surgical options are simple diverticulectomy or segmental bowel resection and anastomosis [8]. To avoid narrowing the ileal lumen, transverse suturing, either hand-made or mechanical, is preferred [4,11]. Bowel resection is indicated in cases where the diverticulum has a wide mouth with ectopic tissue, when an inflammatory or ischemic process involves the adjacent ileum, if there is involvement of the Meckel's diverticulum by tumors, or when the base of diverticulum is edematous, inflammed or perforated [10].

Compared to conventional open procedures, laparoscopy is a safe diagnostic and therapeutic tool that can decrease diagnostic time and theoretically avoids the morbidity and mortality of a