Inverted Meckel's diverticulum as a rare cause of severe gastrointestinal bleeding in an elderly patient

Case report of a 67-year-old woman and review of the literature

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Summary

We report an unusual case of severe bleeding from inverted Meckel's diverticulum in a 67-year-old woman. Her disease was presented with painless acute gastrointestinal bleeding. Enteroclysis revealed a large pedunculated ileal polyp 80 cm proximal to the ileo-caecal valve. Intra-operative enteroscopy was carried out as the next step and an inverted Meckel's diverticulum was found with three ulcers. The diverticulum was resected surgically. The postoperative course was uneventful and the patient was released from hospital ten days later.

Key words: *inverted Meckel's diverticulum, acute bleeding, intra-operative enteroscopy*

Souhrn

Reverzní Meckelův divertikl jako neobvyklý zdroj závažného gastrointestinálního krvácení u starší pacientky. Kazuistika 67leté ženy a přehled literatury

V kazuistice je popsán neobvyklý případ závažného krvácení z reverzního Meckelova divertiklu u 67leté ženy. Onemocnění se projevilo bezbolestným akutním gastrointestinálním krvácením. Na enteroklýze byl v ileu, 80 cm před ileocekální chlopní, zjištěn velký pendlující polyp. Při intraoperační enteroskopii byl zjištěn reverzní Meckelův divertikl se třemi ulceracemi. Divertikl byl resekován chirurgicky. Pooperační průběh byl bez komplikací.

Klíčová slova: *reverzní Meckelův divertikl, akutní krvácení, intraoperační enteroskopie*

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract (1–3% of the population in autopsy studies, twice as more frequently found in males). It derives from incomplete obliteration of the yolk stalk (omphalo-mesenteric duct). Meckel's diverticulum is a true diverticulum with all layers of the intestinal wall present. It arises from the antimesenterial border, located usually 100 cm proximal to the ileo-caecal valve, has its own mesentery and blood supply from a terminal branch of the superior mesenteric artery. Diverticula that do not contain normal ileal mucosa may harbour ectopic glandular tissue: gastric (~ 50%), duodenal Brunner's glands, pancreatic acinar tissue, colonic mucosa, endometrium, hepatobiliary tissue or their combination. Meckel's diverticulum is usually asymptomatic, only about 2% develop a complication over the course of their life. 60% of patients having complications are younger than two years, painless bleeding (from peptic ulceration in ectopic gastric mucosa) is the most common. Helicobacter pylori may colonise the gastric mucosa of Meckel's diverticulum but it likely plays no role in bleeding diverticula. Other complications of Meckel's diverticulum comprise diverticulitis, iron deficiency anaemia, intestinal obstruction and

perforation (from foreign bodies, diverticulitis, peptic ulceration or blunt abdominal trauma). A longer diverticulum (length > 2 cm) is associated with a higher risk of complications. Bacterial overgrowth, intussusception, volvulus, strangulation, Littre's herniation, phytobezoars, formation of enteroliths and malignant transformation (carcinoid, adenocarcinoma or leiomyosarcoma) are all very unusual [8,9,11,18,21,22,24,25,30,31,38,40].

We report an unusual case of severe gastrointestinal bleeding from inverted Meckel's diverticulum in an elderly patient.

CASE REPORT

A 67-year-old woman was treated for iron deficiency anaemia for the past 5 years. Suddenly her disease was presented with painless severe gastrointestinal bleeding (fresh melaena) elsewhere. Bleeding required 6 units of blood within 24 hours. The source of the bleeding was not identified either by gastroscopy or colonoscopy and the patient was referred to our Department as a case of acute obscure overt bleeding. Enteroclysis revealed a large polyp (8 cm in length) 80 cm proximal to the ileo-caecal valve and nearly obstructing the entire intestinal lumen (Fig. 1). Intra-operative enteroscopy was carried out as the next step and an inverted Meckel's diverticulum was found with three ulcers (one of them with adhering blood clot) (Figs 2, 3). The surgeon decided to resect the diverticulum together with 10 cm of the adjacent ileum. Histology confirmed Meckel's diverticulum. The postoperative course was uneventful and the patient was released from hospital ten days later.

DISCUSSION

We present a remarkable case of inverted Meckel's diverticulum as a quite rare cause of painless severe acute gastrointestinal bleeding. Meckel's diverticulum is the most common

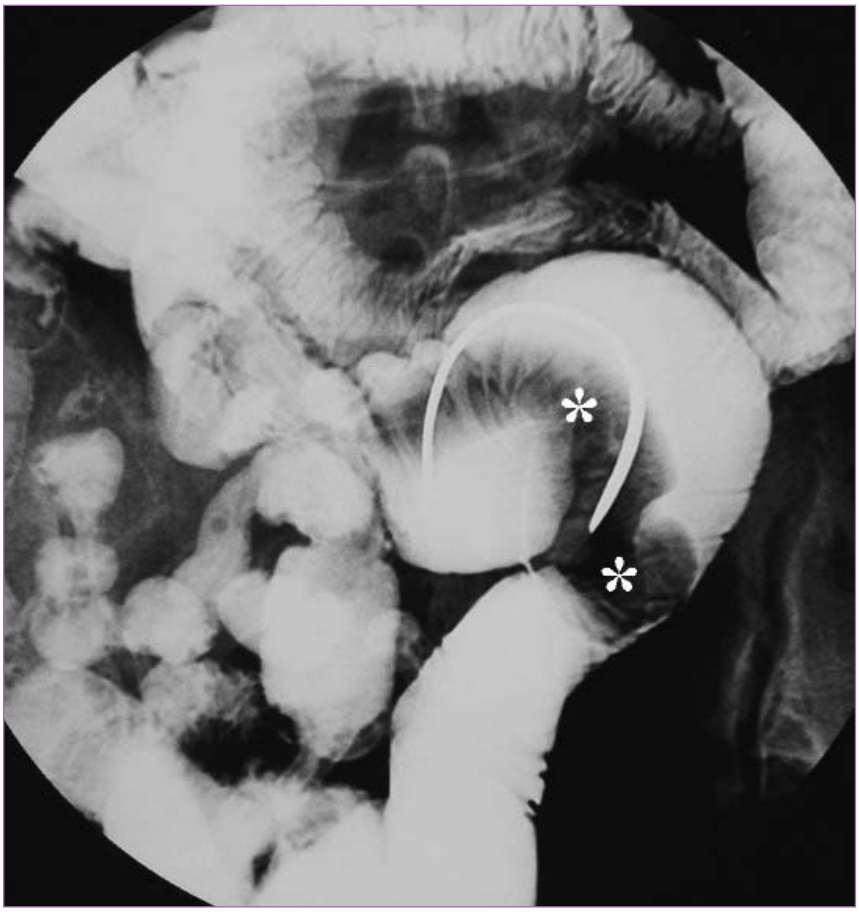

Fig. 1.
Enteroclysis. Smoothly marginated intraluminal mass in the ileum simulated an intraluminal polyp (asterisks).

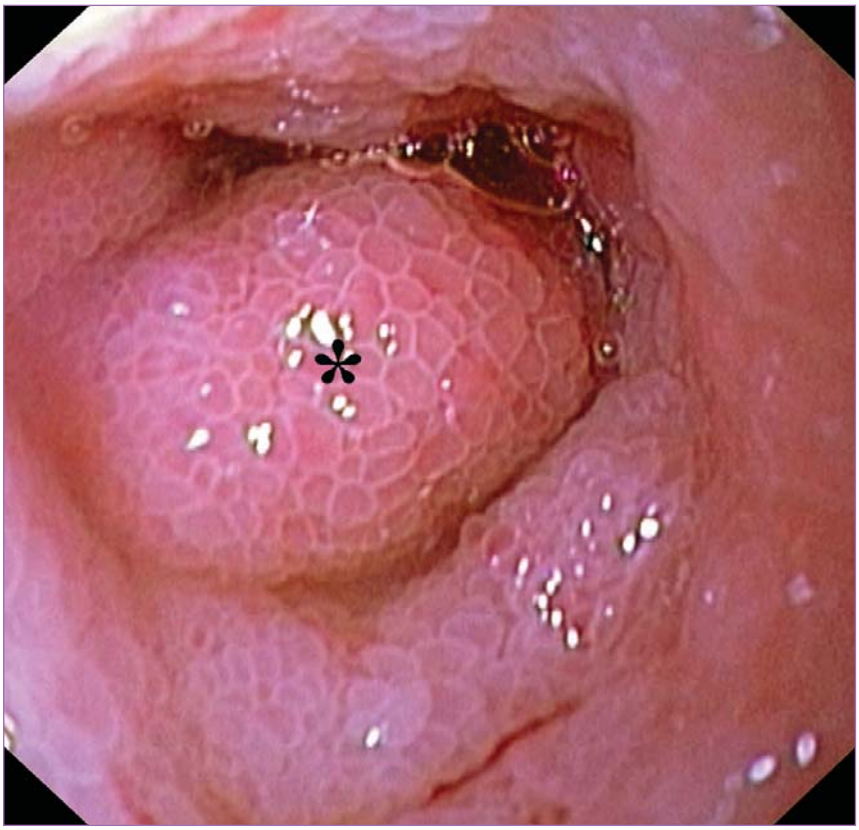

Fig. 2.
Intra-operative enteroscopy. Obstruction of the ileum caused by inverted Meckel's diverticulum. Swollen mucosa of the diverticulum is nicely visible (asterisk).

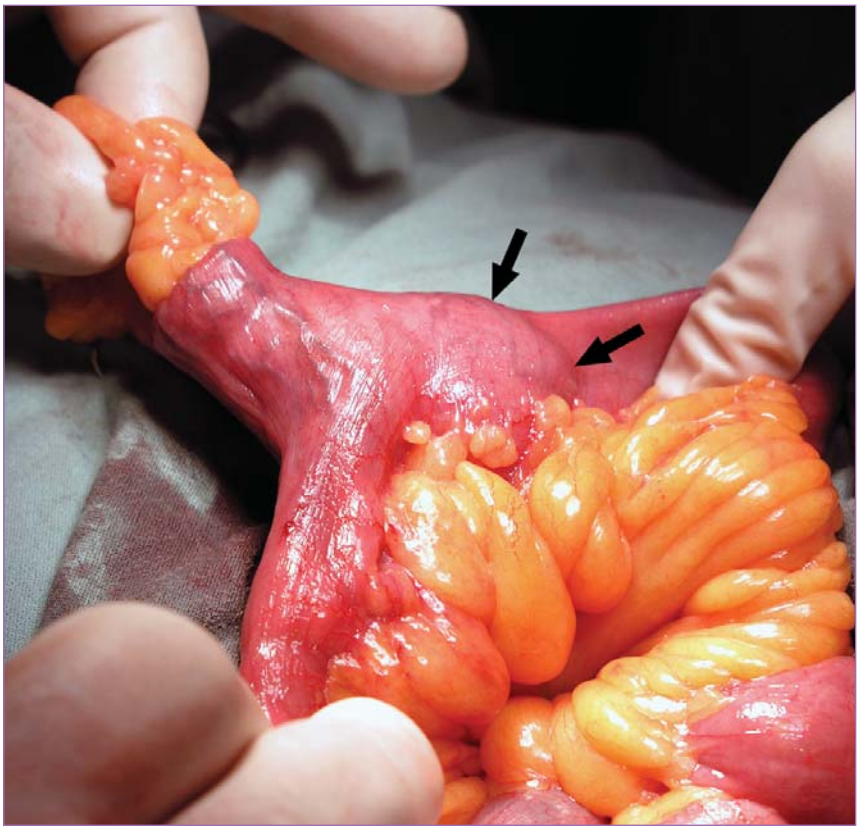

Fig. 3.
Surgical field - view of open abdominal cavity. Extraction of the Meckel's diverticulum; large part of it is still inverted (arrows).

congenital anomaly of the gastrointestinal tract but we have found only a few reports of inverted diverticulum [3,6,10,12,14,17,19,29,32,36,39] and only three cases similar to ours [1, 20,34]. Other cases presented with iron deficiency anaemia [32], diarrhoea and vomiting [12], strangulated intestinal obstruction [39], intussusception [10,19,36], mimicking tumour [3,6] or Crohn's disease [17]. Once inverted, the diverticulum may serve as the site of intestinal obstruction or lead point for an ileo-ileal or ileo-colic intussusception [25].

More than 2 800 papers were published on Meckel's diverticulum over the past five decades (according to a PubMed search). However, most publications have been either small series or case reports. The largest series was published by Park et al as the Mayo Clinic experience with 1,476 patients (collected from 1950 to 2002) [30]. Only 16% were symptomatic. Among 180 adult patients, bleeding (69/180; 38%), obstruction (61/180; 34%) and diverticulitis (50/180; 28%) were the most common complications. The authors do not mention any case of inverted Meckel's diverticulum [30].

Soltero and Bill [35] calculated in their retrospective study of 202 patients that lifetime risk of complication from a Meckel's diverticulum is 4% up to the age of 20.2% up to the age of 40 years, and zero in the elderly population. The authors of the Olmsted County (Minnesota) Study stated that the lifetime risk (to 80 years of age) of developing any complication of Meckel's diverticulum was 6.4% [7].

A ^{99m}technetium pertechnate scintigraphy is a principal investigation, it detects ectopic gastric mucosa in Meckel's diverticulum, pre-treatment with pentagastrin or H_2-receptor antagonists reduces false negative results. Pentagastrin accelerates Tc uptake and an H_2-receptor antagonist decreases Tc release by the gastric mucosa [11]. However, only one half of Meckel's diverticula harbour gastric mucosa. Other diagnostic tools comprise (CT/MRI) enteroclysis [13], intraoperative enteroscopy [23], Doppler ultrasonography [2], angiography [33] and recently wireless capsule endoscopy [16,26,27,37] and double balloon enteroscopy [4,5,15,28].

Abdominal radiographic findings are most often non-specific in these cases unless the patients have intestinal obstruction or intussusception. Enteroclysis shows an elongated, smoothly marginated intraluminal mass that parallels the long axis of the intestine and frequently has a bulbous or club-like tip [25]. It may also appear as a pedunculated intraluminal polyp [34]. CT characteristically shows the inverted diverticulum as a central core of fat attenuation surrounded by a collar of soft-tissue attenuation. At sonography, the inverted diverticulum has a target-like appearance with central hyperechogenicity from the core of mesenteric fat or a double target appearance when the entire section of the small intestine containing the inverted diverticulum is visualised [29]. Doppler sonography may reveal anomalous vessels [2]. The differential diagnosis for an elongated tubular filling defect produced by an inverted Meckel's diverticulum on barium images of the small intestine includes elongated pedunculated polyps such as Peutz-Jeghers syndrome [25]. The principal differential diagnosis for an inverted Meckel's diverticulum on CT scans is a lipoma [3,20]. Intestinal lipomas have fat attenuation at CT but they lack the collar of soft-tissue attenuation that is seen in inverted Meckel's diverticulum [25]. When the vitalline artery is seen in the ilea lumen on angiography, inverted Meckel's diverticulum should be considered [33].

In our particular case, inverted Meckel's diverticulum also mimicked elongated pedunculated polyp on

enteroclysis. It was not until intra-operative enteroscopy that the correct diagnosis was determined. Surgical resection in the same anaesthesia provided a final solution.

CONCLUSIONS

Meckel's diverticulum is the most common anomaly of the gastrointestinal tract. However, most of them are asymptomatic lifelong. Clinical symptoms arise from complications of the diverticulum which are very rare in elderly people. Preoperative diagnosis of a complicated Meckel's diverticulum may be challenging because clinical and imaging features overlap with those of other causes of acute abdomen. In case of severe painless acute obscure overt bleeding Meckel's diverticulum should be considered even in elderly patients. Capsule endoscopy, double balloon enteroscopy and ultimately intra-operative enteroscopy may be helpful in timely diagnosis.

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