Iron Deficiency Anaemia: An Unusual Complication of Meckel's Diverticulum

Iman Al-Onaizi^a Fatma Al-Awadi^a Abdul-Latif Al-Dawood^b

Departments of ^aPaediatrics and ^bSurgery, Al-Sabah Hospital, Kuwait

Key Words

Meckel's diverticulum · Haemorrhage · Iron deficiency anaemia · Abdominal pain

Abstract

Objectives: To describe a case of Meckel's diverticulum with an unusual complication of iron deficiency anaemia due to chronic intestinal bleeding. **Clinical Presentation and Intervention:** A 12-year-old boy presented with bloody diarrhoea and abdominal pain in association with a long-standing history of black stools and progressive pallor. Biochemical tests revealed low serum iron (1.2 mmol/l) indicating iron deficiency anaemia and low serum albumin (29 g/l). The other tests were normal. Colonoscopy performed on the 8th day of hospitalization was normal. A technetium-99m pertechnetate scan showed an ectopic gastric mucosa in the Meckel's diverticulum confirmed at surgery in the region of the antimesenteric border and on histopathology. **Conclusion:** Findings indicated that the patient had a bleeding Meckel's diverticulum, complicated by iron deficiency anaemia.

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Introduction

Meckel's diverticulum occurs in about 2% of the population, making it the most prevalent congenital abnormality of the gastrointestinal tract. Nevertheless, it is mostly asymptomatic as only 4–6% of patients develop symptoms [1]. Haemorrhage is the most common complication of Meckel's diverticulum in children. Although profuse acute bright rectal bleeding is common [2, 3], chronic bleeding is uncommon. We present a case of Meckel's diverticulum with iron deficiency anaemia due to chronic intestinal bleeding.

Case Report

A 12-year-old boy was admitted to the hospital with a 1-week history of diarrhoea associated with streaks of fresh blood and suprapubic abdominal pain. His past history disclosed the presence of recurrent abdominal pain of 1-year duration as well as passage of loose black stools (melaena). During the 2 months preceding his admission, he had complained of increased fatigue and was noted to be progressively pale. His diet was adequate and there was no history of recurring fever, weight loss, skin rash, mouth ulcers or joint complaints.

Initial examination showed a pale boy with no symptoms of toxicity. His weight and height were 34 kg (10th–25th percentile) and 152 cm (just above 50th percentile), respectively. He was afebrile with a heart rate of 102/min and blood pressure of 100/70 mm Hg. He had no clubbing or skin rash. Chest, heart and abdominal examinations were normal. Rectal examination did not reveal any polyp or fissure.

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1011–7571/02/0114–0214\$18.50/0

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Al-Awadi Fatma
PO Box 25263
13113 Safat (Kuwait)
Tel. +965 988 8020 or +965 481 2634, Fax +965 483 2154
E-Mail dr_falawadi@hotmail.com

Investigations revealed a Hb of 67 g/l, Hct 57 g/dl, MCV 73.6 fl, MCH 23.7 pg and MCHC 32 g/dl. WBCs were $3.5 \times 10^9/l$, platelets $255 \times 10^9/l$ and ESR 2 mm. Serum iron was 1.2 $\mu\text{mol/l}$ (reference range 6–27), transferrin 2.7 g/l (reference range 2.1–3.6) and saturation 2% (reference range 20–40). Prothrombin time was 12.9 s (control 10.5 s), and partial thromboplastin time was 24.5 s (control 23.5 s). His serum albumin was low (29 g/l). All other tests were normal: total bilirubin 3 $\mu\text{mol/l}$, alkaline phosphatase 263 U/l, alanine transaminase 23 U/l, adjusted serum calcium 2.47 mmol/l, phosphorus 1.3 mmol/l, creatinine 46 $\mu\text{mol/l}$, urea 3.8 mmol/l, blood glucose 5.4 mmol/l, serum sodium 140 mmol/l and serum potassium 4.5 mmol/l. Stool analysis revealed elevated RBCs. No ova or parasites were seen and stool culture showed no growth.

While in the hospital, he passed moderate amounts of fresh blood in stools on 2 occasions, and his Hb dropped to 50 g/l (normal range 120–140 g/l). He continued to have minimal rectal bleeding and required three blood transfusions.

Colonoscopy performed on the 8th day of hospitalization was normal. Meckel's diverticulum scan performed with technetium-99m ($^{99\text{m}}\text{Tc}$) pertechnetate showed a focal area of radioactive tracer accumulation in the lower abdomen just above the urinary bladder, which did not move during the study time (1.5 h). The above findings were suggestive of ectopic gastric mucosa (fig. 1).

Subsequently, laparoscopy was performed by introducing a laparoscope in through a 5-mm port. The Meckel's diverticulum was clearly identified at the usual site of ileum. It was a pouch of 2 cm in base and 3 cm in height at the antimesenteric border (fig. 2). No other abdominal lesion was identified. The diverticulum was removed by wedge resection. The histopathology confirmed Meckel's diverticulum with gastric mucosa (fig. 3). There was no evidence of *Helicobacter pylori*. The patient had an uneventful recovery and has since maintained normal albumin and haemoglobin levels without the need for iron therapy.

Discussion

The clinical presentation of Meckel's diverticulum is usually caused by a complication such as rectal bleeding, intestinal obstruction, intussusception, acute inflammation or perforation. Chronic bleeding from Meckel's diverticulum is uncommon. Few cases have been reported in adults [4, 5] and 1 case in children [6], the latter in association with partial intestinal obstruction. There are various explanations for the bleeding of Meckel's diverticulum. First it may contain ectopic gastric mucosa with acid production and subsequent ulceration of the adjacent ileum. Furthermore, recurrent intussusception may cause trauma, inflammation, mucosal erosion and bleeding. Finally, an inverted Meckel's diverticulum with repeated intraluminal mechanical trauma can lead to mucosal irritation and chronic blood loss. The pathogenic role of *H. pylori* in the development of gastritis in the ectopic tissue is disputable, considering the fact that these bacteria, although resistant to gastric acid, are not resistant to bile [7].

Fig. 1. Meckel's scan showing a focal area of tracer accumulation in the lower abdomen just above the urinary bladder.

Fig. 2. Intraoperative photograph showing Meckel's diverticulum at the usual site of the ileum.

The cause of bleeding in our patient was ectopic gastric mucosa in the Meckel's diverticulum as identified by a $^{99\text{m}}\text{Tc}$ pertechnetate scan (fig. 1) and confirmed by surgery and on pathology (fig. 3). Other complications such as an associated intussusception or obstruction that could have contributed to the bleeding were excluded surgically. Additionally, there was no evidence of *H. pylori*. The

Fig. 3. Histopathological slide showing the ectopic gastric mucosa in Meckel's diverticulum.

intestinal bleeding in our patient was chronic and recurrent as evidenced by the long-standing history of recurrent dark stools (melaena) and the presence of iron deficiency anaemia on admission. Had the bleeding been only an acute event, the anaemia would have been one of acute blood loss with normal red cell indices and not hypochromic microcytic with low serum iron. He had a history of good appetite, and his diet was verified to be adequate and balanced and therefore the possibility of an iron-deficient diet, as a cause of his anaemia, can be reasonably excluded.

An interesting point is that though bleeding in Meckel's diverticulum is said to be painless, it can be associated with abdominal pain in children. Such was the case with our patient, whose pain was caused by diverticulitis due to the ectopic gastric mucosa. It is worth mentioning that the pain in Meckel's diverticulum could be due to other causes such as obstruction, volvulus, intussusception and perforation [3, 8]. Initially, the presence of recurrent abdominal pain, hypoalbuminaemia and iron deficiency anaemia suggested the possibility of an inflammatory bowel disease. However, the patient showed no evidence of toxicity and had normal growth. The normal colonoscopy ruled out inflammatory bowel disease of the large bowel. Meckel's diverticulum is thought to occur much more often in association with Crohn's disease [9]. Endoscopy was not performed on our patient so we could not exclude Crohn's disease involving the small bowel. However, after surgical removal of the diverticulum and on

further follow-up, the abdominal pain, anaemia and hypoalbuminaemia resolved, making it unlikely that Crohn's disease was the aetiological factor for these symptoms.

Iron deficiency anaemia is not the only anaemia associated with Meckel's diverticulum. Megaloblastic anaemia caused by bacterial overgrowth and vitamin B₁₂ deficiency as a result of dilatation and stasis in the adjacent obstructed ileal loop has also been reported [10]. Although chronic anaemia is an uncommon complication of Meckel's diverticulum, it could still be a prominent presentation. We urge increased awareness and strongly suggest that Meckel's diverticulum should be considered in the differential diagnosis of iron deficiency anaemia with or without obvious gastrointestinal bleeding if other more common causes have been ruled out.

In cases of diagnosed non-operated Meckel's diverticulum, we advise parents to be on the watch for any changes in stool colour. Caregivers need to do rectal examination and stool should be examined for gross and occult blood during follow-up for the possibility of chronic blood loss, which can occur at any time.

Conclusion

Our findings indicated that the patient had a chronic bleeding Meckel's diverticulum complicated by iron deficiency anemia.

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