On-line Case Report

The trouble with investigating anaemia in young adults: bleeding from a giant Meckel's diverticulum without ectopic gastric mucosa

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ABSTRACT

Giant Meckel's diverticulum is rare and usually presents in childhood with haemorrhage or bowel obstruction. Bleeding results from the presence of ectopic gastric mucosa causing peptic ulceration of adjacent mucosa. We discuss the case of a 21-year-old man with a giant Meckel's diverticulum who presented with rectal bleeding. A Meckel's scan was negative and histology following surgical excision ruled out the presence of ectopic gastric mucosa. There was however evidence of chronic inflammation and small bowel mucosal ulceration. We hypothesize that this arose from ischaemia and pressure necrosis because of the large size of the diverticulum and chronic distension by food debris. This case highlights the difficulties in investigating anaemia in young adults despite modern imaging techniques.

Keywords: Giant Meckel's diverticulum – Rectal bleeding – Anaemia – Young adults

Case report

A 21-year-old man collapsed with anaemia (haemoglobin < 6 g/dl). He underwent immediate oesophagogastroduodenoscopy and colonoscopy which were both normal. The bleeding stopped spontaneously and, following a blood transfusion, he made a rapid recovery. His repeat blood tests showed a haemoglobin of 11.6 g/dl, mean corpuscular volume (MCV) 74 fl, platelet count $398 \times 10^9/l$, ferritin 37 ng/ml and normal clotting. A barium study demonstrated a large saccular viscus in the pelvis containing food debris but it was not possible to determine whether these areas were diverticula or saccular parts of the bowel. A computed tomography (CT) scan of the abdomen revealed a large gas and debris-filled structure in the pelvis.

Again, it was not possible to determine from which loop of bowel it arose but there was the suggestion of a vitelline artery supplying it. An isotope Meckel's scan using 99m-technetium pertechnate was performed and this showed normal uptake by the gastric mucosa and normal passage of tracer distally from the stomach. However, there was no uptake seen in right iliac fossa to suggest a Meckel's diverticulum. The area that corresponded to the abnormal viscus was represented by a photopaenic area with no isotope activity within it.

Soon after, he was admitted to hospital as an emergency with massive rectal haemorrhage. He underwent laparotomy when a giant Meckel's diverticulum was found. The middle of the diverticulum measured 8 cm in diameter and, on slicing, revealed the presence of a large blood clot

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within the lumen. The histology of the specimen confirmed the presence of inflamed, congested, small bowel mucosa with focal ulceration within the diverticulum.

He made an uncomplicated recovery and was discharged from hospital 5 days following surgery; he was discharged from out-patient follow-up 6 weeks later.

Discussion

Meckel's diverticulum is the most common congenital abnormality of the small intestine and results from the incomplete obliteration of the vitelline duct. Of cases, 80% are asymptomatic and the life-time risk of developing a complication is 6.4% with complications classically presenting in males in under the age of 2 years.¹

Embryology

The vitelline duct connects the fetal midgut to the yolk sac and disappears by the seventh gestational week. A range of duct anomalies result from the failure of complete duct obliteration. These contain all layers of bowel wall and are classified as true diverticula. They usually arise from the antimesenteric border of the ileum two feet proximal to the ileocaecal valve and 50% contain heterotopic mucosa which is most likely to be gastric in origin (90%). A right vitelline artery sometimes supplies the diverticulum.

Giant Meckel's diverticulum

Less than 0.5% of vitelline anomalies can be classified formally as a giant Meckel's diverticulum.² They are further classified into type 1 elongated and type 2 ovoid (> 6 cm in diameter). Some authors reserve the term 'giant' for type 2 diverticula.³

Giant Meckel's diverticulum presents most commonly with obstruction (volvulus, intussusception or internal herniation in neonates or mass effect and adhesions in adults).⁴ A type 1 giant Meckel's diverticulum can cause obstruction by wrapping around the small bowel.⁵ Bleeding is a less common complication and arises from ectopic gastric mucosa causing ulceration of neighbouring mucosa. This is usually painless and must be excluded in a child who presents with painless rectal bleeding.

Other complications include perforation, inflammation (mimicking appendicitis) and umbilical abnormalities (10%), which include recurrent peri-umbilical infection, chronic sinuses and abdominal wall abscesses. Rarely, neoplastic change may take place (4–5%).

Investigations

In a Meckel's scan, 99m-technetium-labelled pertechnetate is taken up by the ectopic gastric mucosa within the giant Meckel's diverticulum. However, with only 50% of Meckel's diverticula containing ectopic mucosa, the false negative rate is high. This investigation is performed in children as it is non-invasive and involves less radiation exposure than barium studies or CT.

A traditional small-bowel series has been found to be unreliable and some authors advocate enteroclysis for higher yield. Radiological signs include the triradiate fold pattern, mucosal triangular plateau and gastric rugal pattern. Despite frequently being requested, a CT scan is not helpful.

Selective arteriography can be useful during active bleeding but a rate of bleeding greater than 1 ml/min is required. The arteriogram may demonstrate abnormal arterial branches, dense capillary staining, or extravasation of the contrast medium.

Management

In symptomatic cases, the generally accepted course of management is resection and primary anastomosis, this being done increasingly by laparoscopy. The management of incidental and asymptomatic diverticula is controversial. Potential complications from surgery are relatively high (1–8%) and the life-time risk of complications is low. Higher risk categories include men under the age of 40 years with a diverticulum over 2 cm in diameter, which is suspected to contain heterotopic tissue. Patients with mesodiverticular or omphalodiverticular bands and thin-walled diverticula are also more likely to develop complications.

Conclusions

This case highlights the difficulties in investigating anaemia in young adults despite the availability of modern imaging techniques. In this case, the lack of ectopic gastric mucosa resulted in a negative Meckel's scan and delayed the diagnosis further. There are no cases in the literature that report bleeding from a Meckel's diverticulum without ectopic gastric mucosa. The large size of the diverticulum and chronic distension from food debris may have resulted in ischaemia, pressure necrosis and chronic inflammation and bleeding from ulceration of the mucosa within the diverticulum.

References

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