CASE REPORT

A microscopically calcified Meckel's diverticulum: a histopathological perspective of a case of both gastric and pancreatic mucosae

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SUMMARY

A 2-year-old child presented with a 1-week history of abdominal pain and non-bilious vomiting. Upon examination, the abdomen was distended and faecal aspirate was noted from a nasogastric tube. Ultrasound scan and a failed air enema demonstrated intestinal intussusception warranting a surgical intervention. The intraoperative findings were of an ileocolic intussusception that was reduced and a Meckel's diverticulum (MD) was noted as a lead point necessitating resection with an end-to-end anastomosis. Histopathological analysis revealed a heterotopic MD containing both gastric and pancreatic mucosae with dystrophic calcification. MD is a pathologically diverse condition. The commonest histopathological picture in MD is that of an ectopic gastric mucosa at the terminal ileum. The histopathological analysis of this case demonstrated the interesting heterotopic results with calcification, which the histopathologist needs to be aware of when interpreting a surgical specimen with a clinical picture consistent with intussusception.

BACKGROUND

Meckel's diverticulum (MD) is a known disease entity both from a clinical and pathological perspective. The commonest histological microscopic finding in MD is that of an ectopic gastric mucosa (60–82%). However, the presence of ectopic pancreatic tissue is reported in the literature in the range 1–16%, and the presence of both mucosae being 5–12% mainly in adult cases.¹ In this report, we describe a case of MD that included both mucosae with calcification presenting with the clinical features of intussusception. A review of MD histological features is subsequently discussed to highlight to the paediatric histopathologist that analysis of surgical specimens in the context of intestinal intussusception may reveal a possible heterotopic MD mucosae with an element of dystrophic calcification.

CASE PRESENTATION

A 2-year-old boy was admitted with a 1-week history of non-bilious vomiting who subsequently developed abdominal pain on eating, as well as anorexia and irritability. The child's last bowel opening was 5 days prior to admission. Upon examination, the abdomen was soft, non-tender but distended. Upon insertion of a nasogastric tube a faecal aspirate was noted.

INVESTIGATIONS

Radiological investigation in the form of a plain abdominal radiograph initially revealed dilated loops of bowel. Subsequent ultrasound scan of the abdomen revealed an intussusception. A failed air enema (figure 1) warranted a surgical intervention in the form of a laparotomy.

DIFFERENTIAL DIAGNOSIS

Differential diagnoses included bowel obstruction and intestinal intussusception.

TREATMENT

The treatment was surgical. The intraoperative surgical findings were of an ileocolic intussusception and an MD as a lead point. Open reduction of the intussusception was performed with a resection of the diverticulum and the involved terminal ileum with an end-to-end anastomosis.

OUTCOME AND FOLLOW-UP

The child made an uneventful postoperative recovery and was well upon a follow-up 8 months after the operation.

Histological analysis of the specimen revealed active inflammation with the presence of a nodule of pancreatic tissue, including islets of Langerhans within the mesentery at the point of the intussuscepted bowel (figures 2 and 3). As expected, inflamed gastric-type mucosa within the intussuscepted bowel was also demonstrated (figure 4).

DISCUSSION

During early fetal life the yolk sac is connected to the intestinal tract by the omphalomesenteric duct.²

Figure 1 Air enema demonstrating intussusception at the level of terminal ileum.

To cite: Al-lami A, Alam M, Nagy A, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008289

Figure 2 Pancreatic tissue in the small bowel wall comprising acini, islets of Langerhans and dilated pancreatic ducts at the level of the leading point (×40, H&E).

Failure of the normal obliteration of this structure by week five to seven of gestation leads to several anomalies such as umbilical sinus, umbilical cyst, omphalomesenteric fistula or MD.²

MD is one of the most common congenital anomalies of the gastrointestinal tract with an incidence of 1–3% from autopsy studies in the general population.³ The incidence is higher in males than females. MD is a true diverticulum consisting of all layers of the intestinal wall.² They sometimes contain ectopic mucosa most often gastric but occasionally pancreatic, duodenal or colonic.⁴ The overall presence of ectopic mucosa in MD varies from 15% to 50%.⁵

In general, the most common presentation of MD is that of abdominal obstruction, constituting symptoms of abdominal pain, nausea and vomiting. In one study a total of 19 of 164 MD cases were secondary to intestinal intussusception.¹ Bleeding from ulcerated acid-producing ectopic gastric mucosa is another common presentation of MD.⁶

In children, case reports have suggested that the presence of heterotopic pancreatic mucosa within the MD has a strong correlation with intussusception.⁷ In a recent case series, Maazoun *et al*⁸ reported three cases of heterotopic pancreatic tissue being present in a total of 27 children with secondary intussusception. The presence of heterotopic pancreatic tissue in

Figure 3 Pancreatic tissue in the small bowel wall comprising acini, islets of Langerhans and dilated pancreatic ducts at the level of the leading point (×100, H&E).

Figure 4 Leading point on the left side of the telescoped intestine with extensive erosion of the surface epithelium associated with secondary inflammatory and reactive changes (×40, H&E). Overlying ulcer slough contains dystrophic calcification along with congestion and granulation tissue formation in the underlying lamina propria. Opposite to the leading point (on the right side) a mildly inflamed small bowel mucosa is seen.

MD is an uncommon finding, while the presence of a calcified MD is a rare entity.⁹ This case report describes a rarely reported finding in the literature of a calcified paediatric MD involving both inflamed heterotopic pancreatic as well as gastric mucosa presenting as intussusception.⁹ Calcification of MD, first reported by Van Landingham and Symmonds¹⁰ in a child aged 15 years, is a rare event; Clement *et al*⁹ described an adult case of a calcified MD.

The presence of heterotopic pancreatic mucosa in MD has been reported to be associated with other pathologies. A case report of an MD involving heterotopic pancreatic tissue was found to be associated with carcinoid tumour.¹¹ More aggressive malignant changes, including adenocarcinoma, have been reported with heterotopic pancreatic tissue.¹² In a review of the topic, Uppal *et al*⁶ explained that MD complicated by bleeding is mostly associated with the presence of both gastric and pancreatic ectopic tissue. Bleeding in MD is thought to be chiefly owing to mucosal ulceration from an acid-secreting gastric mucosa adjacent to an alkaline-secreting heterotopic pancreatic tissue. A recent case report, however, describes a child with a purely pancreatic mucosa containing MD who presented with an obscure and then a massive gastrointestinal haemorrhage.⁷

With regard to the management of intussusception in children, it is widely accepted in the literature to attempt reduction enema therapy in the first 24 h in stable children with sonographically proven diagnosis.¹³ However, one might hypothesise that a radiologically reduced intussusception might potentially miss an MD that may be associated with, or potentially undergo, a neoplastic change of the heterotopic tissue in the future. Thus far, all the reported cases of the small bowel intussusception involving heterotopic pancreatic tissue, as in our case, have had an unsuccessful air enema necessitating a surgical intervention, be it by the laparoscopic or open laparotomy approach.¹³

In summary, we report a case of MD in which histopathological analysis demonstrated the anomaly of containing both heterotopic gastric and pancreatic mucosa with calcification. The paediatric pathologist needs to be aware of this histopathological picture when interpreting a suspected MD presenting specifically as intussusception.

Learning points

- ▶ The existence of potentially more than one ectopic mucosa in Meckel's diverticulum (MD) with potential complications including neoplastic changes and bleeding.
- ▶ Detailed histopathological analysis in the context of intussusception to unveil a possible MD with heterotopic mucosae with an element of dystrophic calcification.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 St-Vil D, Brandt ML, Panic S, *et al.* Meckel's diverticulum in children: a 20-year review. *J Pediatr Surg* 1991;26:1289–92.
- 2 Blevrakis E, Partalis N, Seremeti C, *et al.* Meckel's diverticulum in paediatric practice on Crete (Greece): a 10-year review. *Afr J Paediatr Surg* 2011;8:279–82.
- 3 Kopacova M, Vykouri L, Vacek Z, *et al.* Inverted Meckel's diverticulum with ectopic pancreatic tissue as a source of severe gastrointestinal bleeding. *J Gastrointest Surg* 2010;14:578–81.
- 4 Sharma RK, Jain VK. Emergency surgery for Meckel's diverticulum. *World J Emerg Surg* 2008;3:1–8.
- 5 Thurley PD, Halliday KE, Somers GM, *et al.* Radiological features of Meckel's diverticulum and its complications. *Clin Radiol* 2009;64:109–18.
- 6 Uppal K, Tubbs RS, Matusz P, *et al.* Meckel's diverticulum: a review. *Clin Anat* 2011;24:416–22.
- 7 Xiao WD, Chen W, Yang H. Heterotopic pancreas within Meckel's diverticulum with obscure then massive gastrointestinal bleeding in a 12-year-old child: case report and review of the literature. *J Int Med Res* 2009;37:967–72.
- 8 Maazoun K, Mekki M, Sahnoun L, *et al.* Intussusception owing to pathologic lead points in children: report of 27 cases. *Arch Pediatr* 2007;14:4–9.
- 9 Clemente G, Ionta R, Sarno G, *et al.* Calcified Meckel's diverticulum: an unusual incidental finding during laparoscopy. *Am J Surg* 2007;193:482–3.
- 10 Van Landingham SB, Symmonds RE. Calcification of Meckel's diverticulum. *Arch Surg* 1982;117:248.
- 11 Scognamiglio F, Panico L, Petrillo O, *et al.* Carcinoid associated with pancreatic heterotopia in Meckel's diverticulum. The clinical, morphological and ultrastructural aspects of a case. *Minerva Chir* 1990;45:1043–7.
- 12 Lai CS, Ludemann R, Devitt PG, *et al.* Images of the month. Heterotopic pancreas. *Arch Surg* 2005;140:515–16.
- 13 Seifarth FG, Ryan ML, Triana J, *et al.* Diagnosis and laparoscopic treatment of ileoileal intussusception secondary to heterotopic pancreas in an infant: case report and review of the literature. *J Pediatr Surg* 2011;46:E33–6.

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