A Pictorial Review of Complications of Meckel's Diverticulum in Adults

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Background and Purpose

Meckel's diverticulum (MD) is the commonest congenital GI tract anomaly, affects approximately 2% of the population and occurs due to incomplete resorption of the embryonic vitellointestinal duct. Its complications often mimic other abdominal pathologies, making diagnosis challenging [1].

This case series highlights MD as an under-recognised cause of acute abdomen in adults. We retrospectively reviewed 7 cases (2018 – 2024), comprising 2 females and 5 males (mean age 45, range 26 – 66 years). We analysed imaging findings, operative notes and histopathology.

Case 1: 42-year-old female


Figure 1 - axial

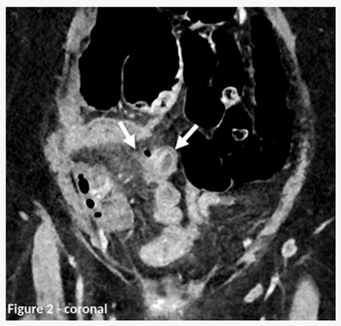
Figure 2 - coronal

- Contrast enhanced CT: an **inflamed perforated Meckel's diverticulum** arising from the distal ileum.
- Histology: MD with **gastric heterotopia** and perforation.
- **Learning point: heterotopic gastric mucosa secretes hydrochloric acid and results in ulceration, inflammation, and perforation of MD.**

Case 2: 26-year-old male

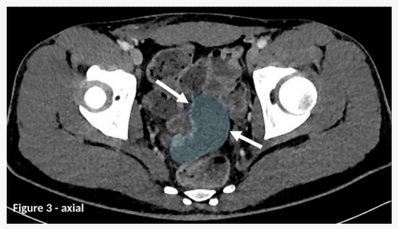
Figure 3 - axial

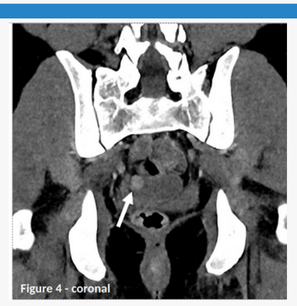
Figure 4 - coronal

- Contrast enhanced CT: **prominent blind-ended bowel segment** arising from distal ileum, containing a **solid mural nodule.**
- Histology: MD with mucosal ulceration and **ectopic pancreatic tissue.**
- **Learning point: exocrine secretions from heterotopic mucosa within MD can erode vitellointestinal artery, leading to GI bleed.**

Case 3: 51-year-old female

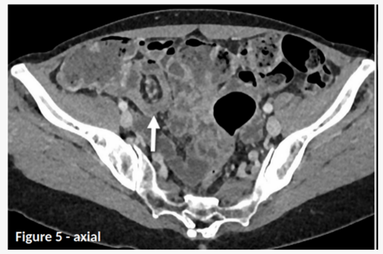
Figure 5 - axial

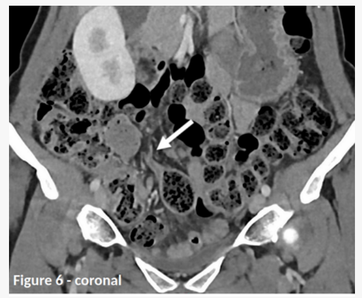
Figure 6 - coronal

- Contrast enhanced CT: twisting of the terminal ileum around a **fatty band adhesion**, causing upstream small bowel obstruction (SBO).
- Intra-operatively: the lead point for ileal volvulus was the associated **vitellointestinal duct remnant**.
- **Learning point: if the vitellointestinal duct fails to involute during gestation, it can lead to vitellointestinal anomalies, including MD.**

Case 4: 66-year-old male

- Contrast enhanced CT: hyperenhancing **heterotopic pancreatic tissue** at the apex of an MD.
- **Learning point: on imaging MD can mimic other pathologies, such as neuroendocrine tumour, GIST or serosal metastasis.**


Figure 7 - sagittal

Case 5: 57-year-old male

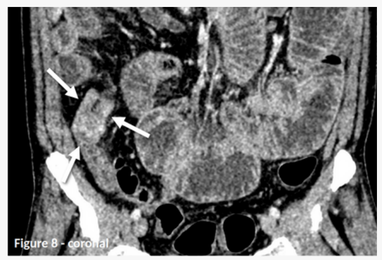
Figure 8 - coronal

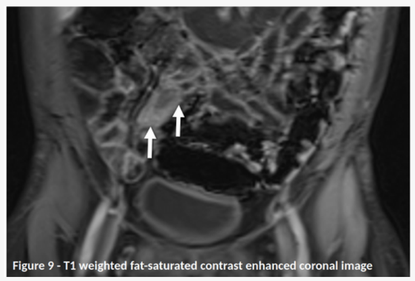
Figure 9 - T1 weighted fat-saturated contrast enhanced coronal image

- Contrast enhanced CT and MRI: enhancing lesion within a distal ileal MD was lead point for ileo-ileal intussusception and upstream SBO.
- Histology: MD containing **well differentiated neuroendocrine tumour.**
- **Learning point: malignancies can develop inside MD with NET being the commonest, followed by adenocarcinoma and GIST [2].**

Case 6: 47-year-old male

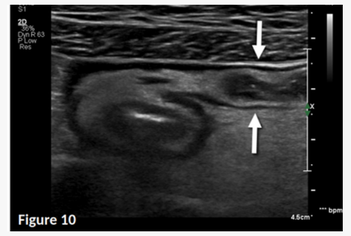
Figure 10


Figure 11 - coronal

- Ultrasound and contrast enhanced CT: acute on chronic Crohn's disease affecting distal ileum and MD (arrowed).
- **Learning point: prevalence of MD is 3x higher in Crohn's disease [3] and this case illustrates how Meckel's diverticulitis can be caused by Crohn's mediated inflammation.**

Case 7: 26-year-old male

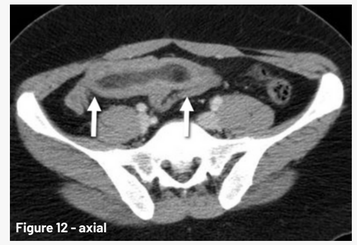
Figure 12 - axial

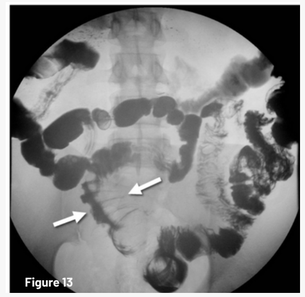
Figure 13

- Barium and contrast enhanced CT: inverted and intussuscepted MD
- **Learning point: when MD inverts, the accompanying mesentery invaginates into it, giving rise to central fat sign on CT (arrowed).**

Conclusions

Our case series demonstrates diverse Meckel's diverticulum complications in adults, including:

- **Infective/Inflammatory:** Perforated Meckel's diverticulitis
- **Vascular:** Acute haemorrhage from the vitellointestinal artery
- **Mechanical:** Intussusception causing bowel obstruction/ volvulus
- **Autoimmune:** Crohn's induced Meckel's diverticulitis
- **Neoplastic:** Neuroendocrine tumour within Meckel's diverticulum

MD is important to consider in adults with acute abdomen.

References

[1] Chatterjee, Argha, et al. 'Reminiscing on Remnants: Imaging of Meckel Diverticulum and Its Complications in Adults'. *American Journal of Roentgenology*, vol. 209, no. 5, Nov. 2017, pp. W287–96. DOI.org (Crossref), https://doi.org/10.2214/AJR.17.18088.

[2] Mora-Guzmán, I., et al. 'Neuroendocrine Tumours within a Meckel's Diverticulum'. *The Annals of The Royal College of Surgeons of England*, vol. 100, no. 1, Jan. 2018, pp. e10–11. *DOI.org (Crossref)*, https://doi.org/10.1308/rcsann.2017.0180.

[3] Kassim, Thamer, et al. 'Meckel's Diverticulum in Crohn's Disease Revisited: A Case of Meckel's Diverticulitis in a Patient with Stricturing Crohn's Disease'. *Cureus*, June 2018. *DOI.org (Crossref)*, https://doi.org/10.7759/cureus.2865.