

Early Appendicitis – A Safe Diagnosis?

DL Loh,¹FAMS (Paed surg), MBChB, FRCS (Paed), FD Munro,²MBChB, FRCS (Edin), FRCS (Paed), D Wilson-Storey,²MBChB, MD, FRCS (Edin), JD Orr,²MBChB, MBA, FRCS (Edin)

Abstract

Introduction: Serosal inflammation of the appendix in association with a significant peritoneal exudate can be mistaken for early acute appendicitis. We highlight the importance of looking for other sources of intra-abdominal sepsis in this clinical setting. **Clinical Picture:** We present 3 cases of so-called ‘mild’ appendicitis with serosal inflammation that was ultimately shown to be caused by Meckel’s diverticulitis. **Treatment:** All 3 patients initially underwent an appendicectomy. In 2 of these cases, a further laparotomy and excision of a Meckel’s diverticulum was carried out. All 3 made an uneventful recovery. **Conclusion:** Meckel’s diverticulitis can mimic acute appendicitis in clinical history, physical findings and operative findings. It is important to always consider this as a possible cause for an acute abdomen.

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Introduction

Appendicitis is the most common surgical condition of the abdomen.¹ At laparotomy, an inflamed appendix is removed once it is found, and further exploration of the peritoneal cavity is not advised. If, however, the appendix is found to be normal, exploration is essential to exclude other inflammatory causes of abdominal pain. Mild inflammation of the appendix, in the presence of a significant peritoneal exudate but in the absence of perforation or gangrene, should be a cause for concern and an indication for further exploration. We would like to highlight 3 cases of so-called ‘mild’ appendicitis with serosal inflammation that was ultimately caused by Meckel’s diverticulitis.

Case Reports

Case 1

A 2-year-old boy was admitted with a 24-hour history of vomiting and right-sided abdominal pain. On examination, he was tender in the right iliac fossa with mild guarding. Routine bloods were taken and the white cell count was raised at $31.9 \times 10^9/L$ (80% neutrophils). He continued to have right-sided abdominal pain and therefore was taken to theatre. At laparotomy, a congested appendix and moderate amounts of turbid peritoneal fluid was found. A routine appendicectomy was carried out.

Postoperatively, he continued to have abdominal distension. An abdominal x-ray and ultrasound scan showed a heterogeneous fluid collection in the right subphrenic area with an air-fluid level. This was thought to be possibly a subphrenic abscess, although the radiologist felt that the wall of the collection was quite thin and not consistent with an abscess. He was taken back to theatre and at laparotomy, a tortuous giant cystic Meckel’s diverticulum was found in the subhepatic space (Fig. 1). This was excised and a primary anastomosis was carried out.

Histology of the appendix showed subserosal lymphatic dilatation and vascular congestion but no mucosal inflammation. The macroscopic report of the mass showed that it was 6.5 cm in diameter. Its external surface was smooth and on sectioning, the lumen of the mass/swelling was found to be in continuity with the lumen of the intestine. It was lined by necrotic debris and it was believed to have arisen from an ulcerated and extensively inflamed necrotic Meckel’s diverticulum.

Case 2

An 8-year-old boy presented with lower abdominal pain, which was sudden in onset. His abdominal examination revealed a tender right iliac fossa with some guarding. A full blood count showed he had a raised white cell count of $17.8 \times 10^9/L$ (88% neutrophils). A presumptive diagnosis

¹ Department of Paediatric Surgery
National University Hospital, Singapore

² Department of Paediatric Surgery
Royal Hospital for Sick Children, Edinburgh, UK

Address for Reprints: Dr DL Loh, Department of Paediatric Surgery, National University Hospital, 5 Lower Kent Ridge Road, Singapore 119074.
Email: LohDL@nuh.com.sg



Fig. 1. Giant cystic Meckel's diverticulum.

of appendicitis was made and he was taken to theatre. At laparotomy, a swollen appendix with an injected serosa, as well as a large amount of turbid peritoneal fluid, was found. A routine appendicectomy was carried out. Postoperatively, however, he continued to complain of abdominal pain. An ultrasound of his abdomen showed free fluid in his right iliac fossa and pelvis. On the 4th postoperative day, he became pyrexial and had generalised abdominal pain. His full blood count showed a fall in his haemoglobin from 12 g/dL to 8.3 g/dL. He was taken back to theatre and underwent a diagnostic laparoscopy, which found blood in the pelvis and the left iliac fossa. A complex mass in the right iliac fossa was also noted. A laparotomy was carried out via the previous Lanz incision. A perforated Meckel's diverticulum was found and this was resected and a primary anastomosis carried out. Postoperatively, he made an uneventful recovery.

Histology of the appendix showed marked serosal injection. Histology of the Meckel's diverticulum showed a perforated peptic ulcer.

Case 3

A 10-year-old boy presented with increasing irritability and right-sided abdominal pain. On examination, the right side of his abdomen was tender with no signs of guarding and rebound tenderness. Routine full blood count showed that he had a raised white cell count of $13.6 \times 10^9/L$ (91% neutrophils). His only significant past medical history was that he had a ventriculo-peritoneal shunt inserted for hydrocephalus. An abdominal ultrasound showed a moderate amount of free fluid in the pelvis with small bowel dilatation. He was taken to theatre with a presumptive diagnosis of appendicitis. At laparotomy, the appendix was found to be mildly oedematous and free intra-peritoneal fluid was present. However, on this occasion, the small bowel was examined and an inflamed Meckel's diverticulum with a necrotic tip was found. It was excised with a cuff of small bowel and a primary anastomosis was carried out. Postoperatively, he made an uneventful recovery and he was discharged 6 days later.

Histology of the appendix showed macroscopically serosal injection at the tip of the appendix. Histology of the Meckel's diverticulum showed it to be lined by mainly gastric-type mucosa with generalised inflammation and an associated perforation.

Discussion

The diagnosis of appendicitis at laparotomy is made on finding a red swollen, turgid appendix with or without purulent peritoneal free fluid. If an inflamed appendix is found, particularly if there is a localised collection of pus, then further exploration is generally not advised for fear of spreading infection throughout the peritoneal cavity.

In situations where the appendix is found to be 'lily-white' or not inflamed, it is often clear that the peritoneal cavity should be explored to exclude any other pathology. However, as these 3 cases have demonstrated, serosal inflammation of the appendix can be easily mistaken for early acute appendicitis. In all these cases, a significant amount of turbid intra-peritoneal fluid was found, more than one would expect for mild or early appendicitis.

In the first case, a tortured cystic Meckel's diverticulum was the cause of the inflammation. In the other 2 cases, a perforated peptic ulcer was found within the Meckel's diverticulum. Other possible causes of right iliac fossa pain are mesenteric adenitis, pyelonephritis, terminal ileitis, cholecystitis and salpingo-oophoritis. In 1985, Nordback and Matikainen² reported similar findings in a 37-year-old man who was eventually found to have a perforated Meckel's diverticulum.

With the widespread use of laparoscopy in today's surgical practice, its use in these particular cases may have enabled us to diagnose the Meckel's earlier. However, the operator would have had to be proficient in laparoscopic techniques to ensure that the whole small bowel was examined and that a Meckel's was not missed.

The extensive range of causes of a purulent peritoneal exudate and the need to explore further in the absence of a grossly inflamed appendix have long been recognised.³ We therefore would advise that all surgeons in training should be taught that if there is only minimal inflammation of the appendix and a significant amount of intra-peritoneal fluid, the abdomen should be thoroughly explored to exclude another focus of inflammation.

REFERENCES

- 1 Anderson KD, Parry RL. Appendicitis. In: O'Neil JA, Rowe MI, Grosfeld JL, Fonkalsrud EW, Coran AG, editors. *Paediatric Surgery*. 5th ed. St. Louis: Mosby-Year Book, 1998:1369-79.
- 2 Nordback I, Matikainen M. Secondary Appendicitis – A sign of some other intra-abdominal inflammation. *Ann Chir Gynaecol* 1985;74: 134-6.
- 3 Dudley HAF. Acute appendicitis. In: Dudley HAF, editor. *Hamilton Bailey Emergency Surgery*. 11th ed. Bristol: John Wright & Sons, 1967:336-45.