Appendicitis due to incarceration within a laparoscopic umbilical port-site hernia secondary to a degree of intestinal malrotation

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ABSTRACT

A 37-year-old woman presented with an incarcerated hernia at a previous umbilical laparoscopic port site. This was found to contain an ischaemic appendix, which was managed successfully with open appendicectomy and a mesh repair. Previous imaging from a year prior to these events demonstrated a degree of intestinal malrotation with the caecal pole lying just under the umbilicus. Finding the appendix within an incisional port site is very rare, for this to occur at the umbilicus is unique.

KEYWORDS

Umbilical port site – Incarcerated appendix – Malrotation

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Case history

A 37-year-old woman presented with a three-day history of sharp, upper abdominal pain associated with a one-day history of diarrhoea and vomiting. Her medical history included obesity, pancreatitis, chronic back pain, depression and laparoscopic sterilisation years previously. Bloods demonstrated an obstructive jaundice, a raised C-reactive protein of 279 mg/l and normal amylase levels. Abdominal ultrasound did not obtain useful views and magnetic resonance cholangiopancreatography (MRCP) demonstrated a 3-mm gallstone in the neck of the gallbladder, no intraductal calculi and some oedema in the fat surrounding the pancreas. She was therefore treated as gallstone pancreatitis and discharged after five days in hospital.

The patient re-presented 12 days after her previous discharge with an erythematous, incarcerated umbilical hernia arising from the umbilical port site from the previous laparoscopic sterilisation. She felt nauseous, but was not vomiting, and was passing flatus. Initial bloods demonstrated a falling CRP of 120 mg/l and normal amylase levels. Plain abdominal radiography showed no bowel obstruction, but sterilisation clips were noted in the pelvis (Fig 1). Contrast computed tomography (CT) demonstrated an incarcerated hernia with a 3-cm defect reported as containing small bowel, but without bowel obstruction. The pancreas did not demonstrate any abnormality (Fig 2). She underwent incisional hernia repair, when an ischaemic appendix was found within an inflamed hernial sac

necessitating appendicectomy (Fig 3). The 3-cm defect was repaired with an onlay prolene mesh secured with prolene sutures. A suction drain was placed over the mesh, adipose tissue was closed with vicryl, and clips were used for skin closure.

She developed a wound infection that was managed successfully with antibiotics. The drain was removed and she was discharged four days post-surgery. Histology on the excised appendix demonstrated no perforation, mucosal ulceration with transmural acute inflammation and prominent nerve bundles with muscularis propria hypertrophy. The appearances were consistent with chronic appendiceal incarceration.

Finding the ischaemic appendix was unexpected; however, retrospective analysis of historical imaging delineates the likely aetiology of this rare hernia. The patient was admitted one year previously with pancreatitis and, at that time, a CT was obtained (Fig 4). The same hernia is seen containing fat only, with the patient's caecum and ascending colon lying in a horizontal position inferior to the transverse colon. The appendix was seen in a left para-umbilical position. CT from her operative admission demonstrates the same abnormal position of the caecum (Fig 2B). The scout images from MRCP described above demonstrated bowel in the umbilical hernia at that time but this carried the radiological appearance of small bowel (Fig 5). During that admission, the patient did not complain of umbilical pain and on examination there was no hernia apparent within the subcutaneous fat.

Figure 1 Abdominal radiograph showing bilateral sterilisation clips in situ in the pelvis but no other significant abnormality.

This patient must have had a degree of intestinal malrotation resulting in her caecal pole lying just under the umbilicus, where a hernia developed following the insertion of a laparoscopic umbilical port for a gynaecological procedure. She developed a pancreatitis secondary to gall-stones and at that time small bowel was able to enter and exit the hernia. The appendix then became incarcerated

Figure 2 Computed tomography of the abdomen/pelvis with portal venous contrast. a) An oblique axial view obtained via multiplanar reconstruction shows inflammatory fat stranding within the umbilical hernia (A) which contains the appendix (B). The caecum (C) and terminal ileum (D) can be seen lying in a left para-umbilical position. b) An oblique sagittal view obtained via MPR shows the hepatic flexure (A) and transverse colon (B) lying above the caecum (C) and descending colon (D). Once again, the umbilical hernia (E) can be seen containing the appendix (F) with associated inflammatory fat stranding. The terminal ileum (G) can be seen posterior to the appendix.

Figure 3 Operative photograph of the appendix found within the umbilical port site hernia.

within the hernia resulting in appendiceal ischaemia and then appendicitis which caused her second presentation.

Discussion

Anterior abdominal wall hernias containing the appendix are rare and are usually due to sliding variants into the inguinal region or femoral canal on the right side. These are known eponymously as Amyand's or De Garengoet's

Figure 4 Computed tomography of the abdomen/pelvis with portal venous contrast. This axial slice from a computed tomograph one year prior to the patient's presentation with appendicitis shows the umbilical hernia (A) which at this time contained only fat. The ascending colon (B) lies in a transverse position in the abdomen, directly inferior to the transverse colon. The appendix (C) passes inferiorly from the caecum in a left para-umbilical position.

Figure 5 Sagittal scout image from magnetic resonance cholangiopancreatography. This shows a loop of small bowel within the umbilical hernia (A). The appendix could not be seen in any sequence of this imaging.

hernias, respectively. They are usually encountered incidentally during elective repairs, but may present with appendicitis.¹

Encountering the appendix in incisional hernias is less well reported and these hernias do not carry an eponymous name. The majority of reports are in open wounds nearer to the right iliac fossa such as a Pfannenstiel incisions.² They may, however, migrate further into upper abdominal wounds, such as an upper midline laparotomy for an open cholecystectomy.⁵

Incisional hernias at laparoscopic port sites are even more unusual, with only two cases found previously in the literature. The first was through a 5-mm port site in the

right iliac fossa five weeks following diagnostic laparoscopy and lavage for a sealed duodenal ulcer that presented with an incarcerated inflamed appendix.³ The second case was two years following a laparoscopic cholecystectomy where a drain was left through the right iliac fossa at the 5-mm port site.⁴ Both of these cases presented with acute appendicitis. It is likely that, because of a narrowed-neck defect, incarceration of the appendix is soon followed by ischaemia and appendicitis.

Intestinal malrotation is defined as deviation from the normal 270 degrees counter-clockwise rotation of the midgut. This phenomenon is usually only clinically significant in the paediatric population. In the majority of cases it does not cause any symptoms, only becoming apparent on CT or laparotomy in later life. The estimated frequency is approximately 1 in 500 births.⁵ The proportion of adult patients admitted under general surgeons with anomalous anatomy is likely to be underestimated.

Conclusion

It is possible for the appendix to become incarcerated within laparoscopic port-site incisional hernias. In the cases previously reported, 5-mm ports were probably placed on the anterior abdominal wall proximal to the caecal pole. In the case discussed, the port site was placed over a malrotated caecal pole, resulting in this unique occurrence. Surgeons should avoid placing laparoscopic port sites directly over the caecum if the appendix remains in place. If this is necessary, even 5-mm defects should be securely closed. Radiologists should report incidental malrotation seen on imaging, as it may inform future presentations.

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