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Inguinal herniae: Valuable clues to concurrent abdominal pathology

A series of case studies describing unusual findings in 'routine' hernia operations which demonstrate the need for thorough surgical training

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ABSTRACT

INTRODUCTION: The case series presented here demonstrates that the pathology encountered during inguinal hernia repair can often provide clues to concurrent pathology; the well trained surgeon's broader medical knowledge can lead to earlier diagnosis.

PRESENTATION OF CASES: The case series examines four cases of men presenting with inguinal hernias, who were found to have concurrent abdominal pathology after further investigation of the intraoperative findings of the surgeon.

DISCUSSION: Operating surgeons not only require the necessary surgical skills to deal with the unexpected, but must also rely on their ability to think laterally when interpreting atypical incidental findings during 'routine' procedures.

CONCLUSION: Experience and knowledge gained through a surgeon's career is essential to enable them to correctly interpret their intraoperative findings and potentially diagnose concurrent pathology. The authors believe that surgical care practitioners, trained in just 2 years, would lack these essential skills.

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1. Introduction

Pathology encountered during routine or emergency repair of abdominal herniae can provide the first clues to occult intra-abdominal pathology. Surgeons' attention to detail and experience can result in earlier diagnosis and treatment of conditions that would otherwise present at a more advanced stage with an associated poorer prognosis.

2. Cases

2.1. Case 1

An 88-year-old gentleman of Asian origin was admitted for an elective left inguinal hernia repair under general anaesthesia. Of note he had experienced gradual weight loss and decreased appetite over the previous year, for which he was undergoing outpatient investigation. There was no history of tuberculosis (TB), and with the exception of chronic constipation, there were no abdominal symptoms. Examination revealed a left inguinal hernia but was otherwise unremarkable, as were all pre-operative investigations.

Intra-operatively, an indirect peritoneal sac containing multiple, hard, yellow deposits of an unusual nature was identified and sent for histological analysis, and a routine Lichtenstein mesh repair was performed. Histology revealed granulomata (Fig. 1) and subsequent Ziehl–Neelsen staining was positive for *Mycobacterium tuberculosis*. There was no evidence of pulmonary TB. The diagnosis of abdominal TB was made and he was commenced on anti-tuberculosis quadruple therapy, making a full recovery.

2.2. Case 2

A 62-year-old gentleman presented with an acutely painful, tender, non-reducible swelling in his left inguinal region, which developed shortly after sexual intercourse. There was no history of prior herniae and past medical history included obesity and hypertension. Abdominal examination was unremarkable. The diagnosis of a strangulated inguinal hernia was made and he was taken to theatre immediately. Exploration revealed an indirect inguinal peritoneal sac containing haematoma extending to the deep ring. The sac was excised and a Lichtenstein mesh repair performed. The presumed cause of haematoma was direct trauma to the inguinal region prior to admission. An urgent post-operative computed tomography (CT) scan of the abdomen and pelvis was requested to investigate the source of intra-abdominal haemorrhage. However, before this could be performed, the patient developed a distended, tender abdomen, became haemodynamically unstable, and was

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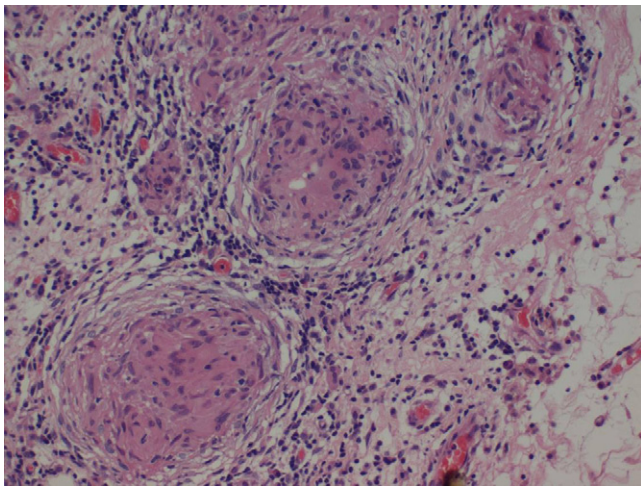


Fig. 1. Well circumscribed mature granulomata (non-necrotising) within the peritoneal connective tissues of the hernial sac. Note the multinucleate giant cells (black closed arrows) within central collections of epithelioid cells and the encircling rim of lymphocytes (Haematoxylin & Eosin $\times 400$ magnification).

taken to theatre without delay for a suspected ruptured abdominal aortic aneurysm (AAA). Laparotomy revealed a ruptured infra-renal AAA with free intra-peritoneal haemorrhage. This was repaired with a Dacron tube graft and the patient made a full recovery.

2.3. Case 3

A 60-year-old gentleman presented with an irreducible right inguinal hernia. Past medical history revealed only a 6-month history of diarrhoea awaiting investigation by his General Practitioner. Emergency exploration exposed an indirect hernial sac with multiple peritoneal seedlings suspicious of metastatic deposits; histopathology confirmed metastatic carcinoid. A detailed retrospective history revealed a short history of intermittent flushing and sweating. A post-operative CT scan of the abdomen revealed a suspicious calcified mass in the root of the mesentery of the terminal ileum closely apposed to the caecum (Fig. 2) with multiple peritoneal and hypervascular liver metastases. Colonoscopy confirmed a neoplastic mass in the caecum and biopsies confirmed a carcinoid primary tumour (Figs. 3 and 4). The patient underwent a palliative, debulking, right hemicolectomy and residual systemic

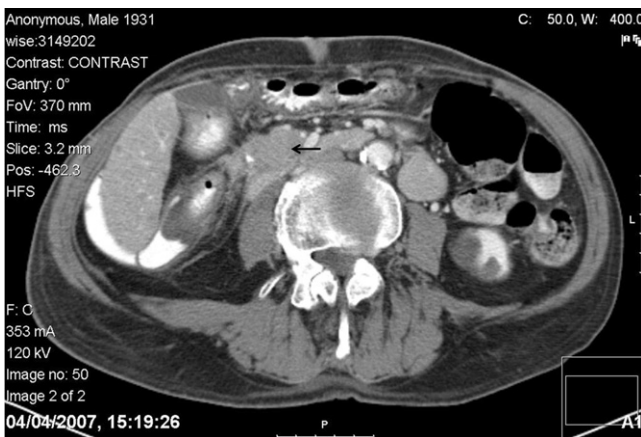


Fig. 2. CT abdomen demonstrating an irregular 4 \times 2 cm soft tissue mass within the root of the mesentery in the right iliac fossa closely apposed to the caecum (black closed arrow). The mass contains multiple flecks of coarse calcification and is surrounded by an intense desmoplastic response. These features are highly suggestive of a gastrointestinal neuroendocrine tumour.

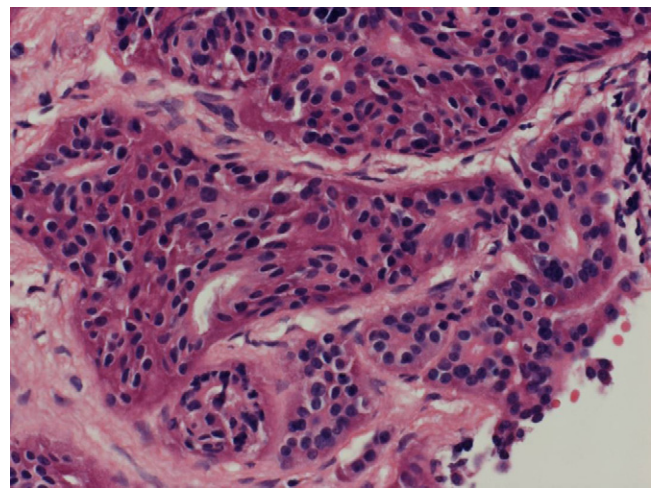


Fig. 3. Caecal biopsy demonstrating classical features of neuroendocrine neoplasia with compact nests of small uniform neoplastic cells and typical central nuclei displaying scanty mitotic activity, and abundant finely granular cytoplasm (Haematoxylin & Eosin $\times 400$ magnification).

symptoms were successfully alleviated with depot subcutaneous injections of Octreotide.

2.4. Case 4

An 80-year-old gentleman presented as an emergency with an irreducible inguino-scrotal hernia which was explored urgently. Past medical history revealed moderate alcohol intake and a 40-pack-year smoking history. On examination he had a mildly distended abdomen with no other obvious signs. Exploration revealed an indirect peritoneal sac containing a large amount of ascitic fluid (Fig. 5). The hernia was repaired routinely and abdominal ultrasound was requested to investigate the aetiology of the ascites, demonstrating a cirrhotic liver and a moderate volume ascites. The post-operative diagnosis of alcoholic liver disease was made, and he was managed as an out-patient by the gastroenterologists.

3. Discussion

The peritoneal sac of an indirect inguinal hernia is in free communication with the abdominal cavity, and is a direct extension of

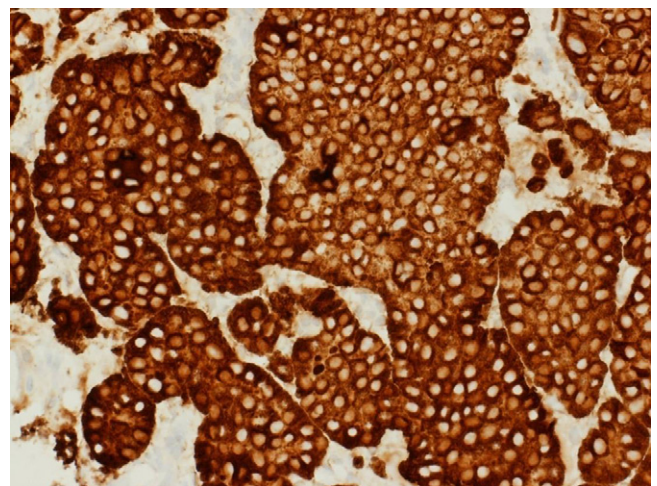


Fig. 4. Chromogranin A immunohistochemistry ($\times 400$ magnification) showing strong positivity within tumour cells which is suggestive of neuroendocrine differentiation.

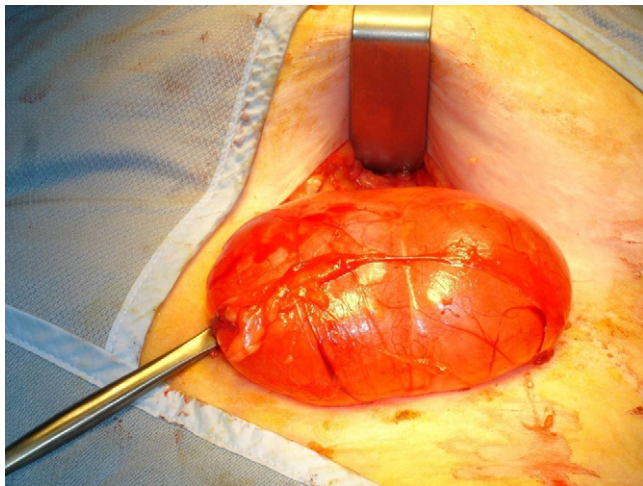


Fig. 5. Indirect inguinal peritoneal sac filled with ascitic fluid.

its parietal peritoneal lining. Therefore, it is not surprising that fluid, such as ascites and blood, can fill the dependent hernial sac, and that disease processes affecting the abdominal peritoneum can extend to involve the hernial sac also. Strangulation of an inguinal hernia is a common surgical emergency, and although detailed history and examination should be sought in every patient, rare symptoms and subtle signs may be missed during emergency preparation for theatre. As demonstrated, indirect inguinal herniae can often provide the first clues of concurrent abdominal co-pathology, which would have otherwise present at a more advanced stage.

Occasionally an acutely symptomatic inguinal hernia may lead to timely intervention with a significant reduction in morbidity and mortality, for instance with an AAA rupture masquerading as a symptomatic inguinal hernia, which is rare, but well described in the literature.^{1,2} However, the presence of blood/haematoma in the inguinal canal should alert the surgeon to the possibility of significant intra-abdominal haemorrhage and prompt investigation is required to avoid poor outcome.¹

In general, atypical tissues and fluid encountered during elective or emergency hernia repair should always be sent for histological and cytological evaluation. Failure to do so can result in late presentation of concurrent abdominal pathology. Abdominal TB, which comprises 11–16% of all cases of TB,³ may involve the intestine, peritoneum, mesenteric lymph nodes, or a combination of these entities. Definitive diagnosis can be difficult due to the non-specific symptoms and the low culture yield of *Mycobacterium*.^{4–6} Histopathological demonstration of tuberculous granulomata often plays a key role in making a final diagnosis.⁴

Peritoneal carcinomatosis has been described in approximately one third of patients with intestinal carcinoid^{7,8} and is usually associated with liver metastases. Although the presence of liver metastases renders resection of gastrointestinal carcinoids palliative, debulking of the tumour burden reduces the incidence of complications (bleeding, perforation and obstruction) and facilitates symptom alleviation with somatostatin analogues.⁹

4. Conclusion

Experience through surgical training shows that no two inguinal hernia repairs are identical. Operating surgeons not only require the necessary surgical skills to deal with the unexpected, but must also rely on their ability to think laterally when interpreting atypical incidental findings during 'routine' procedures. In 2005, the Department of Health published a national framework for the development of 'Surgical Care Practitioners', to help shorten waiting times for routine operations such as hernia repair.¹⁰ In our opinion, it is extremely unlikely that these practitioners would have the necessary skills to identify the 'abnormal', and act accordingly in the best interests of the patient, within their suggested training period of only two years.

Conflict of interest statement

No conflicts of interest to declare.

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Ethical approval

Consent was obtained from the patients prior to the publication of this case series.

Author contributions

Wilson JM, Duncan AN, Ignjatovic A involved in patient selection, and writing. Babu ED and Kelley CJ involved in patient selection.

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