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Transmesenteric hernia: A rare cause of bowel ischaemia in adults

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ABSTRACT

INTRODUCTION: Transmesenteric herniae are a rare cause of bowel ischaemia in adults with few reported cases in published literature.
PRESENTATION OF CASE: We report a rare case of a 26-year-old female with spontaneous transmesenteric hernia of jejunum and proximal ileum due to a congenital mesenteric defect resulting in bowel gangrene, presenting initially with no haemodynamic or biochemical abnormalities. The hernia was reduced, small bowel resected and primary side to side anastomosis performed, following which the patient made a good recovery and was discharged 5 days later.
DISCUSSION: The insidious onset of transmesenteric herniae and lack of specific radiological or laboratory investigations reaffirms the importance of surgeons maintaining a high index of suspicion for this critical surgical emergency.
CONCLUSION: Close monitoring of the patient's general condition in cases of non-specific abdominal pain is essential to identify the rare deteriorating patient for early surgical intervention and optimal outcome.

1. Introduction

Internal herniae are a rare cause of intestinal obstruction in adults. Of internal hernia congenital transmesenteric hernia only constitute an estimated 5–10% of cases.[1] Congenital mesenteric herniation leads to a variable degree of vascular compromise to the herniated bowel with ensuing obstruction, strangulation and bowel ischaemia. In published literature only 36 patients have suffered from bowel obstruction and 9 from ensuing ischaemia secondary to transmesenteric hernia.[2–16] We report a rare case of a 26-year-old female with spontaneous transmesenteric hernia of jejunum and proximal ileum due to a congenital mesenteric defect.

2. Presentation of case

A 26 year old female, Ms. P, presented at 2 pm to Cairns Base Hospital Emergency Department (ED) with sudden onset, 'crampy', central abdominal pain, which she rated as 6/10 in severity. The pain had started 5 h previously and radiated to her back. Experiencing some associated nausea she had vomited clear fluid once in the ED. The patient had experienced no fevers, dysuria, or change of bowel habit, no per rectal or per vaginal bleeding and systematic review was unremarkable. 3 months ago she had a copper intrauterine device inserted with no subsequent problems. She has had no previous abdominal operations, no significant past medical history or family history and takes no medications.

On examination she was haemodynamically stable and apyrexial with a soft abdomen and mild generalised lower abdominal tenderness. No rebound tenderness or guarding was detected. Further systemic examination was unremarkable. Blood tests were unremarkable with a white cell count of $10.3 \times 10^9\,L^{-1}$, neutrophils $7.0 \times 10^9\,L^{-1}$, Hb $150\,g\,L^{-1}$, Plts $189 \times 10^9\,L^{-1}$, CRP $< 2\,mg\,L^{-1}$ and lipase $30\,mmol\,L^{-1}$. Urea and electrolytes and liver function tests were within normal range. Plain abdominal film showed some faecal loading of the colon but was otherwise unremarkable with no free air under the diaphragm (see Fig. 1). Initially the patient was treated with analgesia and an abdominal ultrasound was ordered, with the surgical team planning to perform laparoscopy the following day for definitive diagnosis if there was no improvement.

At 8 am on day 2 of admission Ms. P's lower abdominal pain had become severe and she had now become tachycardic with a heart rate of 108, however she maintained her blood pressure at 122/72 and her other vital signs were normal. On examination the patient again had generalised lower abdominal tenderness but no evidence of peritonism. The decision was made to proceed with a diagnostic laparoscopy.

Abdominal ultrasound performed prior to the laparoscopy on day 2 of admission revealed localised fluid adjacent to the right ovary, IUD in situ and no evidence of appendicitis or gall stones. Some fluid filled loops of small bowel were visualised but no definite abnormality detected.

Before her laparoscopy Ms. P was reviewed by the obstetrics and gynaecology team who, on request of the patient, removed her

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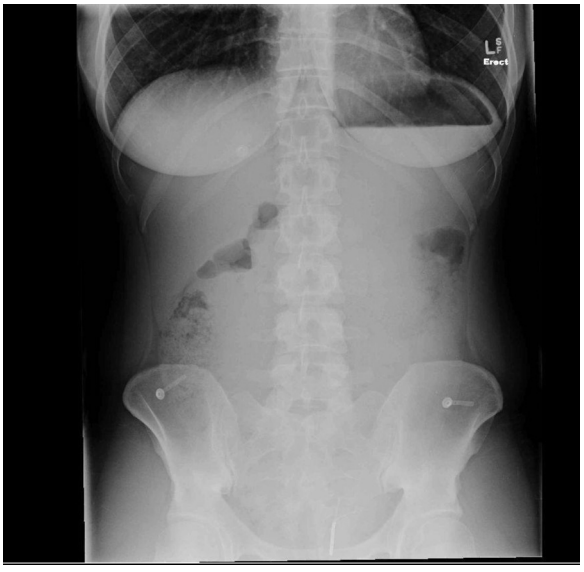

Fig. 1. Plain abdominal X-ray of patient on day of admission.

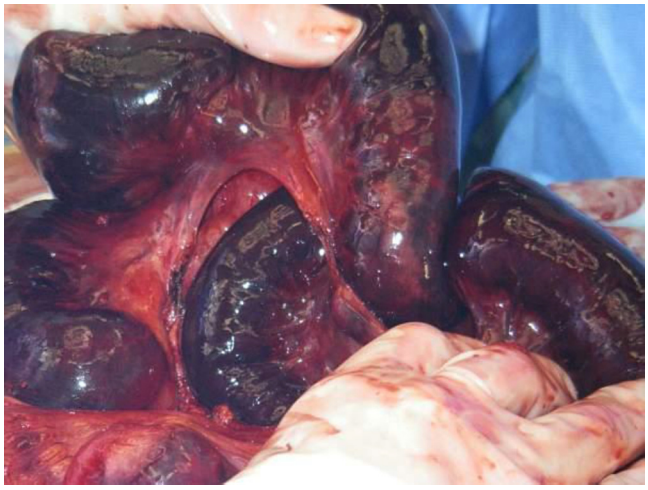

Fig. 2. Gangrenous bowel evident herniating through small bowel mesenteric defect.

IUD and the following examination concluded there was no obvious gynaecological abnormality responsible for her symptoms.

Exploratory laparoscopy was performed on day 2 at 6 pm and on finding ischaemic small bowel and free haemoserous fluid it was converted to a 15–16 cm midline laparotomy. Findings included approximately 1 m of gangrenous small bowel, jejunum and proximal ileum herniating through a congenital small bowel mesenteric defect (see Fig. 2). The hernia was reduced, small bowel resected and primary side to side anastomosis performed. Ms. P made a good recovery and was discharged from hospital 5 days later.

Histopathology revealed haemorrhagic infarction of 108 cm of small bowel and mesenteric vessels showed no evidence of vasculitis or thrombosis.

3. Discussion

An internal hernia is a protrusion of viscera through a defect or aperture, either mesenteric or peritoneal, and may be either congenital or acquired. Most internal herniae are paraduodenal (53%) and are acquired postoperatively, resulting from incomplete closure of surgically created mesenteric defects.[17] A transmesenteric hernia is a form of internal hernia through a congenital defect in the mesentery. Despite the congenital nature of transmesenteric haerniae they can present at any age, though they are more common in the paediatric population.[2] The pathogenesis of mesenteric defects is uncertain with one popular hypothesis suggesting the cause may be prenatal intestinal ischaemia and subsequent thinning of the mesenteric leaves, because prenatal intestinal ischaemia is associated with bowel atresia in 5.5% of the paediatric population.[18] Alternatively a genetic aetiology has been suggested given the association between transmesenteric herniae and other anomalies including cystic fibrosis and hirschprung disease.[17]

Only 13 adult case reports (male:female ratio 5:8) of bowel obstruction secondary to congenital mesenteric defects have been documented in published literature[2–13], one of which was diagnosed at autopsy[5], and 4 of which were documented to have developed bowel ischaemia.[2–4,11] Subgroup analysis of 10 of these adult case reports reveals an age range of 19–68 years, a mean age of 33 years and a wide spectrum of clinical presentations ranging from diarrhoea and vomiting with the patient not appearing 'particularly ill' and non-specific abdominal signs to severe abdominal pain, shock and unexpected death.[2–5,7,8,11] In one unusual case of a 45 year old lady a congenital mesenteric defect was detected incidentally during radical cystectomy for muscle invasive transitional cell carcinoma of the bladder.[13] In 4 of these 10 cases CT scanning was utilised pre-operatively to aid diagnosis, [4,8,11] and in 1 patient who was pregnant a plain abdominal film demonstrated early signs of intestinal obstruction prompting surgical intervention.[7] Of these 10 patients there were reportedly 2 patient mortalities [5,11] and the other 8 patients made uncomplicated recoveries following operative intervention.

Further cases of bowel obstruction and ischaemia secondary to transmesenteric hernia have been reported in several epidemiological studies. A retrospective review in Mississippi between 1970 and 1983 identified 8 patients with small bowel obstruction secondary to congenital internal herniation of which 5 patients had developed gangrenous bowel.[13] Furthermore in a 10 year retrospective review of management of internal hernia in Taiwan 6 patients suffering from transmesenteric herniae were identified, with rebound tenderness, advanced leucocytosis (>18,000 mm (3)) and a high level of manual band form (>6%) being identified as positive predictive factors for bowel ischaemia.[15]

9 patients suffering with congenital mesenteric hernia were identified in a recent 7 year retrospective review of internal hernia in Turkey, which concluded acquired hernia had become the most prevalent type of internal hernia and carried a significantly higher post-operative mortality rate.[16]

Multiple cases of small bowel obstruction and ischaemia caused by congenital mesenteric defects have been reported in children with presentations ranging from symptoms of intestinal obstruction to unexpected death.[5,18]

In this rare case Ms. P presented with sudden onset, central abdominal pain of 5 h duration with no evidence of peritonism on examination and initially haemodynamically normal with no biochemical abnormalities detected on blood tests. On day 2 of admission with worsening abdominal pain and having become tachycardic the decision was made to proceed with laparoscopy, which on converting to open laparotomy revealed 1 m of gangrenous small bowel, jejunum and proximal ileum herniating through a congenital small bowel mesenteric defect.

Preoperative diagnosis of transmesenteric herniae is difficult due to a lack of specific radiological or laboratory findings to confirm a surgeon's clinical suspicion. Misdiagnosis and subsequent delayed exploration may lead to bowel ischaemia and subsequent mortality, prognosis being directly correlated with the delay in diagnosis and treatment.

Uncertainty remains as to the efficacy of computer tomography scans (CT) for patients in whom acute mesenteric ischaemia is suspected with general radiologists' performance being lower than previously reported in a recent retrospective study, only diagnosing bowel ischaemia with a sensitivity of 83% and a specificity of 67%.[19]

The acute abdomen is not a specified disease but a constellation of symptoms including severe abdominal pain presenting within a 24 h period. This case underlines the importance of the timely use of diagnostic laparoscopy in solving the diagnostic dilemma of the unspecified acute abdominal pain in the virgin abdomen allowing both the inspection of the abdominal cavity in addition to definitive surgical intervention.[20]

4. Conclusion

We report a rare case of a 26-year-old female with a spontaneous transmesenteric hernia of jejunum and proximal ileum with associated gangrene of bowel caused by a congenital mesenteric defect. The insidious onset of this surgical emergency reaffirms the importance of surgeons maintaining a high index of suspicion for a transmesenteric hernia in patients with non-specific clinical and radiological signs. Close monitoring of the patient's general condition in cases of non-specific abdominal pain is essential to identify the rare deteriorating patient for early surgical intervention and optimal outcome.

Conflicts of interest

The authors declare that they have no conflict of interest in writing this case report.

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal on request

Author's contributions

Mr. James Butterworth designed the study with the help of colleagues below, collected the data from notes with help of colleagues as documented below, wrote first draft of the paper and continued to edit and amend the paper with decisive help and input from Dr. Trent Cross, Mr. William Butterworth, Dr. Paul Mousa and Mr. S. Thomas

Dr. Trent Cross helped in acquisition of data from notes, helped revise critically important intellectual content and gave final approval of the version to be submitted.

Mr. William Butterworth helped in interpretation of the data, helped revise critically important intellectual content and gave final approval of the version to be submitted.

Dr. Paul Mousa helped in acquisition of data from notes, helped revise critically important intellectual content and gave final approval of the version to be submitted.

Mr. S. Thomas helped in interpretation of the data, helped revise critically important intellectual content and gave final approval of the version to be submitted.

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