Peritoneal encapsulation; a rare cause of bowel obstruction

DGL Griffith, M Boal, T Rogers

Bristol Royal Hospital for Children, Bristol, UK

ABSTRACT

Peritoneal encapsulation is a rare congenital cause of bowel obstruction in children. We present the case of a 12-year-old male with severe dehydration and recurrent episodes of vomiting. This pathology should be considered in cases of bowel obstruction with a virgin abdomen.

KEYWORDS

Intestinal obstruction

Accepted 24 July 2016

CORRESPONDENCE TO

David Griffith, E: dgriffith1@doctors.org.uk

Case history

A 12-year-old male with a history of autistic spectrum disorder presented to his local hospital with 6 days of intermittent vomiting. He had significant intravascular depletion with pre-renal acute kidney injury. During his emergency department attendance he suffered a tonic-clonic seizure secondary to severe hyponatraemia (106mmol/l). He was transferred to the regional paediatric intensive care unit for correction of his fluid and electrolyte derangements and consideration of haemodialysis. His renal function normalised without the need for haemodialysis. On day 2 of his ward stay he developed abdominal pain and further vomiting that became faeculent. His abdomen became distended but he continued to pass stool. A nasogastric tube was placed and an abdominal radiograph was performed (Fig 1).

An ultrasound of the abdomen confirmed fluid-filled loops of bowel with a radiologically normal appendix. The patient's level of consciousness deteriorated. He developed unintelligible speech and his pain became less localised (Glasgow coma score 13/15). An urgent MRI of his head was normal.

Urgent laparotomy was performed. Intraoperatively the mid small bowel was found to be encased in what appeared to be peritoneum with no inflammatory exudate (Fig 2). The covering peritoneum had an aperture with a tight neck causing bowel obstruction in viable bowel (Fig 3). The findings did not correlate with any of the nine described types of internal hernia.¹ The peritoneal covering was completely excised, together with adhesiolysis of multiple congenital adhesions. The peritoneal attachments of the small bowel mesentery were carefully assessed to exclude malrotation. The patient also had gangrenous, acalculous cholecystitis requiring cholecystectomy and drain placement.

Postoperatively, the patient was managed in intensive care for 24 hours before transfer to the surgical ward. His feeds were reintroduced and the drain was removed after a week. He was discharged 9 days postoperatively. The histopathological report described peritoneum with marked congestion and focal mixed inflammation with a section suggestive of a reactive nodular fibrosis. It also confirmed acalculous cholecystitis.

Figure 1 Abdominal radiograph demonstrating bowel dilatation and gas in the rectum

Figure 2 Peritoneal encapsulation of small bowel

Discussion

Congenital peritoneal encapsulation is a rare cause of bowel obstruction in children and adults. It is characterised by complete or partial covering of a segment of small bowel. The embryological pathogenesis is postulated to be abnormal return of small bowel to the abdominal cavity during the 12th week of pregnancy. This occurs with migration of the yolk sac and intestine from the umbilical pedicle.² The condition was first reported in a cadaver by Cleland in 1868.³ The natural history is uncertain, but the peritoneal sac can cause obstruction due to a narrow aperture, as in this case, or may progressively fibrose over time to form a thickened capsule, reported by other authors.^{2,4}

Peritoneal encapsulation has been reported symptomatically in 41 children (two case series include adults and children) and both symptomatically and asymptotically in adults. The incidence has not been estimated. A greater proportion of cases are described in adolescent girls.

Bowel encapsulation is also reported in a separate entity known as sclerosing peritoneal encapsulation. Sclerosing

Figure 3 Obstruction of small bowel by peritoneum

peritoneal encapsulation is acquired following peritoneal insult and has been attributed to multiple causative factors, of which peritoneal dialysis is the most frequent with rates up to 19.4%.⁵

Conclusion

Congenital peritoneal encapsulation is a very rare cause of bowel obstruction in children and adults. Complete excision of the peritoneal encapsulation and adhesiolysis of multiple congenital adhesions is required. A thorough laparotomy is needed to exclude other pathology.

References

1. Takeyama N, Gokan T, Ohgiya Y *et al*. CT of internal hernias 1. *Radiographics* 2005; **25**(4): 997–1,015.
2. Naraynsingh V, Maharaj D, Singh M *et al*. Peritoneal encapsulation: a preoperative diagnosis is possible. *Postgrad Med J* 2001; **77**: 725–726.
3. Cleland J. On an abnormal arrangement of the peritoneum, with remarks on the development of the mesocolon. *J Anat Physiol* 1868; **2**(2): 201–206.
4. Sherigar JM, McFall B, Wali J. Peritoneal encapsulation: presenting as small bowel obstruction in an elderly woman. *Ulster Med J* 2007; **76**: 42–44.
5. Kawanishi H, Moriishi M. Epidemiology of encapsulating peritoneal sclerosis in Japan. *Perit Dial Int* 2005; **25**(4): 14–18.