

Ileocecal intussusception following appendectomy

Norman O'Neil Machado

Postoperative intestinal obstruction (POI) is a well-recognized complication usually related to peritoneal adhesions. It is an uncommon and frequently overlooked cause of intestinal obstruction and accounts for 5% to 10% of postoperative ileus in children.¹ The actual incidence of postoperative intussusception following laparotomy is low and varies from 0.01 to 0.25%.¹⁻⁴ Following an appendectomy, the inverted appendicular stump⁵ could be the leading point of cecocolic intussusception, but more often a predisposing lesion is not found, particularly in ileocecal intussusception.^{5,6}

Case

A 15-year-old girl presented with a history of right iliac fossa pain associated with nausea of 12 hours duration. She was afebrile and had right iliac fossa tenderness and guarding. Investigations including a complete blood picture and electrolytes were normal except for mild leukocytosis (WBC-12.4x10⁹/L). She underwent appendectomy with inversion of the appendicular stump through a McBurney's incision. The appendix was found to be acutely inflamed, which was confirmed later on histopathology. The caecum and adjoining ileum were normal. On the second postoperative day she complained of vague lower abdominal discomfort which progressed to nausea and vomiting 12 hours later. The abdomen was tender and guarded over the incision in the right iliac fossa and the abdomen was mildly distended; however, a definite mass could not be appreciated. A plain X-ray abdomen revealed multiple air fluid levels in the small gut involving the distal ileum. An ultrasound followed by CT scan suggested an ileocecal intussusception (Figure 1). Laparoscopy was then carried out under general anesthesia with intent to reduce the intussusception. The initial port was introduced at the umbilicus through an open technique. The distal ileum was found to be congested, edematous and grossly dilated and the cecum was congested and distended with the intussusceptum. Failure to laparoscopically reduce the intussusception resulted in laparotomy. Inability to manually reduce the intussusception at laparotomy required limited resection with an ileocolic anastomosis in two layers. The ileal intussusceptum within the caecum (Figure 2) was ischemic, but no mucosal lesion was found forming the leading point of the intussusception. The postoperative period was uneventful and the patient was discharged on the sixth postoperative day.

Discussion

The incidence of POI is estimated to be around 0.22% of all laparotomies.¹⁻² Usually after a symptom-free postoperative interval of less than one week, signs of small bowel obstruction become apparent. The symptoms start within 1 week in 64% and within 2 weeks in 90% of cases.¹⁻³ In contrast, obstruction due to adhesions usually produces symptoms more than 2 weeks following surgery.¹⁻²

There are several theories regarding POI. Plausible theories include

*From the Department of Surgery
Sultan Qaboos University Hospital
Muscat, Oman*

*Correspondence and reprint
requests:*

*Norman Machado, MBBS MS
FRCSEd*

*Consultant, Department of Surgery
Sultan Qaboos University Hospital
P.O. Box 38, Postal Code 123*

Muscat, Oman

Fax: +968-513 851

norman@omantel.net.om

Accepted for publication

May 2005

Ann Saudi Med 2006;26(4):315-317

Figure 1. CT scan showing the ileocaecal intussusception, appearing as a sausage-shaped mass with concentric rings of bowel (curved arrows), within the caecal wall (straight arrows).



Figure 2. Resected specimen showing the ischaemic ileal intussusceptum (curved arrows) within the opened caecal wall (straight arrows).



local spasm or edema of the bowel wall, prolonged anesthesia with electrolyte imbalance, abnormal postoperative peristalsis, chemotherapy, radiation and bowel ischemia.^{4,5,7} Potential leading points may be the anastomotic suture line, an appendiceal stump or the presence of intestinal tubes.^{5,6,7,8} The etiology of intussusception following appendectomy is, however, not completely understood. Invagination of the stump may be associated with a small abscess which in turn may act as a lead point of intussusception,⁹ but cases of cecocolic intussusception have been reported in which the stump was not inverted.^{6,9} Abnormalities of rotation of the intestine have also been implicated in the etiology and the resulting mobile cecum may predispose to intussusception of the appendiceal stump.⁷ While intussusception following appendectomy could be a consequence of an inverted appendicular stump forming the leading point, it is most often idiopathic.^{1,5}

A prelaparotomy diagnosis of POI is difficult in the absence of a high index of clinical suspicion. An increase in the nasogastric aspirate or persistent bilious vomiting in a patient with an otherwise normal postoperative course should raise the suspicion of

POI.^{2,3,4,5,8} Pain, distension and abdominal tenderness are not reliable features owing to the confounding factors of the preceding surgery, as in our patient. This invariably leads to a delay in diagnosis. The presence of a palpable mass, which is uncommon, warrants an early surgery as the possibility of strangulated intussusception is very high.^{2,4,7,8} The most important differential diagnosis of POI is adhesive intestinal obstruction; however, it usually occurs in the late postoperative period.

Being extremely difficult, a clinical diagnosis of POI needs radiological investigation to establish it. Both plain X-ray and contrast studies may be of limited use.⁴ A plain X-ray of the abdomen shows features of small bowel obstruction and may not be diagnostic of intussusception.^{2,3,5,7} When the plain films are normal or inconclusive, contrast studies may be required to document intussusception.^{4,6,7} Contrast enemas may, however, be unrewarding since the intussusception usually starts in the small bowel and may not reach the colon.^{3,4,7} Upper GI contrast studies may determine the level and type of mechanical obstruction but may miss the diagnosis in some patients.^{3,4} Abdominal ultrasound is helpful in differentiating between mechanical obstruction and functional ileus.^{3,10} It is recommended in patients with clinical signs of obstruction and a "gasless" plain film and may be a substitute for contrast examination.^{2,3,10} US may reveal the characteristic findings of a "doughnut" or pseudokidney sign on transverse and longitudinal scans, respectively.¹⁰ In patients with abnormal nonspecific clinical findings and gaseous abdominal distension, as in our patient, a CT scan may be useful.¹¹ A CT scan is reliable in showing small bowel obstruction, including intussusception, which appears as concentric rings of bowel or a sausage-shaped mass (Figure 1). A CT scan may differentiate between mechanical obstruction and functional ileus and can diagnose strangulation of the bowel.¹¹ The judicious use of US and CT scanning has increased the preoperative diagnosis of POI to 80%, which in the past was only 3% to 5%.¹⁻³

Reports of nonoperative reduction are few, mainly because of lack of preoperative diagnosis.^{2,4} In the presence of localized tenderness and guarding pointing towards the possibility of a complicated intussusception as in our patient, a definitive approach in the form of laparoscopy/laparotomy is preferred to a nonoperative reduction. At laparotomy most authors comment on the ease of manual reduction and achieve reduction in about 80% to 100% of cases.^{3,4,5} Indications for resection include strangulation of the

bowel, doubtful viability of the bowel, or if reduction is not possible.^{4,8} Postoperative recovery is usually rapid and no recurrence has been reported. In recent years, however, the usefulness of laparoscopy in diagnosing and treating intussusception has been reported.^{12,13} In one of the reports, the laparoscopic technique was successful in treating 65% of 98 cases of intussusception.¹³ The authors felt that every form of intussusception without bowel necrosis is amenable for laparoscopic reduction.¹³

In conclusion, postoperative intussusception most commonly occurs in the first 2 weeks after surgery and should be suspected when there is a sudden reversal of an otherwise uneventful recovery or persistent ileus after abdominal surgery. Ultrasound and CT are useful in establishing the diagnosis. Failure to make an early diagnosis due to confounding factors in the preceding surgery enhances the risk of failure of manual reduction, warranting a resection for possible irreducibility or gangrene.

References

1. Mollitt DL, Ballantine TV, Grosfeld JL. Post-operative intussusception in infancy and childhood. An analysis of 119 cases. *Surgery* 1979; 86: 402-8
2. De Vries S, Sleeboom C, Aronson DC. Post-operative intussusception in children. *Br J Surg* 1999;86:81-3
3. Linke F, Eble F, Berger S. Post-operative intussusception in childhood. *Pediatr Surg Int.* 1998; 14(3):175-7
4. West KW, Stephens B, Rescorla FJ, Vane DW, Grosfeld JL. Post-operative intussusception: experience with 36 cases in children. *Surgery* 1988;104(4):781-7
5. Holcomb GW 3rd, Ross AJ 3rd, O'Neill JA Jr. Post-operative intussusception: Increasing frequency or increasing awareness? *South Med J.* 1991;84(11):1334-9
6. Liu KK, Ku KW, Lee KH. Caecocolic intussusception in a child: a postoperative complication of appendectomy. *Eur J Surg.* 1996; 162(8):665-6
7. Tatekawa Y, Muraji T, Nishijima E et al. Postoperative intussusception after surgery for malrotation and appendectomy in a newborn. *Pediatr Surg Int.* 1998;14:171-2
8. Maroju NK, Srinivasan K, Kadambari D, Vaithiswaran V. Postoperative intussusception in the adult: a case report. *Trop Gastroenterol.* 2004; 25:40-1
9. La Salle AJ, Andrassy RJ, Page CP, et al. Intussusception of the appendiceal stump. *Clin Pediatr* 1980;19:432-35
10. Carnevale E, Graziani M, Fasanelli S. Post-operative ileo-ileal intussusception; sonographic approach. *Pediatr Radiol* 1994;24(3):161-3
11. Balthazar EJ, George W. Holmes lecture. CT of small bowel obstruction. *AJR Am J Roentgenol* 1994;162(2):255-61
12. van der Laan M, Bax NM, van der Zee DC, Ure BM. The role of laparoscopy in the management of childhood intussusception. *Surg Endosc.* 2001;15(4):373-6
13. Alonso V, Targarona EM, Bendahan GE, Kobus C, Moya I, Cherichetti C, Balague C, Vela S, Garriga J, Trias M. Laparoscopic treatment for intussusception of the small intestine in the adult. *Surg Laparosc Endosc Percutan Tech.* 2003;13(6):394-6