

DOUBLE ILEO-ILEAL INTUSSUSCEPTION CAUSED BY MESENTERIC LYMPHADENITIS ASSOCIATED WITH MULTIRESISTANT STAPHYLOCOCCUS EPIDERMIDIS PERITONEAL INFECTION

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Abstract

In intussusceptions one segment of the bowel (the intussusceptum) passes onwards inside the adjacent distal bowel (the intussusciens). The apex of the intussusceptum is termed the lead point. Once this telescoping phenomenon becomes established, intestinal obstruction follows. Ileocolic intussusception represents one of the more common surgical emergencies in the first 2 years of life, the peak incidence is in infants 5-9 month old. However ileo-ileal intussusception is rare and occurs in older children or infants less than 3 months of age. It is usually associated with other medical conditions (Henoch-Schönlein purpura, cystic fibrosis, hematologic dyscrasias) and occasionally occurs after major abdominal surgery. We present the case of a 4 year old boy with a double ileo-cecal intussusception with mesenteric lymphadenitis as a lead point, associated with multiresistant *Staphylococcus epidermidis* peritoneal infection. This case highlights the use of ultrasound in diagnosing this pathology and how helpful it can be in diagnosing the cause of small bowel obstruction in children.

Key words: ileoileal intussusception, ultrasound, multiresistant *Staphylococcus*

Introduction

Colicky abdominal pain, with or without vomiting, is seen often in infants and in most instances does not reflect significant pathology (colic of infancy, constipation). A serious cause of colic is however intussusception. In intussusception, one segment of the bowel (the intussusceptum) passes onwards inside the adjacent distal bowel (the intussusciens). The apex of the intussusceptum is termed the lead point. Once this telescoping phenomenon becomes established, intestinal obstruction follows.

Intussusception may be idiopathic or secondary to a lead point (2-12% of infants and children with intussusception). This is seen most commonly in infants younger than 3 months or older than 5 years of age. The lead points include Meckel's diverticulum, enlarged mesenteric lymph nodes, benign or malignant tumors of the mesentery or the intestine, mesenteric or duplication cyst, ectopic pancreatic and gastric rests, inverted appendiceal stumps, intestinal hematomas secondary to abdominal trauma, submucosal hematomas, intestinal hemangioma, Kaposi

sarcoma, posttransplantation lymphoproliferative disorders. Intussusception can also be classified according to site: over 90% of patients have a ileo-colic or ileo-ileo-colic intussusception, enteroenteral intussusception is rare (between 1-8 % of all childhood intussusceptions).

Case report

A 4 year old boy was presented by his parents at the emergency department of our hospital with a history of 24 hours of colicky abdominal pain and vomiting. The vomiting was described as initial nonbilious and then bilious. The last bowel movement was the day before. There was no significant patient history of preexisting illness. From the anamnesis we found out that he had an upper respiratory tract infection 2 weeks before, treated at his family doctor's office.

At examination the patient was very anxious. The local exam revealed a normal shape of the abdomen, with periumbilical tenderness at palpation and no signs of peritoneal irritation. Rectal examination was normal. The abdominal X-ray did not reveal any air-fluid levels as sign of intestinal obstruction. There was a paucity of gas in the lower abdomen. An ultrasound examination revealed however images that were suggestive for a small bowel obstruction caused by intussusceptio

The patient underwent emergency laparotomy. When opening the peritoneal cavity a small amount of serous fluid was found. A sample of this fluid was sent for microbiology examination and culture. Two small bowel intussusceptions were found at operation. These were reduced and the bowel did not show any signs of necrosis. Mesenteric adenopathy was found to be the lead point of intussusceptions. No Meckel's diverticulum or other anomalies were found. A tactical appendectomy was performed. The postoperative course was uneventful. The patient received antibiotherapy with Piperacillin-Tazobactam. The microbiology examination of the peritoneal fluid revealed an infection with multiresistant *Staphylococcus epidermidis* for which therapy with Linezolid was started (iv and afterwards syrup per os). The patient was released from the hospital on the 7th postoperative day. A follow-up visit showed good healing of the surgical wound and no postoperative problems.

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Discussion

Intestinal intussusception is the most common cause of intestinal obstruction in early childhood. It is an abdominal emergency.

The debut is usually acute. Clinical signs include a triad of symptoms, including vomiting, abdominal pain and passage of blood per rectum or currant jelly stools. The vomiting is usually nonbilious to start with, but when intestinal obstruction occurs it becomes bilious. As the condition progresses the infant develops additional symptoms, including those associated with shock, such as paleness, lethargy and fever.

The diagnosis of intussusception can be very difficult in the early stages, as it may mimic other diseases, for example commun mesenteric lymphadenitis. A mass may be palpable in the right hypochondrium in the case of an ileo-colic or ileo-ileo-colic intussusception, but is hard to detect and is best palpated between spasms of colic, when the infant is quiet. The rectum abdominis muscle is also an obstacle, which can hide the abdominal mass and make it hard to palpate. In case of an ileo-ileal intussusception the mass is also very difficult to palpate and can be periumbilical. Rarely the mass may prolapse through the anal canal, usually the intussusception is self limited at the level of the transverse colon, because of the length of the mesentery. The rectal examination is therefore very important and can reveal the typical currant jelly stool in advanced intussusception, also one can sometimes palpate the mass (rare cases). Abdominal distension becomes apparent clinically when the obstruction becomes complete. Plain abdominal radiographs reveal signs that suggest intussusception in only 60 % of cases. They may be normal in early stages of intussusceptions. Many authors seem to agree that the plain abdominal radiograph is unsafe (1,2,3,4,5,6,7,8,9,10,11). A very interesting study was performed by Eklof and Hartelius (12) which concluded that the hallmarks of the condition were scant abdominal gas in 89% of cases, this abnormal appearance augmented by scanty faecal content in 82%, with an obscure abdominal mass lesion in 62% of patients.

As the disease progresses, the earliest radiographic signs include an absence of air in the right lower and upper quadrants and a right upper quadrant soft tissue density which is present in 25–60 % of patients. These findings are followed by features of small bowel obstruction, with dilatation and air-fluid levels in the small intestines (13).

However ultrasonography is the main stay of diagnosing intussusception with an overall sensitivity and specificity of 97.9 and 97.8 %, respectively. Ultrasonography should be the first examination in those patients with suspected intussusception. The ultrasonographic signs of intussusception include the target and pseudokidney signs as well as dilated bowel loops (14). Enlarged ovoid hypoechoic mesenteric lymph nodes of more than 4 mm in short axis are usually found in the invaginated mesentery or mesocolon, mainly at the invagination neck.

Sonographic detection of a small-bowel intussusception is more difficult than for the usual ileocolic form. The intussusceptions may be found deep in the

abdomen surrounded and obscured by air-filled or fluid-filled dilated loops because of the associated small-bowel obstruction (15, 16, 17). Therefore, a graded and patient compression of the entire peritoneal cavity is mandatory. The only diagnostic feature of the anatomic type is a topographic one. Indeed, ultrasound always reveals a normal location of the ileocecal valve and colon. The lesions may be found in the paraumbilical or in the left abdominal regions (17). Kornecki et al. (14) found that small bowel intussusception was characterized on the sonogram by a smaller target lesion (2–3 cm) and was more commonly found in the paraumbilical or left abdominal regions. This is in concordance with the findings in the presented case.

In the case of the presented patient ultrasonography was diagnostic. Bartocci et al (2008) (15) found that ultrasonography showed great accuracy and sensibility in the diagnosis of intussusception. It can add important elements that the physicians can use to make the right choice of treatment. Moreover sonography is affirming as a safe guidance tool, in place of fluoroscopy, for hydrostatic or pneumatic nonsurgical reduction of children's intussusception.

Non-operative reduction is now considered by almost all paediatric emergency units as the method of choice for its treatment. The benefits to the patient of non operative reduction rather than surgery have been well documented. The discomfort to the patient of post operative pain and the risk of subsequent adhesive bowel obstruction occur only in those treated by laparotomy. In addition there are a number of other factors that represent significant morbidity. Nevertheless, patients with successful reduction have usually to be carefully observed in order to detect early recurrences and infectious complications. Tolerance of a normal diet is evaluated under medical control.

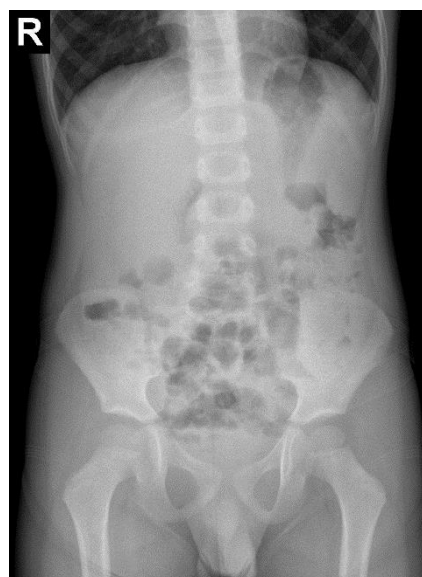


Fig. 1. X-ray of the abdomen.



Fig. 2. Ultrasound of the abdomen, showing intussusceptions (longitudinal section). There seemed to be two intussusceptions at different levels of the small bowel.



Fig. 3. Ultrasound of the abdomen, showing intussusceptions (transverse section). The positions of the intussusceptions where left paraumbilical and one of them was eventually palpable. A Doppler examination revealed an adequate perfusion to the affected gut

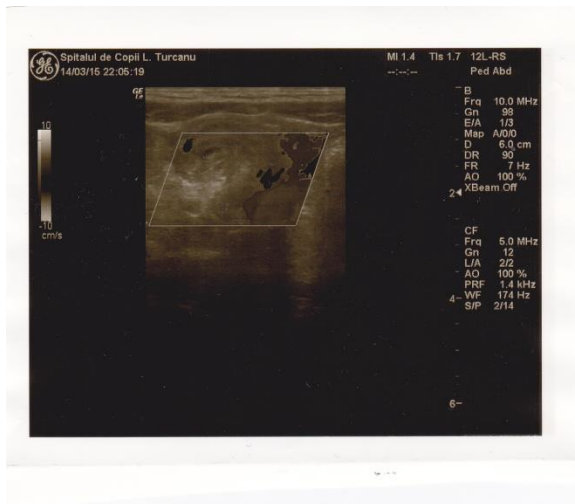


Fig.4. Doppler ultrasound of the intussusceptions showing adequate perfusion.

However in case of an ileo-ileal intussusception non-operative reduction is hard or impossible to obtain and some authors consider therefore that it is of no value in such a case.

Sometimes it is very hard to differentiate a small bowel intussusception from an ileo-colic one. Wiersma et al. (19) stated that small bowel intussusceptions (SBI) are usually shorter than ileo-colic ones.

In a study by Ko et al (20) the accuracy of sonography for detecting SBI in pediatric patients was 76.5%. The transverse diameter of the SBI lesions and the thickness of the outer sonolucent rim measured on sonograms had no predictive value for the presence of bowel complications. Blood flow detected on color Doppler sonography has been reported as an indicator of bowel viability (20).

In the case of SBI one must think of a possible lead point like a Meckel's diverticulum, myoepithelial hamartoma, heterotopic pancreatic tissue, mesenteric lymphadenitis, Kaposi sarcoma, Peutz-Jeghers syndrome etc, or other diseases like volvulus or perforated appendicitis (21,22,23,24,25,26). In a study by Newman et.al. (27) the authors stated that ruptured appendicitis can appear as a rounded, mass-like structure with multiple rings that can be easily mistaken for intussusception. Awareness of the possibility of this confusion should encourage more detailed, thoughtful scrutiny of the initial images, with a greater consideration of the possibility of complicated appendicitis. Particular attention should be paid to evaluating the presence of surrounding inflamed fat in appendicitis and intralesional hypoechoic lymph nodes in ileocolic intussusceptions. In situations where ultrasound or enema findings are unusual or at odds with the clinical picture, radiation concerns should not prevent the appropriate move to CT for clarification. MR is being used more commonly for the diagnosis of acute appendicitis and might also be an appropriate alternative in suitable patients. The CT scans obtained in the study by Newman et al (27) were diagnostic of ruptured appendicitis with no confusion with intussusceptions. CT can also be helpful in diagnosing associations of intussusception and other diseases, for example volvulus (22).

The treatment of ileoileal intussusceptions is surgical reduction with or without bowel resection. A small bowel intussusceptions can sometimes have a spontaneous reduction (28, 29).

Transient small bowel intussusceptions are short-segmented, self limited and without a leadpoint They are only transient phenomena and should be called benign small bowel intussusceptions (BSBI) (Doi et al. 2004) (29). They are usually found incidentally in asymptomatic patients or in children presenting with abdominal pain. They have no clinical significance because, in most of cases, direct

correlation of symptoms to ultrasonographic findings is absent or questionable (30). The high rate of patients with BSBI actually observed may be related to increased use of abdominal ultrasonography in children and improved image resolution and quality (30). Siaplaouras et al. (2003) (31) have reported that BSBI was frequently associated with lymphoid hyperplasia at ultrasonography. The frequency and number of BSBI are also increased in patients with celiac disease (31).

There have also been reports of patients with small bowel intussusception which have been treated conservatively (32).

Conclusions

In most cases of small bowel intussusception, surgery should not be delayed because of the high incidence of a leadpoint and also the need to obviate small bowel ischemic necrosis. The procedure consists of reduction of the intussusception alone or of intestinal resection for bowel necrosis and/or for a leadpoint with a termino-terminal anastomosis. In Burkitt lymphoma, surgery may be required either for the histological diagnosis of a localized tumor or for the treatment of an intussusception with bowel compromise. In the last years laparoscopy has proven to be a valuable method in treating small bowel intussusception since it provides a less invasive alternative and it might be expected to reduce the post-operative hospital time (33).

In a study by Yao et al.(34) based on statistical analyses of 316 operated cases among 5537 pediatric intussusception patients they found that female sex, length of history and ileo-ileal intussusception are the risk factors for loss of intestine viability.

Children with ileo-ileal intussusception are more endangered than those with other intussusception types for developing intussusception-associated loss of intestine viability. The reason might be that the early symptoms of ileo-ileal intussusception cases were mild and not typical, which might lead to the delay in diagnosis and treatment. Ko et al. (20) also indicated that pediatric small bowel intussusceptions typically presented with nonspecific clinical abdominal symptoms that sometimes led to delays in seeking appropriate medical care and further complications.

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