Partially reduced intussusception: when are repeated delayed reduction attempts appropriate?

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Abstract. The imaging techniques for diagnosis and monitoring of reduction of intussusception by fluoroscopy and ultrasound continue to evolve. The common goal of all protocols is to reduce the intussusception by enema in as many patients as possible and avoid laparotomy with its potential morbidity. We report two infants in whom the initial attempt at reduction by air enema only achieved partial reduction, from the descending colon to the transverse colon in one, and from the splenic flexure to the caecum in the other. Both patients became asymptomatic and clinically stable. In light of the clinical stability, and in consultation with the surgeons, laparotomy was deferred. Sonography was used to confirm the persistence of the intussusception before repeat air enema several hours later. Following three further air enemas in each child, the intussusceptions were successfully reduced after 20 h and 24 h respectively. Both patients remained asymptomatic and did not require surgery. In infants with partially reduced intussusception we suggest that if the patient becomes asymptomatic and stable, surgery can be safely delayed to permit further attempts at enema reduction. Sonography has a valuable role in determining the persistence of the intussusception prior to repeat enema. Close cooperation with the surgeon and careful clinical monitoring of the patient are essential requirements for this proposal.

Intussusception has traditionally been considered a surgical emergency necessitating early radiological or operative reduction. Radiological reduction utilizes barium, or air under fluoroscopy, and more recently saline under ultrasound guidance [1, 2]. Air reduction has been practiced in China for approximately 40 years, with good efficacy, and has only in the last decade been gaining acceptance in North America and Europe [3, 4]. With these radiological techniques, intussusceptions may be completely reducible, partially reducible (i.e. reduce partly along the colon, and then get stuck), or irreducible (i.e. not move at all on the first enema). Surgery has been considered necessary for partially reducible or irreducible intussusceptions.

Second attempts at radiological reduction have been reported previously [5]. Repeat barium enema has been described to differentiate a swollen ileocaecal valve from residual intussusception and to achieve reflux into the terminal ileum [6, 7]. Repeat enemas and sonographic studies in the operating room under general anaesthesia (GA) have also been proposed prior to operative reduction [8].

We describe careful observation of patients with intussusception and multiple reduction attempts without GA in the radiology department, after a partial initial reduction. We report two infants successfully managed in this manner.

Case reports

Case 1

A 4-month-old girl presented with a 24-h history of abdominal pain, irritability and passage of blood per rectum. Physical examination revealed a listless infant with a soft abdomen and a mass in the left flank. Plain abdominal radiographs showed small bowel obstruction. After fluid replacement, an air enema was performed. An intussusception was encountered at the splenic flexure and was partially reduced without difficulty to the caecum, with a definite intussusception remaining in the caecum (Fig. 1a). Prolonged persistent attempts failed to reduce it further. Fluoroscopy time was 3.8 min. The patient improved clinically with resolution of her abdominal pain and stabilization of her vital signs after the partial reduction. She was sent to the ward for close observation and returned to the radiology department 3 h later. Sonography showed a large bowel intussusception in the right iliac fossa (Fig. 1b), with moderate free fluid and fluid-filled loops of bowel proximally.

Repeat air enema reduced the intussusception through the ileocaecal valve and into the terminal ileum for a distance of only 8 cm, where the ileoileal component became stuck (Fig. 1c). Fluoroscopy time was 1.3 min. The infant remained asymptomatic and clinically stable. She continued to be closely observed. Repeat
Fig. 1a-d. Four-month-old girl with 24-h history of abdominal pain, irritability and blood per rectum. a Initial air enema showing an intussusception (arrows) at the level of the ileocaecal valve, as a soft tissue mass outlined by air. b Sonography 3 h later showing persistence of the large bowel intussusception, on cross section, identified in the right iliac fossa as a large doughnut lesion. c Repeat air enema after the sonogram showing reflux into the terminal ileum and outlining a residual small bowel intussusception (arrows) in the terminal ileum. d Sonography 3 h after the second air enema showing a small bowel intussusception, on cross section, in the right lower quadrant, which was subsequently reduced successfully with air.

Fig. 2a-d. Four-month-old girl with 24-h history of vomiting, abdominal pain and bloody stools. a Air enema 10 h after the first barium study showing residual barium. Air in the proximal transverse colon (arrow) outlines the persistent intussusception. b Air enema the following morning (12 h later) shows the intussusception (arrows) reduced as far as the proximal ascending colon. c Sonography after the second air enema shows a large bowel intussusception in the ascending colon prior to third reduction attempt. d Air enema 2 h after the sonogram achieves successful reduction of the intussusception, with reflux of air into the terminal ileum. Residual oedema of the ileocaecal valve present (arrows).