ORIGINAL ARTICLE

Success with hydrostatic reduction of intussusception in relation to duration of symptoms

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Accepted 19 May 2005
Published Online First 21 June 2005

Arch Dis Child 2005;**90**:1071–1072. doi: 10.1136/adc.2004.066332

Background: It is widely believed that hydrostatic reduction of intussusception is less successful in children with prolonged symptoms prior to presentation.
Aim: To prospectively evaluate success in relation to duration of symptoms.
Methods: Prospective study in which children, regardless of symptom duration, underwent an attempt at hydrostatic reduction.
Results: Of 113 children presenting with intussusception, 16 had peritonitis and required immediate laparotomy. A hydrostatic reduction was attempted in 97 and was successful in 77 (79%). There were 26 successful reductions with symptoms <12 hours (81%), 30 with symptoms for 12–24 hours (81%), and 21 with symptoms >24 hours (75%).
Conclusion: The success rate with hydrostatic reduction was not significantly influenced by symptom duration.

Intussusception is the most common abdominal emergency in early childhood, particularly in children younger than 2 years of age.[1]

It has been reported that successful hydrostatic reduction may be less likely in patients with symptoms for more than 48 hours, and consequently patients with prolonged symptoms are nowadays likely to undergo operative reduction as the first line treatment.[1–3] Since there is little evidence to support this policy we undertook a prospective study to examine our success with hydrostatic reduction in relation to duration of symptoms.

METHODS

All children presenting to the Sophia Children's Hospital, Rotterdam or the Juliana Children's Hospital, The Hague, with ultrasound proven intussusception from January 1998 to December 2002 were included. A hydrostatic reduction was performed unless there was clinical or radiological evidence of peritonitis or perforation. Patient details, including nature and duration of symptoms, physical findings, laboratory results, and the findings on abdominal *x* ray and ultrasound were prospectively recorded.

Hydrostatic reduction was performed using a standard protocol in which a 40 ml balloon catheter was positioned in the rectum, and a reservoir containing water soluble contrast medium was positioned 100 cm above the patient and contrast then instilled into the colon. If reduction did not occur the contrast reservoir height was increased to 120 cm. If this was unsuccessful the patient underwent a laparotomy.

Ethical approval for the study was obtained in both participating hospitals.

RESULTS

A total of 113 patients presented with an intussusception, 55 to the Juliana Children's Hospital and 58 to the Sophia Children's Hospital. There was a male dominance (3:2) and 84% were under 2 years of age. Presenting symptoms included vomiting (86%), abdominal pain (67%), and rectal blood loss (63%). An abdominal mass was palpable in 35%. The most commonly identified lead point appeared to be lymphoid hyperplasia, but in five cases a Meckel's diverticulum was responsible.

Peritonitis was present in 16. Of these bowel resection was necessary in seven, the other nine undergoing manual reduction. Of the seven requiring resection, six had presented with symptoms for more than 24 hours. However, of the nine in whom the intussusception could manually be reduced, six had symptoms for more then 24 hours.

Hydrostatic reduction was attempted in 97 (86%), and was successful in 77 (79%). There were 26/32 successful reductions with symptoms less than 12 hours, 30/37 with symptoms for between 12 and 24 hours, and 21/28 with symptoms for more than 24 hours (table 1). In the latter group 62% had symptoms for more than 48 hours, and the mean duration was 57 hours. In nine cases there was a recurrence of the intussusception within 12 hours of reduction. In four of these this was treated successfully by repeat hydrostatic reduction. The other five underwent laparotomy, and three required bowel resection (fig 1).

In 20 hydrostatic reduction was unsuccessful, including one case in which a bowel perforation occurred during the procedure. In 15 of these, resection of the intussusception was required; five of them had symptoms for more than 24 hours. In five of the 20, manual reduction was possible.

Table 1 Duration of symptoms and results of hydrostatic reduction

	<12 hours	12–24 hours	>24 hours	Total
Successful hydrostatic reduction	26 (81%)	30 (81%)	21 (75%)	77
Unsuccessful hydrostatic reduction	6 (19%)	7 (19%)	7 (25%)	20
Total	32	37	28	97

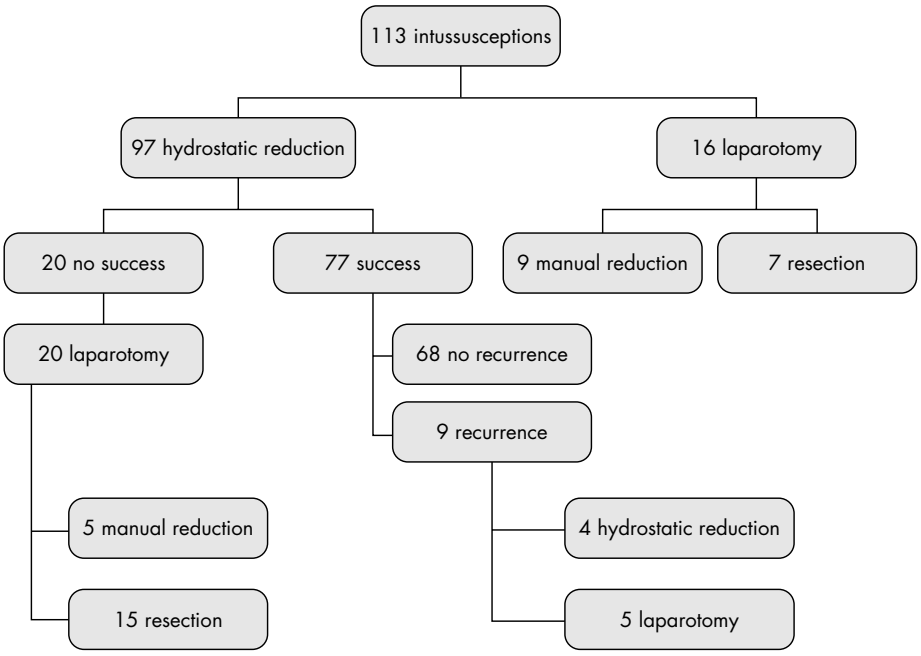

Figure 1 Summary of results.

DISCUSSION

The symptoms of intussusception are non-specific.[4–6] In our population only 13% of the children presented with classical symptoms. Ultrasound is a reliable diagnostic tool with a sensitivity and a specificity close to 100%.[7–11] The role of the abdominal radiograph is more controversial,[12 13] and its main value may be in excluding the presence of free air in the abdomen.

Non-operative reduction using barium or air contrast techniques is successful in about 75–90% of patients.[11] In this study the success rate with hydrostatic reduction was 79%. Several authors have reported that the success rate of hydrostatic reduction is lower and the risk of perforation risk higher in patients with symptoms for more than 48 hours,[1–3] while others have reported that although the likelihood of hydrostatic reduction may be reduced, the risk of complication is no greater in patients with a longer duration of symptoms.[14] In this study we did not find that the likelihood of successful hydrostatic reduction was less in those with more prolonged symptoms at presentation.

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Competing interests: none declared

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