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

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Abstract

**Background:** It is widely believed hydrostatic reduction of intussusception is less successful in children with prolonged symptoms prior to presentation. The aim of the study was to prospectively evaluate success in relation to duration of symptoms.

**Methods:** We carried out a prospective study in which children, regardless of the symptom duration, underwent an attempt at hydrostatic reduction.

**Results:** Of 113 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 hr (81%); 30 with symptoms for 12-24 hr (81%) and 21 with symptoms > 24 hr (75%).

**Conclusion:** The success rate with hydrostatic reduction was not significantly influenced by symptom duration.
Introduction

Intussusception is the most common abdominal emergency in early childhood, particularly in children younger than two 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. (1,2,3) Since there is little evidence to support this policy we undertook a prospective to examine our success with hydrostatic reduction in relation to duration of symptoms.

Patient and 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, 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 watersoluble 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 was performed.

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

Results

A total of 113 who 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 percent were under two 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 5 cases a Meckel’s diverticulum was responsible.

Peritonitis was present in 16. Of these bowel resection was necessary in 7, the other 9 undergoing manual reduction. Of the 7 requiring resection, 6 had presented with symptoms for more than 24 hr. However, of the 9 in whom the intussusception could manually be reduced; 6 had symptoms for more then 24 hr.

Hydrostatic reduction was attempted in 97 (86%), and was successful in 77 (79%). There were 26/32 successful reductions with symptoms less than 12 hr, 30/37 with
symptoms for between 12 and 24 hr, and 21/28 with symptoms for more than 24 hr. (Table 1). In the latter group 62% had symptoms for more than 48 hr, and the mean duration was 57 hr. In 9 cases there was a recurrence of the intussusception within 12 hours of reduction. In 4 of these this was treated successfully by repeat hydrostatic reduction. The other 5 underwent laparotomy, and 3 required bowel resection. (Figure 1)

In 20 hydrostatic reduction was unsuccessful, including one case in which a bowel perforation occurred during the procedure. In 15 of these 20 resection of the intussusception was required; 5 of these had symptoms for more than 24 hours. In 5 of the 20 manually reduction was possible.

Discussion

The symptoms of intussusception are non-specific. (4,5,6) 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%. (7,8,9,10,11) 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 to 90 percent 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,(1,2,3) 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.

Keywords: intussusception, hydrostatic reduction, duration of symptoms, recurrences, children

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Figure Legend

Figure 1: Results
References

Table 1

Duration of symptoms and results of hydrostatic reduction

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<th>12-24 hours</th>
<th>&gt; 24 hours</th>
<th>total</th>
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<td>Successful hydrostatic reduction</td>
<td>26 (81%)</td>
<td>30 (81%)</td>
<td>21 (75%)</td>
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<td>Unsuccessful hydrostatic reduction</td>
<td>6 (19%)</td>
<td>7 (19%)</td>
<td>7 (25%)</td>
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<td>total</td>
<td>32</td>
<td>37</td>
<td>28</td>
<td>97</td>
</tr>
</tbody>
</table>
113 intussusceptions

97 hydrostatic reduction

20 no succes

20 laparotomy

5 manual reduction

15 resection

16 laparotomy

77 succes

68 no recurrence

9 recurrence

9 manual reduction

4 hydrostatic reduction

7 resection

5 laparotomy
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