

Hydrostatic Reduction of Intussusception under Ultrasound Guidance in Children

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ABSTRACT

Introduction: The aim of the study is to analyse the efficacy of ultrasound-guided saline enema in reducing intussusception.

Materials and Methods: The charts of patients who were treated for ileo-colo-colic intussusceptions at two* institutions over the past 12 years (n=145) were reviewed retrospectively. Patients who were admitted with acute abdomen and required initial surgical therapy, were excluded (n=21).

Discussion and Results: Ultrasound-guided hydrostatic reduction (HR) was performed in 124 patients. There was no procedure-related complication. Seven children underwent a second attempt of HR because of recurrence and five of them required surgical intervention because of re-recurrence.

Conclusion: Ultrasound-guided hydrostatic reduction is a safe and effective method for the treatment of intussusception in patients without acute abdominal findings.

Keywords

Intussusception, Hydrostatic reduction, Ultrasound guidance.

Introduction

Intussusception is one of the most common causes of intestinal obstruction in infants and requires immediate intervention. There are many different conservative methods described in the literature [1-4].

After the report by Bolia [5], which described successful ultrasound-guided hydrostatic reduction (HR), this procedure was preferred in many institutions [6-9].

The purpose of this study was to analyse our experience with HR under ultrasound guidance with particular attention to age, duration

of symptoms and effectiveness of the method in the treatment of intussusception in children.

Materials and Methods

Data of patients with ileo-colo-colic intussusception between January 2003 and 2015 were retrospectively analysed.

After admission of the patient, first a fluid electrolyte correction was performed. HR was performed under ultrasound guidance by a team consisting of a radiologist and paediatrics surgeon. After inserting a Foley catheter into the rectum, warm saline was introduced via the catheter at up to 120 cm H₂O pressure.

The age of patients and the duration of symptoms were analysed statistically with the appropriate statistical tools, using the software

SPSS.

Results

The study included 124 children (78 boys, 46 girls) with a median age of 20 months (range 4–130 months). The mean duration of symptoms on admission was 1,35 days ranged 1-7 days (Table 1).

	Boys	Girls	Median	Range	Mean	Range
Sex	78	46				
Age (Months)			20	4-130		
Symptoms Duration (Days)					1,35	1-7

Table 1: Patient characteristics and duration of symptoms (n=124).

Children presented with symptoms of abdominal pain (85%), vomiting (75%) and rectal bleeding (25%).

Five patients required a redo HR. In these five patients the duration of symptoms was longer than 4 days. Recurrence intervals ranged from 12 hours to 3 days. All these patients underwent a second attempt at HR and five of them underwent surgical intervention because of re-recurrences. There was an overall 94,6% success rate of HR in this series. The average length of in-hospital stay for the patients after successful HR was 3.67 days. There was no procedure-related complication in the series.

Discussion

In the literature there are many reduction methods used for nonsurgical treatment of intussusception [1-4,5,8]. The classic conservative management has become barium enema reduction under fluoroscopy in the 1970s [2]. The most important disadvantage of these methods was exposing the child and medical team to radiation.

Ultrasound technology eliminated the radiation handicap and Bolia first reported successful ultrasound-guided HR and then popularized this method and performed with remarkable success rate, reaching 96% [5]. In our series the rate of successful reduction was 94.3%. There exist in the literature reports about ileocolic vs. colocolic intussusception, with some studies reporting low successful reduction rates for ileocolic intussusception and higher rates for colocolic types and this has not been adequately explained [9]. We found no significant data regarding this matter in our patients.

The duration of the symptoms abdominal pain, vomiting, and in particular rectal bleeding are the predictors of a failed enema reduction [6,7]. Our findings supported this statement: we observed recurrences with those children who had complaints for more than 4 days. It is well recognized that one of the most important complications of HR is perforation. Successful reduction without perforation needs a certain experience and skill. In our series all

HR were performed by an experienced team comprising a senior radiologist and paediatrics surgeon. A constant pressure of up to 120 cm H₂O is employed and waited with patience until the free flow of saline into the ileum is clearly demonstrated by ultrasound. We had to conduct a second attempt of HR for seven patients, however, there was no sign of any perforation. Karadag et al. reported a length of hospital stay after reduction of 1.51 days [6]. In our population the hospital stay was longer. This is explained by the uncertainty of the parents and no patients were discharged from hospital without having spontaneously defecated.

Conclusion

Ultrasound-guided hydrostatic reduction is a safe and effective method for the treatment of intussusception in patients without acute abdominal findings. A 94.6% success rate of HR in 124 patients without perforation is acceptable when comparing with other reported series.

Compliance with ethical standards

This study was designed retrospectively and does not contain any studies with human participants or animals performed by any of the authors.

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