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Hydrostatic Reduction of Intussusception under Ultrasound Guidance: An Initial Experience in a Developing Country

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Abstract

Background: Intussusception is one of the most common causes of acute intestinal obstruction in children. Hydrostatic reduction with barium enema is the widely accepted and preferred mode of treatment of uncomplicated intussuception. The aim of this study was to report our initial experience with hydrostatic reduction of intussusception.

Patients and Methods: We present our initial experience in which 8 patients had ultrasound guided hydrostatic reduction of intussusception over a period of 2 years. All patients that presented within 48hours of onset of symptoms were recruited into the study. Clinical diagnosis of intussusceptions was made in all of them while abdominal ultrasound was used to confirm the diagnosis.

Results: Half of the patients presented after 24 hours of onset of symptoms. Five patients (62.5%) had a successful reduction of their intussusception while three patients (37.5%) had incomplete reduction which was completed by surgery. There was only one (12.5%) recurrence and there was no peritonitis.

Conclusion: Ultrasound guided hydrostatic reduction of intussusceptions in this environment is possible when patients present early with low risk of complication and low recurrence rate.

Key Words: Intussusception, ultrasound guided, hydrostatic reduction, recurrence.

Introduction

Intussusception in children is an acute paediatric abdominal emergency that warrants immediate intervention. Intussusception is one of the commonest causes of acute intestinal obstruction in well nourished infants from 3 to 12 months old[1-4]. Pattern of presentation varies from one environment to another with only one third of cases having the classical clinical features of red currant jelly stool, abdominal colic and abdominal mass[1]. Ultrasonography is often the first line imaging modality for the diagnosis of intussusception[5-6].

In the past, treatment has been by surgical intervention until the end of the first half of last century[2,7], when various interventional radiological procedures (e.g. barium enema under fluoroscopic guidance and pneumatic reduction under ultrasound or fluoroscopic guidance) were used to reduce the intussusception.

In sub Saharan Africa, operative reduction is still the main method of treatment of intussusception[8-13]. The aim of this study was to report our initial experience with an interventional radiological procedure using normal saline under ultrasound guidance to achieve reduction of intussusception.

Materials and Method

A prospective study of patients admitted for intussusception in the emergency unit of University College Hospital, Ibadan Nigeria, was carried out over a two year period (July, 2004 and June 2006). All infants and children who presented with uncomplicated intussusception were included in the study while those with fever and features of peritonitis were excluded. All cases were diagnosed both clinically and radiologically with abdominal ultrasound. A double set up in which materials for the ultrasound guided reduction and the operating theatre were made ready to enable the failed cases to be operated upon immediately was prepared.

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Table 1: The Various Clinical Presentations and Outcome of Management

Age	Sex	Clinical Presentation	Duration of Symptoms	Investigation	Treatment	Outcome
8 mths	M	Excessive cry, vommiting, constipation, red currant and jelly stool. No fever	1 Day	Abdominal Ultrasound	Hydrostatic and operative reductions	Failed Hydrostatic reduction
1 Year	M	Excessive cry, diarrhea, vommitting and abdominal mass. No fever	2 Days	Abdominal Ultrasound	Hydrostatic reduction	Successful
7 mths	M	Vommitting red currant jelly stool, excessive cry and abdominal mass. No fever	2 Days	Abdominal Ultrasound	Hydrostatic reduction	Successful
5 mths	F	Excessive cry, vommiting, red currant jelly stool and abdominal mass. No fever	1 Day	Abdominal Ultrasound	Hydrostatic reduction	Successful
5 mths	M	Excessive cry, red currant jelly stool, vommitting and abdominal mass.	1 Day	Abdominal Ultrasound	Hydrostatic and operative reductions	Failed Hydrostatic reduction
8 mths	M	Vommitting red currant jelly stool and abdominal mass. No fever.	2 Days	Abdominal Ultrasound	Hydrostatic reduction	Successful
5 mths	F	Excessive cry, restlessness red currant jelly stool, and vommitting. No palpable abdominal mass or fever.	13 hours	Abdominal Ultrasound	Hydrostatic and operative reductions	Successful
1 Year	M	Excessive cry, vommitting red currant jelly stool and fever.	2 Days	Abdominal Ultrasound	Hydrostatic and operative reductions	Failed Hydrostatic reduction

Using an Aloka SSD 1700 Ultrasound machine with linear transducer of 7.5MHz, an initial transverse and longitudinal abdominal scan was done to localize the intussusception which was recognized by the 'dough nut' sign and 'pseudo kidney' sign on transverse and longitudinal scans respectively. (Figure I and II) An appropriate sized Foley's catheter was passed per rectum and the balloon inflated and secured in situ. Under ultrasound guidance and using a 50mls syringe, normal saline was carefully and continuously injec-ted through the cathe-ter while maintaining pressure. Reduction was deemed to have occurred on seeing a free flow of fluid in the bowel and the disap-pearance of the mass on ultrasound. The catheter was removed after deflating the balloon and the excess fluid was passed out by the patient. After a successful reduction, the patients were ad-mitted for observation for a period of 48 to 72 hours, after which they were discharged home for follow up.



Fig. I: Showing the 'Pseudo kidney sign' as seen on the longitudinal scan.

Results

Over the study period of 2 years, a total of 19 patients with intussusception were seen, but 8 patients (42.11%) were found to be suitable for the study. There were 6 boys and 2 girls and their ages

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Fig. II: Showing the 'Dough nut' appearance scan as seen on the transverse scan

ranged from 5months to 1year with a mean of 7.75months. They all presented with the classical symptoms of vomiting, excessive intermittent cry which may be due to abdominal pain, passage of bloody mucoid stool while some of them had palpable abdominal mass. The duration of symptoms varied between 13 hours and 2 days with a mean duration of 1.36 days. Clinical diagnosis of intussusception was made in all the patients and this was confirmed by an abdominal ultrasonography. They all had hydrostatic reduction under ultrasound guidance. Five (62.5%) cases of intussusception were successfully reduced, while 3 (37.5%) could not be completely reduced and required surgical reduction. All the patients were followed up for a period of 6 - 18 months with only one (12.5%) recurrence.

Discussion

Intussusception is one of the most common causes of intestinal obstruction in infants aged 3 - 12 months, with incidence varying from one country to the other[3]. The classical signs of intussusception include abdominal pain, vomiting, passage of red currant jelly stool and abdominal mass[14]. Manual hydrostatic reduction with normal saline is our method of choice of reduction, with 62.5% success rate in the present study. The reported success rate varies between 19% and 85%, some of the reasons adduced for failure include late presentation of the patients[1] especially in a resource poor environment like ours where patients tend to seek alternate, cheaper form of treatment and only present at the hospital very late; and the lack of expertise of the attending radiologist[1]. Ultrasono-graphy yielded a low diagnostic screening value in a study by Al Malki[14], unlike the 100% in this study. The reduction rate was 62.5% while 37.5% had surgery to complete the reduction previously initiated by the ultrasound guided hydrostatic reduction. The 12.5% recurrence rate of intussusception after reduction in this study agrees with the 10% rate in earlier reports.

Prior to this study all patients with intussusception in our centre had operative reduction, because majority of them presented very late with features of peritonitis, due to financial constraints. Our current

La réduction hydrostatique de l'intussusception sous le guidage de l'ultrason: une expérience initiale dans un pays en voie de développement

Résumé

Arrière-plan: L'intussusception est une des causes les plus fréquentes de l'occlusion intestinale aiguë chez les enfants. La réduction hydrostatique par le lavement baryté est le traitement le plus répandu et le plus utilisé pour l'intussusception non compliquée. Le but de cette étude est de rapporter notre expérience initiale de la réduction hydrostatique de l'intussusception.

Malades et méthodes: Nous présentons notre expérience initiale dans laquelle, au cours de deux ans, 8 malades atteints d'intussusception ont subi une réduction hydrostatique sous le guidage de l'ultrason. Tous les malades qui s'étaient présentés dans les 48 heures suivant le début des symptômes ont été recrutés pour l'étude. Le diagnostic clinique de l'intussusception a été effectué chez tous les malades alors que l'ultrason abdominal a été utilisé pour confirmer le diagnostic. ***Résultats:*** La moitié des malades se sont présentés 24 heures après le début des symptômes. Chez cinq malades (62,5%) l'intussusception a été réduite avec succès alors que trois malades (37,5%) ont subi une réduction incomplète qui a été complétée par la chirurgie. Il y avait un seul cas (12,5%) de réapparition et il n'y avait aucune péritonite. ***Conclusion:*** Dans cet environnement, la réduction hydrostatique de l'intussusception par le guidage à l'ultrason est possible quand les malades se présentent tôt, ce qui réduit le risque de complication et le taux de réapparition. ***Mots-clés:*** Intussusception, réduction

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