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Experience with Sonogram-Guided hydrostatic reduction of Intussusception Children in South-West Nigeria`

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Abstract

Background: Intussusception is a common cause of intestinal obstruction in young children. The diag treatment of intussusception has evolved over the years with ultrasound being the first choice imaging and a major player in the non-operative reduction of intussusception owing to its advantage of reducec and non-exposure to ionizing radiation when compared to other modalities of treatment.

Aim & Objectives: The aim of this study was to evaluate the efficiency of ultrasound guided hydrosta reduction in the management of intussusception in children and assess the predictors of reducibility.

Methods: A prospective study of all infants and children who presented with uncomplicated intussusc conducted between January, 2005 and September, 2013. The diagnosis of intussusception was made cl and this was confirmed by an abdominal ultrasonography. Ultrasound guided hydrostatic reduction of intussusception was performed on the selected patients after they were adequately resuscitated. Failed was abandoned in favour of operative reduction in some patients. Data collected included the age of th duration of symptoms and the outcomes of the procedure and these were analyzed.

Results: Eighty–four patients with intussusception were treated over this period, 36(42.9%) patients w suitable for hydrostatic reduction of intussusception. Twenty-four(66.7%) patients presented within 48 onset of symptoms. Twenty-one(58.3%) patients had successful hydrostatic reduction of intussusceptic (41.7%) patients had failed reduction. The procedure was successful in majority (58%) of the patients age of 1 year and one of the three (33%) patients older than one year. Hydrostatic reduction of intussu was successful in 14 out of 24 patients (58.3%) who presented within 48 hours of onset of symptoms.

Conclusion: Hydrostatic reduction of intussusception under ultrasound guidance is an effective and us conservative method of management in carefully selected children with intussusception. Overall, this r treatment is cost effective and could readily be used for patients in resource poor environment. It also the reduction process and visualizes the components of the intussusception including the lead points.

Keywords: Intussusception, Hydrostatic reduction , Ultrasound guidance, Nigeria , Successful outcon

Introduction

Intussusception is a common abdominal emergency in children and is the most common cause of intes obstruction in early childhood1. Operative and non-operative management procedures have been tried years. Although, surgery is a confident traditional modality, it has its mortality and morbidity due to ir handling of the bowel during attempted manual reduction with serosa and mucosa tears and anesthetic problems2,3. Conversely, non-operative reduction is associated with less patient discomfort, shorter h lower hospital charges, and decreased risk of subsequent complications4 . Surgical treatment, hydrost barium enema reductions have been used for several decades4,5,6, but the advent of fluoroscopy and ultrasonography has popularized the use of newer techniques such as air enema under fluoroscopic gui sonographically guided hydrostatic saline reduction8,9 in the last decades due to less invasion, less co and non-exposure to ionizing radiation10,11,12. These newer techniques of managing intussusception gold standard in many institutions in the developed countries as diagnosis is made early13,14 unlike ir developing countries where diagnosis is made quite late due to late presentation, non-availability of flu and lack of requisite expertise in non-operative reduction of intussusception in most centres15,16. Thi study was conducted to evaluate the efficiency of ultrasound guided hydrostatic reduction using norma the management of intussusception in children and assess the predictors of reducibility at the Universi Hospital, Ibadan, Nigeria.

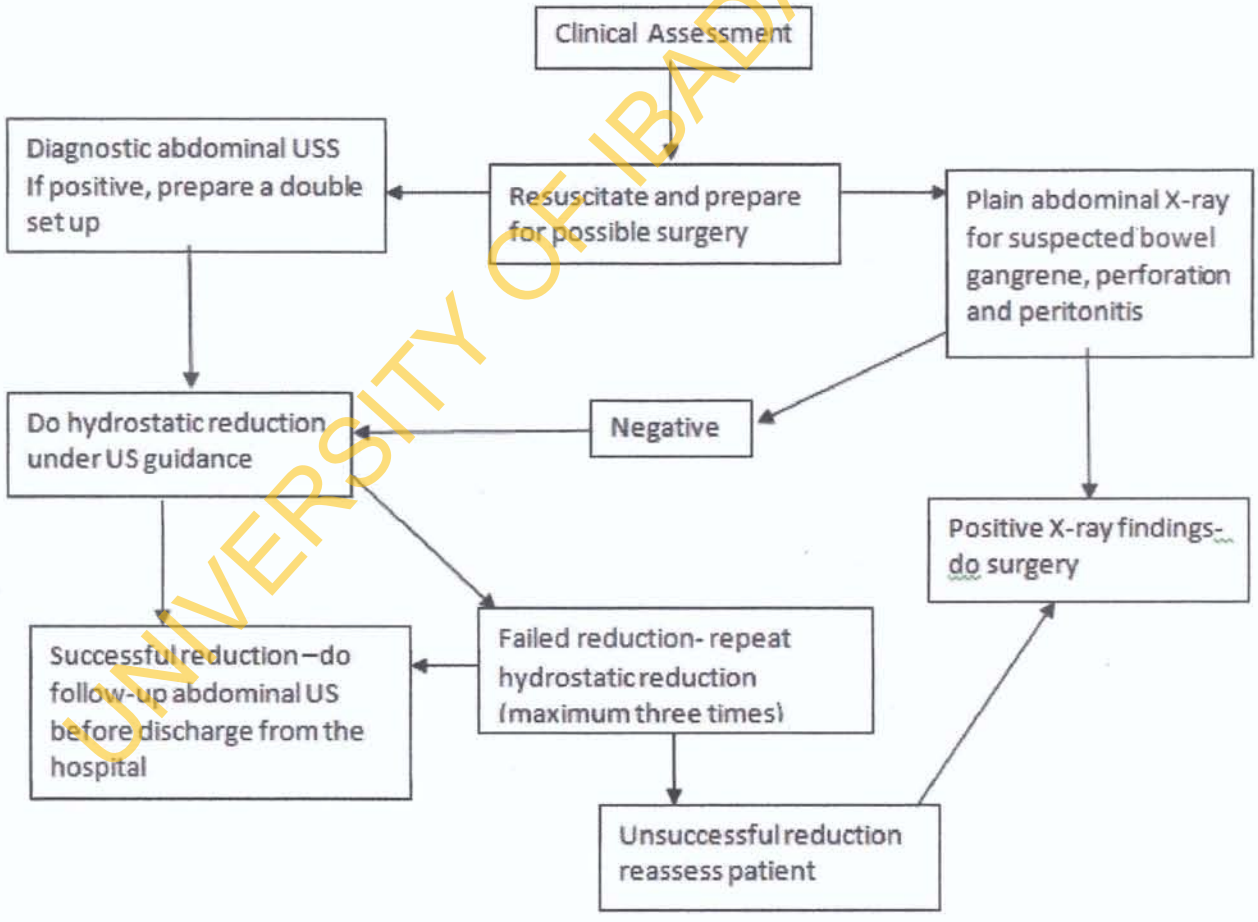
Materials andMethods

A prospective study of children with intussusception managed at the University College Hospital, Ibac was conducted over a 9-year period (January 2005 to September 2013). All the infants and children wl presented with uncomplicated intussusception were included in the study while those presenting with s and signs suggestive of shock, radiologic evidence of free intraperitoneal air suggesting bowel perfora features of peritonitis and younger children below the age of four months were excluded. A treatment as shown in Figure 1 was developed and used for all the patients who presented with uncomplicated intussusceptions to our hospital. The patients were clinically assessed and the diagnosis of intussusceptions made in all of them. This was confirmed by an abdominal ultrasonography. The 36 patients who met t were managed using ultrasound guided saline enema reduction of intussusception after they were adeq resuscitated and stabilized. A double set up was prepared in which selected patients were prepared for and the operating theatre made ready for immediate surgery without delay in the event of a failed enem reduction and/or perforation of the bowel. The procedure was explained to the parent or guardian of th and consent taken both for the ultrasound procedure and for surgery. The procedure was performed in ultrasound room by the radiologist and the surgeon. One of the parents or a guardian the child could tr allowed to be present during the procedure in order to maximize cooperation and gain confidence of th

Ultrasound procedure: using an Aloka SSD 1700 or a Logiq 5 General Electric Ultrasound machine w transducer of 7.5MHz, `an abdominal ultrasound was performed in the transverse and longitudinal pla establish a diagnosis of intussusception and localize the region of the abdomen where the lesion is situ is recognized by the 'dough nut' and 'pseudo kidney' signs. An appropriate sized Foley's catheter was rectum and the balloon inflated and secured in situ. Using a Kamman's syringe (100mls), normal salin carefully and continuously injected through the catheter while maintaining pressure, under ultrasound Reduction was deemed to have been achieved when a free flow of fluid was seen within the bowel anc disappearance of the dough-nut or pseudo kidney sign mass. The catheter was removed after deflating while the excess fluid was spontaneously excreted by the patient.

A nurse monitored the vital sign throughout the duration of the procedure which was performed in the an adult the child could trust (the patient's parents or guardian). After a successful reduction, the patie admitted for follow-up abdominal ultrasound and observation for a period of 48 to 72 hours after whic discharged home for follow up. A reduction of intussusception was deemed to have failed after the prc been repeated three times or when there was bowel perforation. All the cases with failed reduction wer managed surgically.

Figure 1



Algorithm for the management of intussusception in children

Reports

A total of 84 patients with intussusception were treated over this period, 36 patients (42.9%) were fou for ultrasound guided saline enema reduction of intussusception. The age range was 4 to 24 months wi of 5 months as shown in Table I. Over 50% of the patients presented within the first 6 months of life. more males (63.6%) with a male to female ratio of 2:1. Twenty-four (66.7%) patients presented withir hours of onset of symptoms as shown in Table 2. Twenty-one (58.3%) patients had successful saline e reduction of intussusception and 15(41.7%) patients had failed or incomplete reduction with subseque to complete the reduction. Saline enema reduction of intussusception was successful in majority (58% patients under the age of 1 year and in only one of three (33.0%) patients older than one year (p = 0.6(procedure was successful in 14 out of 24 patients (58.3%) who presented within 48 hours of onset of s with a similar success rate recorded in those who presented beyond 2 days of onset of symptoms (p = (5.0%) patient had a recurrence of intussusception for which he had a repeat saline enema reduction w successful. There was no complication recorded in this study after successful ultrasound-guided hydro reduction.

Table 1: Age range and result of saline enema reduction

Table 2: Duration of symptoms and result of saline enema reduction

Discussion

The management of intussusception has evolved universally from the use of hydrostatic reduction thro operative reduction to the use of pneumatic reduction for the acute and uncomplicated cases and surgi reduction for the complicated cases2. However, the process of evolution has been very slow in develo countries, especially in the sub-Saharan Africa, due to lack of requisite facilities and expertise to mana patients non-operatively. Successful reduction rate of intussusception in children is high in both ultras guided (62-94%) and fluoroscopy-guided reduction techniques (90%)6,12,17. However, ultrasound ha advantage of being highly accurate in diagnosing intussusception, monitoring the reduction process as evaluating post-reduction residual intussusception and possible lead points10,17. Another positive fac ultrasound is its widespread use among paediatric institutions but it is the lack of ionizing radiation tha important advantage over all X-ray methods17.

Non-operative reduction of intussusception using normal saline under ultrasound guidance is a proced gained wide acceptance in developing countries like Nigeria and Ghana where it is much cheaper to us ultrasonography to diagnose and reduce intussusceptions than fluoroscopy-guided barium enema or pr reduction18,19.

As observed by Sarin et al[1], a lot of debate exists regarding the best method for diagnosis and treatme intussusception in children as each modality may be helpful considering the set up and experience of t radiology departments as no overall significant difference has been noted between the modalities[6,17,

In this study, most children with intussusception presented late and about 43% satisfied the criteria for operative hydrostatic reduction. Abdominal ultrasonography is routinely used in this centre because of accuracy in the diagnosis of intussusception similar to the reported specificity of 100% and a sensitivit 93%[11,21,22], cheap, devoid of radiation, easy to use and faster as the diagnosis and treatment can be same time. Using the criteria variously suggested in previous studies[1,23–27], 36 out of the 84 (42.9%) treated for intussusception in our hospital were selected for hydrostatic reduction of intussusception w to female ratio of 2:1.

The symptoms of intussusception were non-specific but 16.8% of our patients presented with the class symptoms of intussusception. It has been reported that hydrostatic reduction may not be successful in whose duration of symptoms was more than 48 hours[28–31]. We observed that successful hydrostatic intussusception is independent of the duration of symptoms though the rate of successful reduction dec with increasing age of the patients especially beyond one year. This may be due to higher incidence of in the older children[6, 32–34]. The relationship of successful hydrostatic reduction with increasing age patients was also observed to be similar to previous reports[1,2] as success rate decreased with increasir the patients. The overall success rate of hydrostatic reduction of intussusception in this study was 55.6 to previously reported success rate which ranged from 62% - 94%[17]. The recurrence rate in this study which was similar with the reports of other workers with a range of 5.2% – 20%[35–41]. One patient pr with recurrent intussusception after 5 days of onset of symptoms and this was reduced by saline enema time.

Conclusions

Hydrostatic reduction of intussusception under ultrasound guidance is an effective and useful conserva method of reduction in carefully selected children with intussusceptions. Overall, this modality of trea cost effective and could readily be used for patients in resource poor environment. It also monitors the process and visualizes the components of the intussusception including the lead points.

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