



## RESEARCH ARTICLE

### INTUSSUSCEPTION IN PATIENTS PRESENTING LATE: IS HYDROSTATIC REDUCTION POSSIBLE?

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#### ABSTRACT

**Background:** Many patients with intussusceptions present late to the pediatric surgical department in developing countries. Several authors have described late presentation as a condition for failure of radiologic reduction.

**Methods:** A retrospective review of data collected for all cases of intussusception was analysed with respect to clinical presentation, duration of symptoms and successful attempt at hydrostatic reduction.

**Results:** 22 patients (35%) had reported late beyond 72 hours of being symptomatic. 19 of these patients were subjected to hydrostatic enema reduction which was successful in 17 patients(89%).

**Conclusion:** Delayed presentation is not a predictor of irreducibility in cases of intussusception.

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## INTRODUCTION

One of the most common causes of abdominal pain in infants is intussusception which means telescoping of bowel into itself. Although any part of the bowel is liable to intussuscept, ileo-colic intussusception is by far the most common variety. The disease has been recognized since 1600 for which non operative modes of reduction were preferred till the early 1900s. Around 1900 a shift towards surgical treatment, operative reduction of intussusception, slowly started and the results were better than previous. The operative mortality rate of 38% reported in 1948 again shifted the preference of treatment towards non operative reduction because the mortality was much lower. Without any doubt, the major change in treatment of intussusception has been the increased use of attempts at radiologic reduction. However operative management remains the primary treatment in most of the developing countries due to, either patients presenting late and thus not amenable to radiologic reduction or non-availability of expertise for radiologic reduction during emergency hours. However, stable patients in the absence of any signs of peritonitis can be subjected to radiologic reduction even if they present late. Several reports have been published in the English literature with such types of patients presenting late where the

duration of symptoms of more than 48 hours is considered as late presentation. We have retrospectively studied the cases from a hospital in a developing country with respect to reduction of intussusception amongst patients presenting late considering duration of symptoms for 72 hours or more, as delayed presentation.

## MATERIALS AND METHODS

Medical records of the patients admitted to the department of Pediatric Surgery of IMS & SUM Hospital, Bhubaneswar during April 2012 to March 2016 and discharged with a diagnosis of intussusception were collected. The clinical features of the patients were reviewed. The duration of symptoms, presence of abdominal symptoms, features of rectal bleed and passage of red currant jelly stool, palpable mass on abdomen, per rectal findings and presence of features of peritonitis were noted. Ultra-sonogram abdomen had been done for confirmation of the diagnosis. Patients who were suspected of having peritonitis and ascites were subjected to surgery without attempt for radiologic reduction and were excluded from the study. After resuscitation and consent from parents' radiologic reduction was attempted. Sedation as injectable lorazepam in the dose of 0.1mg/kg body weight was administered to all patients posted for radiologic reduction attempt. A three way foley catheter of size 16 to 18fr was inserted into the rectum of the patient and the balloon inflated

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using up to 30 to 40 cc of air under sonographic guidance. A sphygmomanometer was connected to one way of the foley catheter and slightly pre-warmed normal saline at the other outlet of the foley using intravenous attachment set (Figure -1). The normal saline bottle was kept at a height of 90cm above the patient and the fluid is allowed to flow under gravity. Pressure was maintained and the height of the fluid column was gradually raised maximum up to 120cms for a period of 2 to 3 minutes and the same repeated for maximum of 3 attempts every 10 minutes. Gush of fluid into the small bowel beyond the intussusception with disappearance of the mass was considered successful reduction of the intussusception. During the procedure care was taken to monitor the pressure in the manometer which should remain below the mean arterial pressure of the patient. A delayed repeat enema was tried in clinically stable patients at a gap of approximately 4 hours in patients who had the intussusceptum moved during initial attempt but had not reduced completely. Patient was kept in nil per oral status and the nasogastric tube remained in place overnight. A repeat ultra-sonogram was done to confirm the reduction of the intussusception and exclude any recurrence. The patient was started on oral sips and gradually progressed to full feeds and discharged.

## RESULTS

A total of sixty three patients admitted with the diagnosis of intussusceptions during the period. Twenty two patients presented late i.e. after 72 hours of onset of symptoms.



**Figure 1. Arrangement for pressure monitoring during hydrostatic reduction using three way foley, sphygmomanometer and infusion set**

Radiologic reduction was attempted in nineteen of these patients who did not have any features of peritonitis or ascites. Twelve of these patients were males and the age of the patients

ranged from 9 months to 24 months. All patients had pain abdomen. Features of small bowel obstruction as evidenced by bilious vomiting and /or abdominal distension were present in 9 (47.4%) patients. Red currant jelly stool or rectal bleeding was present in 10 (52.6%) patients. Palpable mass per abdomen was present in 11 (57.9%) patients. Two (10.5%) cases had failure of reduction. Out of these 19 patients one (5.2%) patient required one delayed attempt of reduction. Radiologic reduction of intussusception was successful in 17 out of 19 patients (89.5%).

The patients who had failure of hydrostatic reduction had ileo-ileocolic intussusception in one case and no cause could be attributed in another. One case developed features of peritonitis and pneumoperitoneum on the day following reduction. On exploration there was a tear in the antimesenteric border of the small bowel which was sutured. The patient had an uneventful postoperative recovery. A contingency table was made to look for the association of variables like pain abdomen, red currant jelly stool, small bowel obstruction and mass abdomen with successful or unsuccessful hydrostatic reduction amongst patients presenting late beyond 72 hours. None of the factors have significantly contributed to failure of radiologic reduction in patients presenting late. The result was not significant at  $p > 0.05$ .

## DISCUSSION

Although intussusceptions can occur in all age groups from prenatal to late teens 75% occur within 1st 2 years of life and 40% occur within 3 months to 9 months of age. (Barr 1990). Most series report more males than females with 2:1 to 3:2 ratio, for which no explanation is available. There is a seasonal variation to the incidence which usually correlates with viral infection. The presence of two classic symptoms (abdominal pain, vomiting) and two classic signs (abdominal mass, rectal bleeding) helps make the diagnosis of intussusception in a child (Ein, 1971). The most common classic symptom of paediatric intussusception is sudden onset colicky abdominal pain associated with incessant cry drawing up the legs and lasts for only a few minutes which is present in 85% of cases (Ein, 1971). Abdominal pain was present in all patients in our series. Ravitch and Young found vomiting preceding abdominal pain in 44% of cases. Vomiting tends to occur more in infants than in older children and bilious vomiting secondary to small bowel obstruction tends to occur more in late presenting intussusceptions (Ein, 1981). The presence of a sausage shaped mass in the right hypochondrium was noticed from 22% to 65% of cases in different series (Ein, 1981). Rectal bleeding was present in 43% of cases of intussusception and is usually the last sign to occur (Ein, 1997). Ultrasonography has been reported to have 100% accuracy in the diagnosis of intussusceptions (Pracos, 1987 and Daneman, 1998). Hence abdominal film may be safely omitted in vast majority of patients suspected of having intussusception. The purpose of radiography was to check for complications of prolonged intussusception like intestinal obstruction and perforation. There are no reported cases where pneumoperitoneum was the initial radiographic finding (Sargent, 1994 and Daneman, 1996). Therefore there is a low probability that perforation will be excluded by radiography. Absence of blood flow at the apex of intussusception has been as a sign of irreducibility (Lam, 1992). He *et al.* (He, 2014), has not found any significant difference in successful reduction of intussusceptions and prolonged duration of symptom. In their study they have

considered 24 hours as prolonged duration of symptoms. In our study we have considered 72 hours as prolonged duration of symptoms. Most authors have reported a negative impact of prolonged symptoms on success of radiologic reduction (Kaiser, 2007; Barr, 1990; Stephenson, 1989). Katz *et al* (1993), reported that a duration of symptom longer than 12 hours was a significant predictor of unsuccessful enema reduction and Fike *et al.* (2012) concluded that symptoms lasting for more than 24 hours is a predictor for failure in enema reduction. No study has been conducted considering symptoms for more than 72 hours as delayed presentation. The present study could not find any correlation between delayed presentation and failure at hydrostatic reduction though the sample size is very small of 19 cases only.

## Conclusion

Diagnosis and treatment of intussusceptions is a team work of paediatric surgeon, paediatrician and radiologist. Radiologic reduction of intussusceptions is successful in most of the cases. Prolonged duration of symptoms is not the predictor of irreducibility of intussusception by hydrostatic method. Irreducibility at hydrostatic reduction is the outcome of multiple factors one of which could be delayed presentation and associated vascular compromise of the affected bowel. The compression at the mesenteric vessels and its results may be a cause of irreducibility. Whenever a stable patient is diagnosed of intussusception he/she may be subjected to enema reduction radiologically if no signs of peritonitis, ascites or features suggestive of gangrenous bowel are present.

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