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CHILDHOOD INTUSSUSCEPTION – MANAGEMENT DILEMMA

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ABSTRACT

Intussusception is one of the most common cause of intestinal obstruction in infancy. Modalities of treatment has always been a matter of debate. This shifting paradigm from immediate laprotomy to non operative management has prompted us to undertake this study. Ours is a retrospective analysis of all cases of intussusception diagnosed on ultrasonography in last 10 years (2006-2015). Total 198 children were enrolled in our study with male to female ratio being 1.5:1. There was spontaneous reduction of intussusception in 21% cases. Rest were subjected to barium enema reduction and surgical management. 4% patients showed pathological lead point presenting during late childhood. Due to high incidence(21%) of spontaneous reduction in early diagnosed intussusceptions in our series, its our observation that those cases who present early should be treated conservatively under close observation for 24 hours before child is subjected to invasive procedures like pneumatic or operative reduction.

KEYWORDS: childhood, intussusception, intestinal obstruction, management.

INTRODUCTION

Intussusception was first described by John Hunter in 1793 but first successful operative intervention was performed by Jonathan Hutchinson in 1871.[1] Intussusception is the most common cause of intestinal obstruction in infants and young children between the age of 3 months and 3 years.[2] In intussusception, proximal segment of intestine invaginates into the adjoining distal intestinal lumen causing venous congestion and bowel edema. If not diagnosed and treated early, it can lead to arterial obstruction and bowel necrosis causing gut perforation. The clinical symptoms of intussusception are often non-specific and most patients usually presents with intermittent cramping abdominal pain, vomiting and blood stained stools.[3] The classical triad of red currant jelly stool, abdominal pain, and abdominal mass is often not encountered and the diagnosis may easily be delayed or missed. The first-line and most reliable investigation for diagnosis of intussusception in children is abdominal ultrasound owing to its high sensitivity (98-100%) and specificity (88-100%).[4,5] The treatment modality of intussusception has always been a matter of debate and several patients (approximately 21%) improving spontaneously as in our series has raised questions on the promptness of starting the invasive procedure. Pneumatic reduction is currently the preferred standard treatment, except in those patients who present with abdominal lump, bilious vomiting and red currant jelly stools.

MATERIAL AND METHODS

We conducted a retrospective study of children who presented with intussusception from January 2006 to December 2015 in our hospital. Patient demographics, clinical presentation, duration of symptoms, treatment modalities, complication rate, and length of hospital stay were studied. The method of non-operative reduction in our institution was barium enema which was diagnostic and therapeutic. Successful reduction was demonstrated by free flow of air into the terminal ileum. In open reduction, manual reduction was achieved by milking the intussusceptum out of the intussuscipient. Bowel resection was performed in irreducible cases where bowel was found gangrenous and necrotic.

RESULTS

A total of 198 children (118 males, 80 females) presented to our hospital with intussusception during the study period. Infancy was the most common age group involved accounting for 81% of the total patients (Chart 1). The most common symptom reported was vomiting with excessive crying and occurred in 170 (86%) patients. Of them, 36 (18%) cases presented within 6-12 hours of onset of symptoms. Abdominal lump was

palpable in approximately 67% of patients. Red currant jelly stools were present eventually in 100% of patients. In 4 patients intussusception was palpable per rectally and even 2 patients showed prolapse of intussusception through anal opening. All the patients were subjected to USG abdomen and X-ray abdomen. Diagnosis was made by USG in all the patients.

All the patients were initially kept NPO, IV fluids and antibiotics were given and were observed closely for improvement or deterioration of clinical status. Total of 40 patients (21%) improved spontaneously within 24 hours on conservative approach which was evident on clinical examination by passage of flatus and greenish stool. 22 patients were subjected to Ba enema which proved to be therapeutic in 45%. Classical "claw sign" was evident on Ba enema (Figure 1).

Indications of operative intervention were late presentation, lump abdomen, red currant jelly stool, bilious vomiting, X-ray abdomen showing multiple air fluid levels and failure of barium enema reduction. Abdomen was opened through right supraumblical muscle cutting transverse incision. Ileo colic intussuscetion was the commonest variant. Intussusception was identified and was reducible in 64% cases and irreducible in 36% cases where resection and ileo colic anastomosis was done (Chart 2). Presence of pathological lead point was evident in late childhood with 5 patients having meckel's diverticulum as lead point and in 2 patients with jejunojejunal intussusception, adenomatous polyp was found to be the lead point. One patient of colo-colic intussusception had hamartomatous polyp as leading point presenting with profuse rectal bleeding. Post operative intussusception was observed in 4 cases of which 2 cases were operated for congenital diaphragmatic hernia and 2 patients underwent laprotomy for some other reason. Three cases had recurrent intussusception. One case also had retrograde jejuno-jejunal intussusception. Intraoperative perforation occurred during reduction in 10 cases of irreducible intussusception. After surgery, abdomen was closed in layers. Patients were kept NPO with continuation of IV fluids and antibiotics. Patients with irreducible intussusception were managed by resection and anastomosis (Figure 2).

Patients were started orally once they passed stools and flatus. Patients were discharged on 10th post-operative day. Postoperative mortality was found in 3 cases who presented late in severe sepsis and dehydration.

Figure 1. Barium enema showing classical claw sign
Figure 2. Photograph showing resected gangrenous ileo colic segment
Chart 1. Age distribution of the cohort
Chart 2. Plan of management
Chart 3. Distribution of patients according to duration of symptoms

Charts

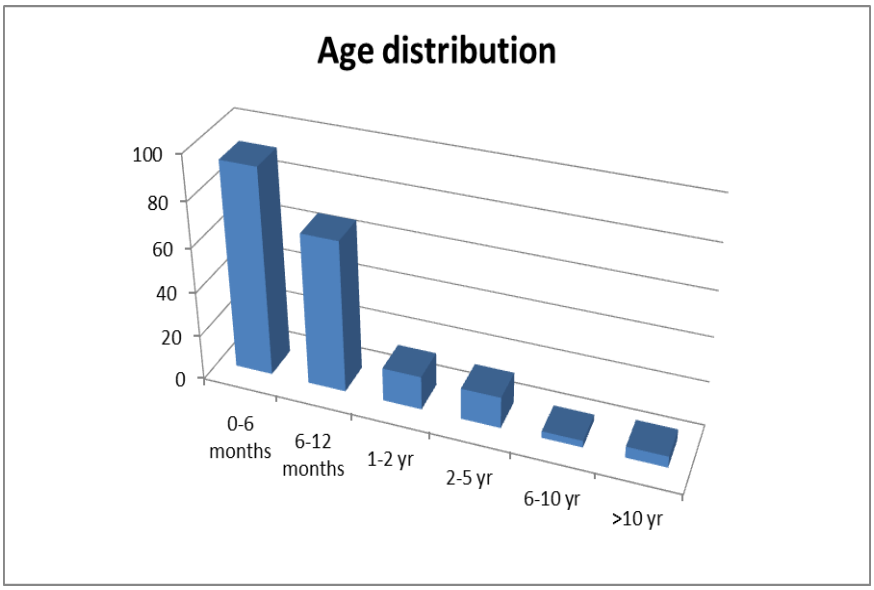

Chart 1. Age distribution of the cohort

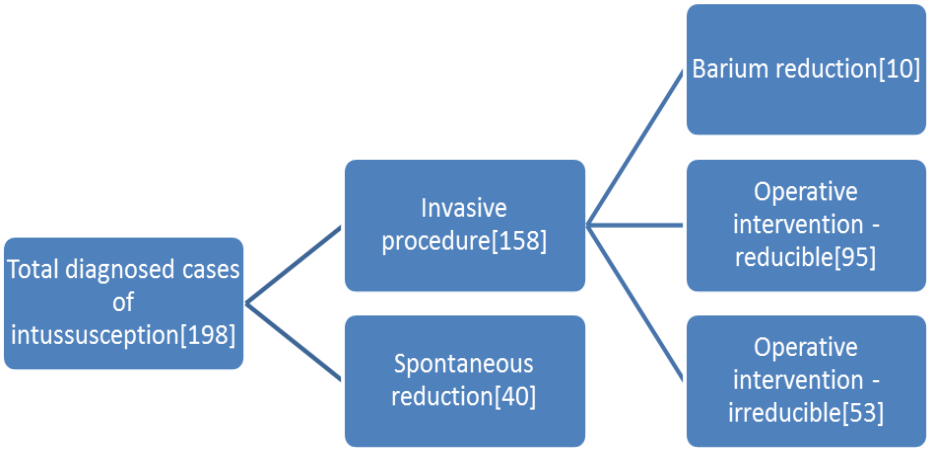

Chart 2. Plan of management

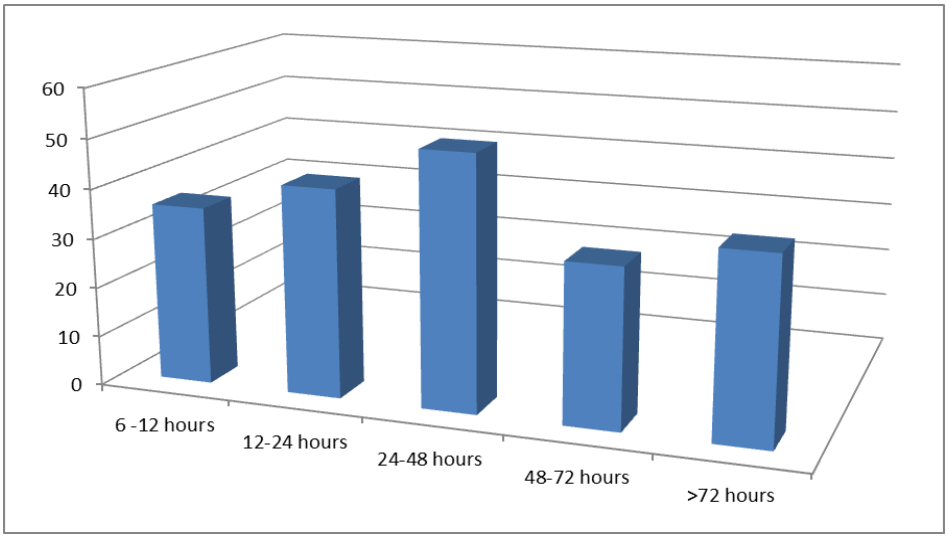

Chart 3. Distribution of patients according to duration of symptoms

FIGURES

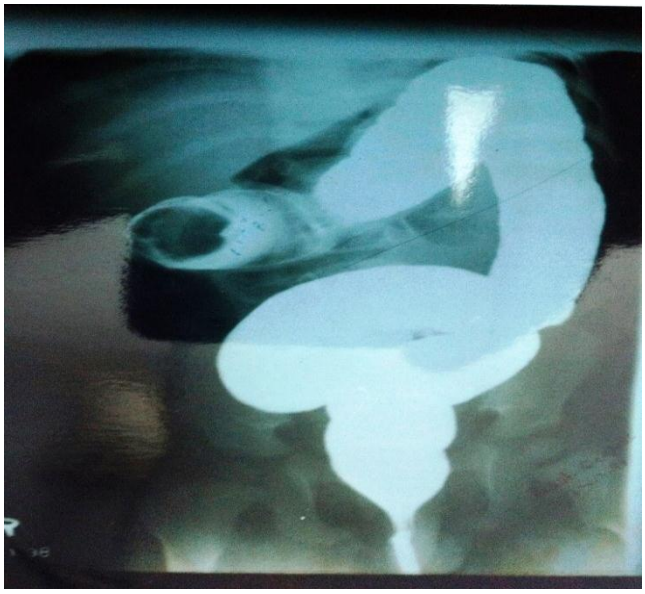

FIGURE 1. Barium enema showing classical claw sign

FIGURE 2. Photograph showing resected gangrenous ileo colic segment

DISCUSSION

Intussusception is most common surgical emergency among children under 2 years of age[6,7,8] with less than 25% of cases occurring beyond infancy.[8] In our study, only 20% of patients were above infancy. Intussusception has a male predominance with a male to female ratio of 4:1.[7] In accordance to the mentioned data, our overall sex ratio for the illness hovers around 1.4:1 while in infancy it was approximately 3.1:1. Intussusception in the paediatric age-group are mostly ileocolic and idiopathic[9] probably caused by hyperplasia of lymphoid tissue in terminal ileum which may be the 'lead point' in its pathogenesis.[10] Under the age of 2 years, lead points occur in less than 4% cases, after which lead point is seen in approximately one third of the patients.[10] In our study, only two infants were found to have meckel's diverticulum as lead point while every fifth child beyond infancy had one or the other lead point.[11] In several recent studies conducted on surveillance of intussusception, rotavirus vaccine is implicated to be one of the very important cause but further study is warranted to make final conclusion.[12,13] Jejuno jejunal intussusception was associated with adenomatous polyp as lead point in both cases. Colo-colic intussusception had hamartomatous polyp as lead point in one case. Retrograde jejuno jejunal intussusception was seen in 1 case.[14] The classical triad of intermittent abdominal pain, palpable abdominal mass and red currant jelly stools is not a common presentation.[15] But in our cohort, as most of the children presented late (beyond 24 hours) (Chart 3), 60% of them were documented to have the presence of all the three symptoms at the time of hospital admission. Early presentation is usually with pain abdomen and red currant jelly stools. In accordance with previous studies, vomiting was the most common presenting symptom.[10,16] Red currant jelly stool considered to be a sign of gut edema, mucosal sloughing and bowel ischemia was present in two third of our patients.

USG abdomen was used as first line of investigation to make diagnosis and was found to be fruitful in all the cases. This was in line with findings of Pracos et al who reported 100% accuracy of USG in making diagnosis.[17] USG signs include "Target sign", "pseudokidney sign" and "cresent in a doughnut sign". When child presents late, plain radiographs may show sign of bowel obstruction like multiple air fluid levels in distal bowel. However normal abdominal X-ray does not exclude intussusception in early presentation. When ultrasonography findings are non specific and inconclusive, Barium enema showing "coiled spring" sign or "claw sign" can be diagnostic (Figure 1). This method has therapeutic implications also but associated morbidities limits its use in day to day practice. Computed tomography is seldom needed for diagnosis of paediatric intussusception. Unlike previous studies,[18,19,20,21] all diagnosed patients of intussusception who presented early were managed conservatively for 12-24 hours. 21% of children improved spontaneously in our cohort indicated by passage of bilious stools and flatus and disappearance of pain. Those children who didn't improve spontaneously within 24 hours or started to deteriorate clinically with fresh appearance of red currant jelly stools, abdominal mass, unstable hemodynamic status were subjected to non operative or operative intervention. It is general consensus to attempt non operative methods in most of the patients. Non operative methods include Barium enema, saline reduction and pneumatic reduction under flouroscopy. A study by Omar Bin Hasan et al reveals that only 4 children out of 50 improved spontaneously while 84% showed improvement on pneumatic reduction.[22] Barium enema reduction is the oldest non operative method[21] while pneumatic reduction came in picture in 80's and

quickly became the method of choice due to its ease of performance, less complication rate and better outcome. Although the perforation rate with both methods are very less but lesser morbidity with air contrast enema clearly outweighs it. Reduction success rate with pneumatic reduction (81-91%) is much better than enema reduction (50-85%) making it the procedure of choice.[22,23] Recurrence rate is 5 - 7% following hydrostatic or surgical methods.

Indications of surgical intervention included bilious vomiting, lump abdomen, X-ray abdomen showing multiple air fluid levels with ultrasound confirmation and failed non operative methods.[24,25] All these cases were subjected to open surgery. Although in some centres, laproscopic reduction of uncomplicated intussusception is done. In a series by Carol W Y Wong, 62.5% of cases required conversion from laproscopic to open reduction due to need for bowel resection.[26] In our series, 64% of cases were reducible and rest were irreducible and so were subjected to resection.[27,28] Post operative mortality in our series was 1.5% owing to severe sepsis and shock in these patients. In a study by Stringer et al,[3] mortality was less than 1%.[3] Post operative adhesions were seen in 6 patients (3%) while recurrence was observed in 1.5% of patients on follow up in comparison to a study conducted by Difiore JW where post operative adhesions were seen in between 3 to 6% of patients while recurrence was evident in 5-10% after non operative procedure and 1-4% following operative procedure.[10]

CONCLUSION

Due to high incidence (21%) of spontaneous reduction in early diagnosed intussusceptions in our series, its our observation that those cases who present early should be treated conservatively under close observation for 24 hours before the child is subjected to invasive procedures like pneumatic or operative reduction.

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