

## **Management of Intussusception: Changing Trends**

**SATISH KUMAR AGGARWAL**

*From the Department of Pediatric Surgery, Sir Ganga Ram Hospital, New Delhi, India.  
satish.childurology@gmail.com*

**I**ntussusception is one of the most common surgical emergencies in the age group of 6 months to 3 years. Almost half of all the cases present between the ages of 6 and 12 months, and over 90% present within the first three years. Most cases are of ileo-colic variety caused by reactive hyperplasia of Peyer's patches in the terminal ileum in response to upper respiratory or gastrointestinal infections. Small bowel intussusceptions such as jejuno-jejunal or ileo-ileal are usually transient and inconsequential. Secondary intussusception occurs when there is a pre-existing lesion in the gut that may act as a lead point.

The clinical features of intussusception are very characteristic and every pediatrician must be able to suspect the diagnosis in a child presenting with intermittent colicky abdominal pain with drawing up of legs, poor feeding, vomiting and per rectal passage of blood mixed with mucus. Late presentation may be with abdominal distension, bilious vomiting resulting from frank small bowel obstruction, and dehydration. Examination may or may not show a typical sausage-shaped mass around the umbilicus. A plain X-ray demonstrates features of small bowel obstruction – a cut-off of intestinal gas may be an early feature but not always appreciable. Ultrasound is the key modality in modern times to diagnose and also help in treatment. A 'target' or 'doughnut' sign is the key sonographic feature. Doppler ultrasound should also be used to assess the vascularity of the intussuscepted gut.

The management of intussusception has witnessed a paradigm shift in recent times. With better societal awareness and better access to healthcare facilities, more children are picked up early. Further, with easy availability and low cost of ultrasound coupled with the current trend towards defensive and investigation-driven medicine, the suspected cases are subjected to ultrasound examination more frequently leading to an early diagnosis. While late presentation and therefore need for laparotomy and resection was quite common about 25 years ago, in my experience, the percentage of laparotomies for intussusception has significantly gone down now.

Ultrasound-guided saline reduction is the currently favored treatment modality in uncomplicated intussusception. Although the use of enemas for treatment of intussusception is more than a century old, it was a very crude approach with no control on pressure and no radiological guidance. It was entirely guided by the physician's judgement and palpation. Then came an era of Barium enema reduction under fluoroscopic guidance. This was associated with high radiation dose and risk of Barium peritonitis if perforation occurred. Barium peritonitis is one of the most difficult conditions to treat because it causes intense chemical reaction resulting in extensive inflammation and adhesions. Therefore, Barium enema reduction has become largely obsolete in the current era. Air enema under X-ray guidance has been used successfully but involves radiation exposure. During the late eighties and early nineties, there were several reports of radiological guidance for reduction by air or Barium enema [1-3]. The use of ultrasound-guided saline reduction was first reported from Korea by Kim, *et al.* [4] in 1982, and since then it gained wide popularity for its safety, easy availability, no radiation exposure and low cost. However, the basic principles of management remain the same. Every child must be clinically assessed for dehydration, peritonitis and intestinal obstruction. Intravenous fluids and antibiotics to cover gram-negative enteric organisms and anaerobes must be started, and adequate pain relief should be provided. Hydrostatic reduction should be done preferably in operation theater (OT) under sedation or anesthesia. In case of perforation, immediate laparotomy should be carried out. Peritonitis, advanced intestinal obstruction and delayed presentation (beyond 24-48 hours) are the usual contraindications for hydrostatic reduction.

In the context of contemporary clinical practice, the study [5] reported by Kerala group in this issue of *Indian Pediatrics* brings forward certain interesting observations. Through a retrospective analysis of 375 cases from a Southern state of India, authors have concluded that duration of symptoms, age at presentation and recurrence

after hydrostatic reduction are no contraindication to non-operative management. Non-operative treatment was successful in over 90% of their cases, and most of them presented within 24 hours of onset of symptoms. This is understandable and reflective of better access to health care and responsible societal behavior in seeking timely medical attention. A recent report from Turkey [6] also shows high success rate with hydrostatic reduction in cases with relatively late presentation.

Another interesting aspect in this study [5] is the success of hydrostatic reduction in recurrences, even after third and fourth recurrence. Although the recent report from Turkey [6] supports these observations, caution should be exercised in dealing with second recurrence and beyond because these cases are likely to have a lead point, especially when they present beyond infancy; and therefore, there should be low threshold for surgery. Seventeen cases in this series [5] required operative intervention following recurrence, and 10 of them had significant finding that would have warranted resection.

Yet another observation in the current series [5] is a higher age at presentation, which may be a reflection of regional variation in infant feeding practices or climate differences but it is difficult to pin-point the exact reason. It is likely that authors have included the cases of entero-enteric self-limiting intussusceptions also in their series. A significant number (60) in their series have had spontaneous reduction without any intervention. Whether they were ileo-colic or jejuno-jejunal/ileal has not been specified. Generally, one would not wait for spontaneous reduction once the diagnosis of ileo-colic intussusception is confirmed. However, jejuno-jejunal/ileal ones are likely to reduce by themselves. They may even be seen in an otherwise asymptomatic child undergoing ultrasound examination for unrelated indication, and in post-operative patients.

Hydrostatic reduction under ultrasound guidance is certainly the modality of choice for non-operative management of ileo-colic intussusception, and as the authors have pointed out, it should be carried out in a tertiary-care setting, on a well resuscitated patient and with the OT in readiness. Primary operative intervention should be reserved for cases who present with frank peritonitis, suspected ischemic gut, shock and severe intestinal obstruction. Out of 375 patients in this series [5], only 11 required primary surgery. This is probably a reflection of the regional variation in societal practice of seeking medical attention early. In many Indian states, more patients present late when they already have peritonitis, and are candidates for surgery straightaway. The bottomline should be clinical judgement. One should

not be very dogmatic about the duration of symptoms. I would consider a gentle attempt at hydrostatic reduction even after 48-72 hours provided the following conditions are met: (i) the child is clinically stable, well resuscitated, and not in intestinal obstruction; (ii) the reduction is carried out in the OT, so that immediate laparotomy can be carried out in case of complications; (iii) not more than two attempts are given at reduction at an interval of 10 minutes; and (iv) pressure of reduction should not exceed 90 cm of water.

If the criteria for non-operative intervention are not met or if there is a complication of hydrostatic reduction, the patient should be considered for surgery. The traditional approach has been to do a laparotomy. It may be possible to reduce the intussusception, but resection may also be required. Experience in using laparoscopy-assisted reduction as an alternative to laparotomy is also accumulating [7-9]. However, one should be careful in selecting cases for laparoscopy. Patients presenting with advanced obstruction and severely distended abdomen, and those encountering complications of hydrostatic reduction are best managed by a laparotomy.

*Funding:* None; *Competing interest:* None stated.

#### REFERENCES

1. Guo J, Ma X, Zhou Q. Results of air pressure enema reduction of intussusception: 6369 cases in 13 years. *J Pediatr Surg.* 1986;21:1201-3.
2. Jinzhe Z, Yenxia W, Linchi W. Rectal insufflation reduction of intussusception in infants. *J Pediatr Surg.* 1986;21:30-2.
3. Katz ME, Kohn P. Intussusception reduction 1991: An international survey of Pediatric radiologists. *Pediatr Radiol.* 1992;22:322-5.
4. Kim YG, Choi BI, Yeon KM, Kim JW. Diagnosis and treatment of childhood intussusception using real time ultrasonography and saline enema: preliminary report. *J Korean Soc Med Ultrasound.* 1982;1:66-70.
5. Simon NM, Joseph J, Philip RR, Sukumaran TU, Philip R. Intussusception: single center experience of 10 years. *Indian Pediatr.* 2019;56:29-32.
6. Avci V, Agengin K, Bilici S. Ultrasound guided reduction of intussusception with saline and evaluating the factors affecting the success of the procedure. *Iran J Pediatr.* 2018; 28:e62442.
7. Chandrasekharam VV, Gazula S, Gorthi RP. Laparoscopic-assisted hydrostatic *in situ* reduction of intussusceptions: A reasonable alternative? *J Indian Assoc Pediatr Surg.* 2011;16:8-10.
8. Apelt N, Featherstone N, Giuliani S. Laparoscopic treatment of intussusception in children: a systematic review. *J Pediatr Surg.* 2013;48:1789-93.
9. Wei CH, Fu YW, Wang NL, Du YC, Sheu JC. Laparoscopy versus open surgery in idiopathic intussusception in children. *Surg Endosc.* 2015;29:668-72.