



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**RETROGRADE INTUSSUSCEPTION FOLLOWING ROUX-EN-Y ANASTOMOSIS - A RARE CASE REPORT**

**KEY WORDS:**

Intussusception, retrograde, lead point, choledochal cyst, proximal / distal bowel

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**ABSTRACT**

Intussusception occurs when one portion of the gut invaginates into an immediately adjacent segment; almost invariably, it is the proximal into the distal. This condition is most commonly encountered in children, with a peak incidence between 5 and 10 months of age. About 90% of cases are idiopathic but a pathological lead point such as Meckel's diverticulum, polyp, intestinal duplication, submucosal lipoma, etc. is found in at least one-third of affected children after the age of 2 years. In patients who have undergone a Roux-en-Y anastomosis, an atypical form of intussusception has been increasingly described where the distal bowel is drawn in to the lumen of the proximal bowel (Retrograde Intussusception). We hereby report a rare case of Retrograde Intussusception in an adolescent girl presenting as a late complication of Roux-en-y HepaticoJejunostomy done following Choledochal cyst excision in her childhood.

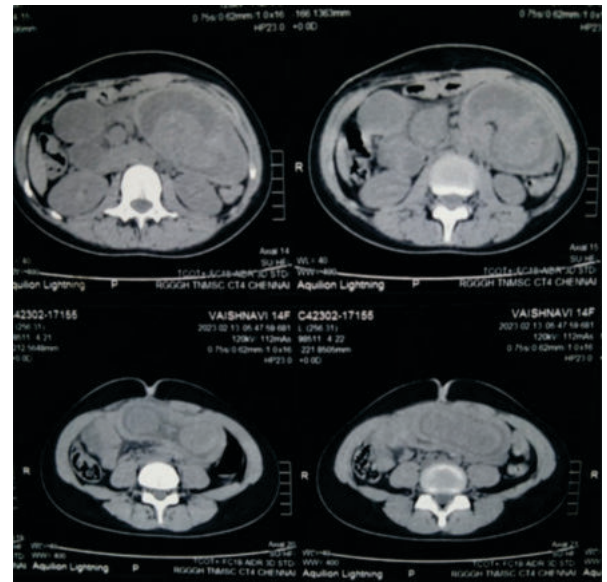
**INTRODUCTION**

Intussusception refers to telescoping of the proximal bowel segment into the lumen of the distal bowel segment. It is usually idiopathic, without an obvious anatomic lead point, and occurs predominantly at the ileocecal junction, where there is marked swelling of the lymphoid tissue in the region of the ileocecal valve. The occurrence of intussusception is associated with a history of recent episodes of viral gastroenteritis, upper respiratory infections, and even administration of the rotavirus vaccine, implicating lymphoid swelling in the pathogenesis of intussusception. In older children, the incidence of a pathologic lead point is up to 12%, and Meckel's diverticulum is found to be the most common lead point for intussusception. However, other causes, such as intestinal polyps, an inflamed appendix, submucosal hemorrhage associated with Henoch-Schönlein purpura, a foreign body, ectopic pancreatic or gastric tissue, and intestinal duplication, must also be considered. Postoperative small bowel intussusception in the absence of a lead point can occur in up to 5% of all paediatric cases of intussusception. A peculiar form of Intussusception known as the Retrograde Intussusception, is an extremely rare condition characterized by invagination of distal bowel into the lumen of proximal bowel. These intussusceptions are usually not associated with a lead point and may represent a motility disorder of the bowel following the Roux-en-Y reconstruction. The main ideology behind reporting this case is the rarity of its presentation in the given clinical setting.

**CASEREPORT**

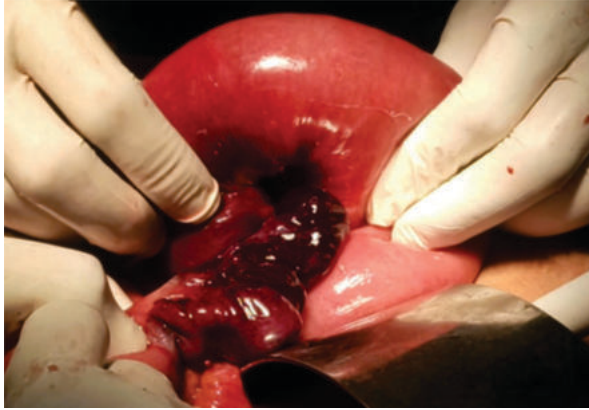
This case report is all about a 14 years old adolescent girl who presented to the ED with complaints of acute abdominal pain, predominantly around the umbilical region for 2 days. She had two episodes of non bilious vomiting with history of fever for the past 3 days. The girl had a previous surgical history wherein she underwent Choledochal cyst excision with Roux-en-Y Hepatico-Jejunostomy for Type I Choledochal cyst at 4 years of age. On admission, the patient's general condition was fair with stable vitals except for tachycardia. On examination, a vague mass was felt over the infraumbilical region. There was tenderness on palpation with localised guarding. Rectum was collapsed & faecal staining was present on per rectal examination. Ultrasound Abdomen & Pelvis was done that revealed a sausage shaped mass in the infra-

umbilical region showing bowel in bowel appearance, suggestive of Intussusception. CECT Abdomen was done, demonstrating the classical 'Target Sign' appearance (Fig. 1) & reasserted the diagnosis of Intussusception causing bowel obstruction with upstream dilatation of proximal bowel loops till the Hepatico-Jejunostomy site.

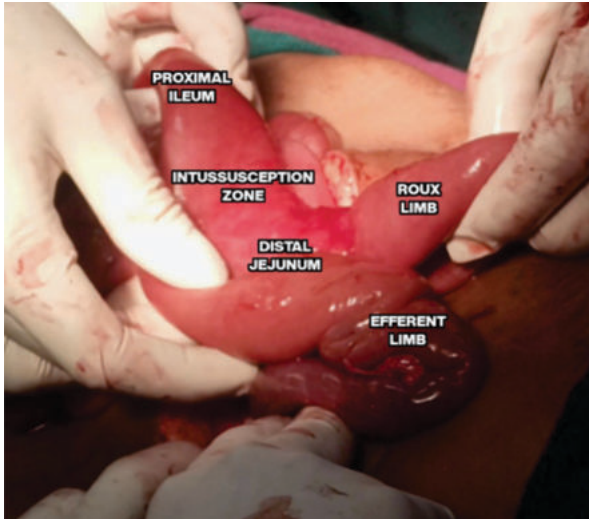


**Figure 1: Preop CECT Abdomen Showing 'target Sign'**

It was decided to proceed with Diagnostic Laparoscopy. Intraoperatively, a firm mass of Intussusception involving small bowel loops with upstream dilatation of proximal bowel loops ( both the Roux limb & the efferent limb ) was noted with completely collapsed distal loops. Initially, Laparoscopic reduction was attempted. However, once a segment of Intussusceptum was noticed to be unviable, it was converted to open laparotomy & proceeded further. The Intussusception mass (Fig. 2) was pretty close to the Roux-en-Y limb (Fig.3 ) proximally and about 120 cms from the IC junction distally. By gentle manipulation, the mass was reduced completely and the bowel loops were examined carefully for viability.



**Figure 2 : Intraop Picture Showing Intussusception Mass**



**Figure 3 : Intraop Picture Showing Afferent & Efferent Limbs**

About 30 cm of the small bowel loops ( i.e. the Proximal Ileum ) which is the distal segment here, that was invaginating into the lumen of proximal segment ( i.e. the Distal Jejunum ) was confirmed to be non-viable (Fig. 4). No obvious lead point was noted except for a small constriction rim at proximal ileum. Hence, it was decided to proceed with resection of gangrenous segment with adequate margins on either side followed by Jeuno-Ileal anastomosis. Post operatively, the patient was monitored in intensive care unit. She recovered well and was started on diet by 5<sup>th</sup> POD & discharged by 10<sup>th</sup> POD. The resected bowel segment was subjected to histopathological examination to rule out any pathology. It was reported to show features of acute vascular insufficiency alongside transmural haemorrhagic infarction, consistent with gangrenous changes following strangulation. The patient was advised for monthly followup for the first three months and she was doing fine until last visit.



**Figure 4 : Intraop Picture Showing Non Viable Bowel After Complete Reduction**

**DISCUSSION**

Intussusception is usually composed of three parts -

- The Entering or Inner tube (Intussusceptum) } Proximal Ileum
- The Returning or Middle tube } Ileum
- The Sheath or Outer tube (Intussusciptiens) - Distal Jejunum

In most children, the intussusception is ileocolic whereas in adults, colocolic intussusception is more common. Ultrasonogram of Abdomen has a high diagnostic sensitivity in children, demonstrating the typical doughnut appearance of concentric rings in transverse section. However, CT scan is currently considered as the investigation of choice as it is the most sensitive radiological modality to confirm intussusception. In paediatric population, Hydrostatic reduction by enema using contrast material or air is the therapeutic procedure of choice. However, an intussusception located entirely within the small intestine is unlikely to be reduced by an enema and more likely to have an associated lead point. The operative indications for intussusception include: peritonitis, bowel obstruction at initial presentation (as in our case), failed hydrostatic enema reduction, or multiple recurrences. Bowel resection is required occasionally when the intussusception cannot be reduced, the viability of the bowel is uncertain, or a lead point is identified. Recurrence rates are extremely low after surgical reduction. Laparoscopic reduction of an intussusception has recently gained popularity with variable success rates. Choledochal cyst refers to congenital dilatation of the bile duct. It is a congenital disease commonly seen in children less than 10 years of age often requiring surgical repair thereby having a relatively longer postoperative follow up period. Choledochal cysts are believed to occur because of an abnormal biliary & pancreatic duct junction and thus its treatment entails cyst excision and biliary reconstruction, involving a hepaticojejunostomy with a 30 to 50 cm Roux limb. Several complications may occur during follow-up of paediatric patients post-choledochal cyst repair, some of which require urgent surgical intervention. Intestinal obstruction is an important complication following surgical repair of a choledochal cyst and thus retrograde jejunal intussusception or obstruction might occur following Roux-en-Y reconstruction. Some patients who have undergone the Roux-en-Y anastomosis develop a syndrome of upper gut stasis, which has been termed as the Roux Stasis Syndrome (RSS). The etiology of RSS has been postulated to be electrical & motor abnormalities in the Roux limb. Separation of the Roux limb from the small intestinal pacemaker, which is located in the duodenum, allows ectopic pacemakers to arise in the Roux limb that drives the contraction of the proximal limb in reverse direction, ultimately resulting in Retrograde Intussusception, which is considered to be an extreme form of the RSS. Once the diagnosis of retrograde intussusception is established, it is managed just like any other case of intussusception, however requiring more operative interventions than the conventional type.

**CONCLUSION**

Retrograde Intussusception presenting as a late complication of Roux-en-Y Hepaticojejunostomy post Choledochal cyst excision is an extremely rare entity. Surgeons should be aware of this atypical condition. Eliciting a detailed clinical history coupled with thorough physical examination & meticulous inspection of radiological films can enhance early preoperative diagnosis and prompt towards timely surgical intervention thereby reducing the morbidity and the mortality of the patient.

**REFERENCES**

1. Shieh, CS., Chuang, JH. & Huang, SC. Retrograde intussusception after Roux-en-Y hepaticojejunostomy for choledochal cyst. *Pediatr Surg Int* 10, 398-399 (1995). <https://doi.org/10.1007/BF00182238>
2. Hosokawa, T., Hosokawa, M., Shibuki, S., Tanami, Y., Sato, Y., Ishimaru, T., ... Oguma, E. (2021). Role of ultrasound in follow-up after choledochal cyst surgery. *Journal of Medical Ultrasonics*, 48(1), 21-29. doi:10.1007/s10396-020-01073-z

3. Mukai, M., Kaji, T., Masuya, R. et al. Long-term outcomes of surgery for choledochal cysts: a single-institution study focusing on follow-up and late complications. *Surg Today* 48, 835–840 (2018). <https://doi.org/10.1007/s00595-018-1660-9>
4. Yalçın S, Karnak I, Ciftçi AO, et al. Postoperative intussusception in children: a keen diagnosis in postoperative ileus. *Turk J Pediatr.* 2012;54:403–8.
5. Christopher L Kalmar , Tananchai A Lucktong, Laparoscopic enteropexy for intussusception at Roux-en-Y anastomosis. *Journal of Surgical Case Reports*, Volume 2019, Issue 5, May 2019, rjz152, <https://doi.org/10.1093/jscr/rjz152>
6. SABISTON TEXTBOOK OF SURGERY - THE BIOLOGICAL BASIS OF MODERN SURGICAL PRACTICE ( 21<sup>st</sup> Edition ) Chapter 67 : Pediatric Surgery - Dai H. Chung
7. SCHWARTZ's PRINCIPLES OF SURGERY ( 11<sup>th</sup> Edition ) Chapter 28 : Small Intestine - Ali Tavakkoli, Stanley W. Ashley, and Michael J. Zinner
8. BAILEY & LOVE's SHORT PRACTICE OF SURGERY ( 28th Edition ) Chapter 78 : Intestinal Obstruction - P. Ronan O'Connell , Andrew W. McCaskie and Robert D. Sayers