

Two Episodes of Retrograde Jejuno gastric and Jejunojejunal Intussusceptions as a Complication of Gastrostomy Tube in a Child: A Case Report

Sakulsansern Kwanhathai MD¹, Tunruttanakul Suppadech MD², Ruangwattanapaisarn Nichanan MD³, and Sritippho Nopporn MD⁴

¹Division of Pediatric Surgery, Department of Surgery, Sawan Pracharak Hospital, Nakhon Sawan, Thailand.

²Division of General Surgery, Department of Surgery, Sawan Pracharak Hospital, Nakhon Sawan, Thailand.

³Department of Diagnostic and Therapeutic Radiology, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand.

⁴Division of Pediatric Surgery, Department of Surgery, Sawan Pracharak Hospital, Nakhon Sawan, Thailand.

*Correspondence:

Sritippho Nopporn, Division of Pediatric Surgery, Department of Surgery, Sawan Pracharak Hospital, Nakhon Sawan, 60000, Thailand, Tel: (66)56 219-888; Fax: (66)56 219-899; E-mail: sritippo4644@gmail.com.

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ABSTRACT

Gastrostomy tubes are frequently used to provide enteral access in some pediatric patients. Serious long-term complications are rare. The case-report here is a 12 years-old neurologically impaired child who had gastrostomy done for pharyngeal incoordination, presented eight years later with intestinal obstruction and upper gastrointestinal bleeding. Various imaging modalities were utilized and showed a retrograde jejuno-gastric intussusception around the gastrostomy tube. Six days after laparotomy and manual reduction, a perforated recurrent jejuno-jejunal intussusception occurred. Series of subsequent interventions were followed. This report aims to raise awareness of this uncommon but potential lethal complication concurrently with a discussion on diagnosis and management. We also provided a set of associated and useful imaging which is the important diagnostic tool.

Keywords

Intussusception, Retrograde jejuno gastric intussusception, Gastrostomy tube.

Introduction

Gastrostomy tubes are frequently used to provide enteral access in many pediatric conditions, such as pharyngeal incoordination, neurologic disorders, chronic malnutrition, or other surgical and traumatic etiologies. Long-term complications are usually minor and include ulceration of surrounding skin, clogging of the feeding tube, and inadvertent dislodgment. Severe or life-threatening long-term complications are rare [1].

The first case of intussusception secondary to a gastrostomy tube was a two years old child reported by Haws et al. in 1996 [4]. The intussusception involved entire duodenum, jejunum and most of the ileum [4].

Jejunogastric intussusception is the event which jejunum serves as the intussusceptum, and stomach is the intussusciens. Three following case-report further demonstrated infants and children who developed bowel obstruction secondary to intussusception with a gastrostomy feeding tube as the leading point [2-4].

We present a rare but life-threatening complication from a long-term indwelling of gastrostomy tube. Furthermore, to our knowledge, there has never been a case suffered from early recurrent episodes.

Case Report

Patient and History

A twelve years old boy with neurological impairment secondary to birth asphyxia had undergone gastrostomy for pharyngeal incoordination at the age of four years. He presented with bilious vomiting and history of coffee ground emesis for one day prior to admission. The parent also recognized that there was some amount

of bile came out from the tube and leaked around it. Patient once had a history of the tube migration into stomach and pulmonary aspiration.

On physical examination, the child was drowsy, tachypnea and mild dehydrated. The abdomen was scaphoid. Clinically, we suspected gastric outlet obstruction secondary to migrated tube and aspiration pneumonia. We revised the tube tip position expecting to locate in the stomach, concurrently with fluid resuscitation and administration of intravenous antibiotics.

The patient's condition was not improved over the next two hours and the bile drainage from gastrostomy tube was increase up to 500 cc. The abdomen was still flat.

Imaging findings

Plain abdominal radiography was performed (Figure 1) and demonstrated a large well-defined intraluminal soft tissue density mass in the dilated stomach near the tip of the gastrostomy tube.



Figure 1: AP supine abdominal film shows a large well-defined intraluminal soft tissue density mass in the dilated stomach near the tip of the gastrostomy tube.

For confirmation and diagnosis of the large gastric mass, abdominal ultrasound was promptly performed. The study showed a complex soft tissue mass surrounding the gastrostomy tube (Figure 2 A, B).

The finding was confirmed by a subsequent CT scan of the abdomen (Figure 3 A, B).

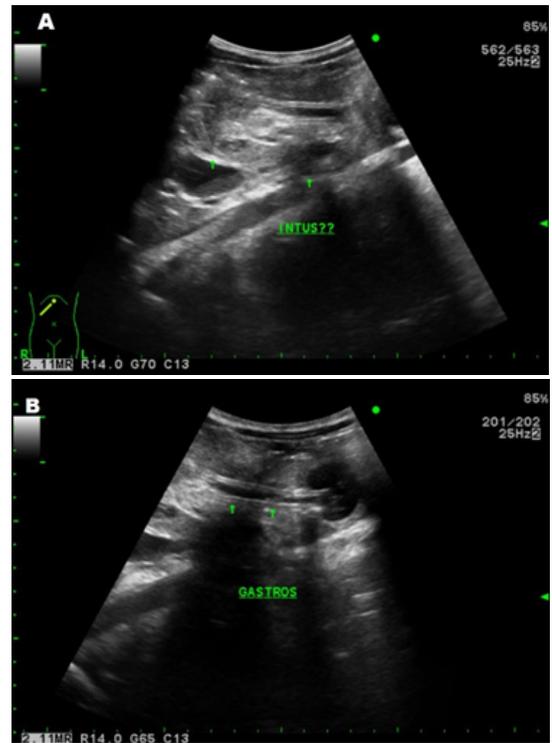
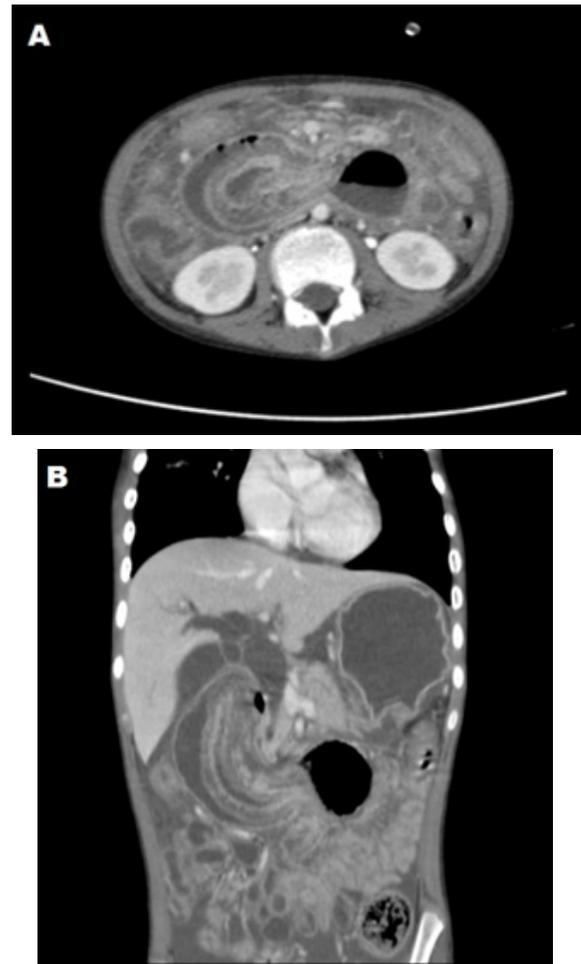


Figure 2: Sonographic images (A) show a soft tissue mass surrounding the gastrostomy tube (arrows in B).



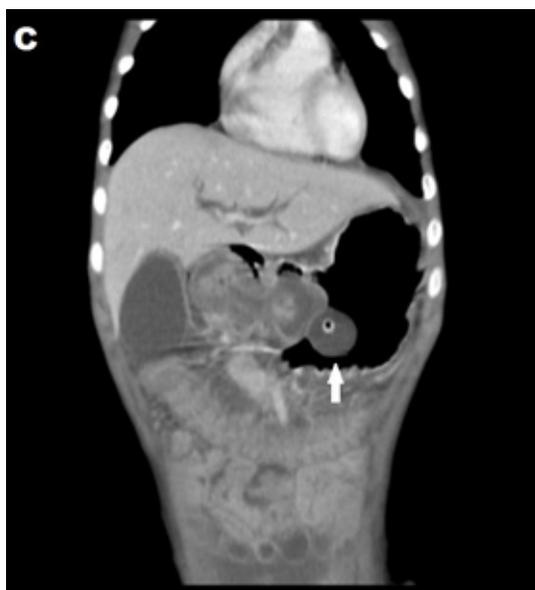


Figure 3: Abdominal CT images demonstrated (A) a concentric alternating hypo- and hyperdense rings, so called “bowel-within-bowel” configuration causing by (B) telescoping of distal duodenum and proximal jejunum into the lumen of duodenum and stomach. The findings are representing jejuno-duodeno-gastric intussusception. Note, dilatation of common bile duct, common hepatic duct and some intrahepatic bile ducts. (C) The gastrostomy balloon (arrow) is located adjacent to the head of intussusception.

Surgical treatment

Urgent operative intervention was then decided. The incision was an extension of the upper-midline abdomen scar from the previous gastrostomy operation. The mass was identified as retrograde jejuno-gastric intussusception around antral area and mobilized through the surgical incision. The incarcerated intussuscepted part of small bowel was manually reduced and associated venous congestion resolved after a short observation period (Figure 4).

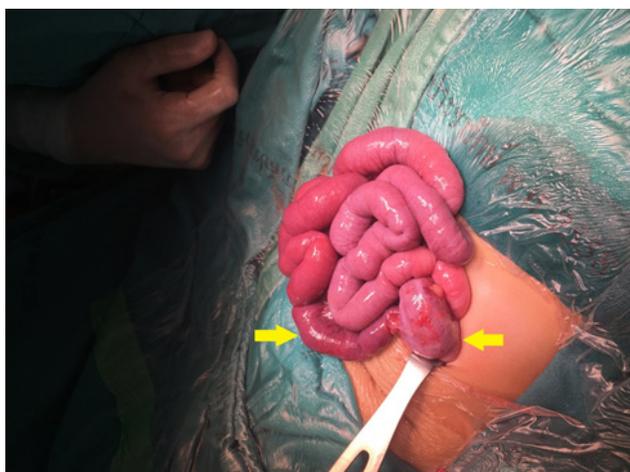


Figure 4: Retrograde jejuno-gastric intussusception. The proximal jejunum (left arrow) had intussuscepted into the stomach (right arrow). The serosal of jejunum was mild congested without ischemic change. The duodenum appeared normal.

jejuno-jejunal intussusception, presented with clinical peritonitis. Plain abdominal radiography was shown in Figure 5.

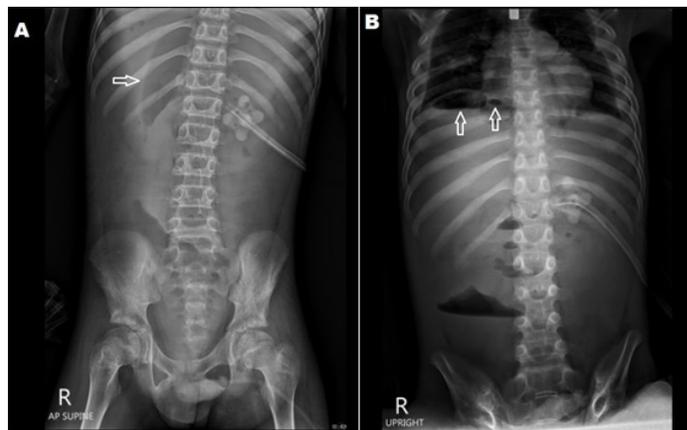


Figure 5: Plain abdominal radiographs at the setting of recurrent intussusception (2nd episode) show evidence of gut obstruction with free air (arrows in A and B).

Emergency exploratory laparotomy was then performed, and detected jejunojejunal intussusception on the proximal jejunum. Additional findings were strangulation and multiple perforation of intussuscepted jejunal segment with the most proximal perforated site located close to duodeno-jejunal (DJ) junction (Figure 6). According to the previous findings, around 21-cm jejunal segment was resected, proximal jejunal stump was closed, gastrojejunostomy was constructed and both feeding jejunostomy and gastrostomy were created.

Post-operatively, the patient was returned to the pediatric intensive care unit (ICU), fluid deprivation and electrolyte imbalance were corrected following with initiating of total parenteral nutrition.

Pathological study revealed transmural hemorrhagic infarction with multiple perforation of jejunum, ranging from 0.5-2.0 centimeters in diameter. Few reactive hyperplasia lymph nodes are found in the periintestinal fat.

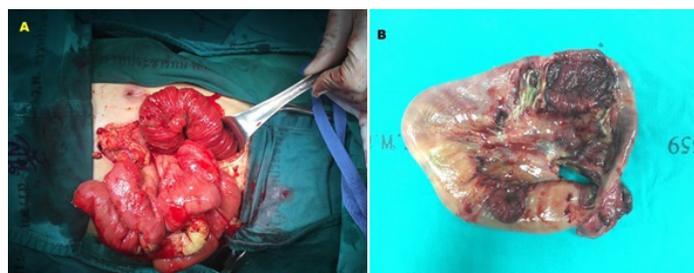


Figure 6: Jejunojejunal intussusception. A: Showing the distal jejunum telescoping into the proximal jejunum (arrow). B: Showing gangrenous and multiple perforated intussusceptum after it was manually reduced by gentle proximal sequential and circumferential pressure. Examination of this intussuscepted jejunum revealed diffuse ischemia with fibrinous exudate covered the external surface measuring around 21 cm in length.

An unexpected postoperative course occurred on day six with

Subsequently, fresh blood was detected from the gastrostomy

catheters. With concerning over the proximal jejunal stump and anastomosis, an upper gastrointestinal (GI) study was performed by administering diluted water-soluble contrast medium through gastrostomy tube. The fluoroscopic images show extraluminal contrast leakage from jejunal loop at left lateral aspect of the gastrojejunostomy anastomotic site (Figure 7).

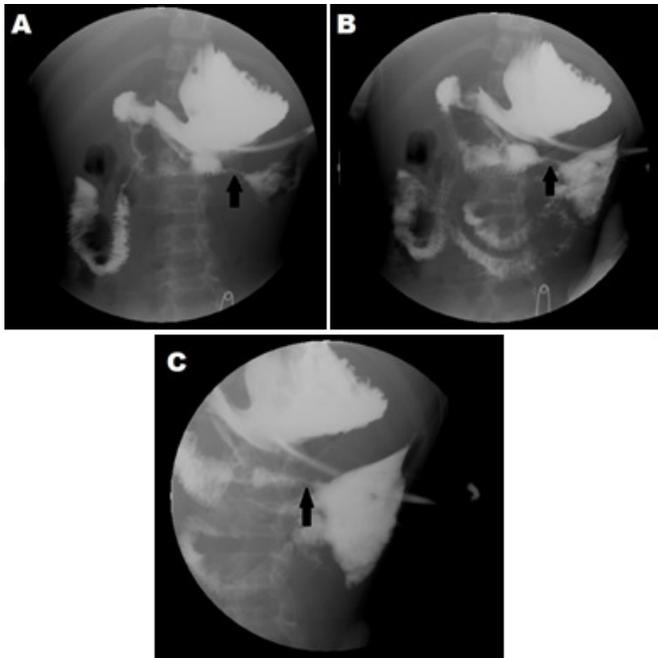


Figure 7: Upper GI study shows leakage of contrast media from the jejunum (arrow in A, B and C) at left lateral aspect of the gastrojejunostomy anastomotic site.

Then gastroscopy was also performed, expected to locate bleeding, revealed a jejunal stump perforation with active bleeding (Figure 8).

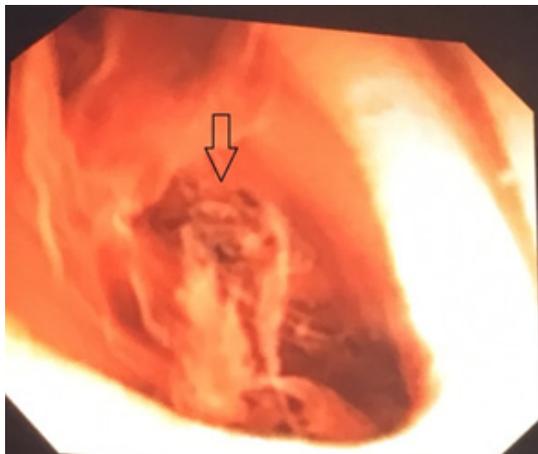


Figure 8: Jejunal stump perforation and active bleeding captured by endoscopic examination.

In order to save the patient life, the third laparotomy was then attempted. Because leakage and bleeding jejunal stump was currently buried in inflammatory tissue near DJ junction, duodenal Kocherization and releasing the ligament of Treitz were done to

mobilize the stump and then primarily closed after debridement of unhealthy tissue. Gastrojejunostomy was repaired. With concerning over the unhealthy duodenal stump, T-tube was inserted into bile duct aiming to divert bile off the anastomosis. Both gastrostomy and jejunostomy tubes were also in place.

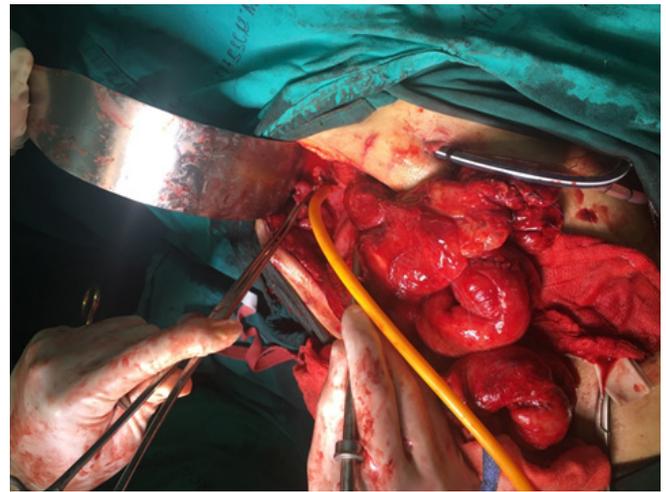


Figure 9: Placement of a T tube.



Figure 10: T-tube cholangiography was performed for confirmation of the T-tube position within the expected location of the biliary tree.

Operative outcomes

After the third operation, the patient has gradually recovered, was successfully discharged from ICU on day 30 and slowly able to tolerate enteral diet.

Post-operative follow-up

At 40-day follow-up, patient's bowel movement has slowly improved without evidence of repeat obstruction. Unfortunately, few weeks later, the patient developed aspiration pneumonia following by sepsis and death.

Discussion

This case poses a clinical challenge of the unusual diagnosis of retrograde jejuno gastric intussusception and its early recurrence in

the same admission, after the first episode occurred, only six days.

Affected patients are often neurologically impaired, and may not be able to describe their symptoms. Vomiting, especially bilious, should raise concern of this potential complication. Otherwise, delay in recognition can lead to bowel necrosis and possible death [5].

Different theories have been proposed for intussusception caused by the placement of feeding tubes [6]:

- The tip of the feeding tube can act as the leading point and drag the proximal segment over the distal segment during a peristaltic wave.
- Retrograde peristalsis of the jejunum during episodes of vomiting.
- The injecting force from the pump during feeding can also drag the bowel, causing intussusception.
- Poorly built patients have reduced fatty tissue in the omentum and mesentery, which may allow the free movement of the bowel causing a predisposition to intussusception.
- An increased caliber or longer length of the feeding used in the bowel segment may produce intussusception due to distal tip migration.
- The Tip of the tube may cause local inflammation of the bowel wall resulting in a pseudopolyp which in-turn may act as a lead-point [4].

The possible mechanisms of our case's first episode probably associated with distal tip and balloon migrated into small bowel causing vomiting from small bowel obstruction. The migrated balloon also served as the leading point to retrograde jejunal peristalsis. Moreover, the force from performing gastric lavage can also drag the bowel into stomach, retrograde jejuno gastric intussusception was then occurred, as a result.

To our knowledge, this patient is the first reported case of the early recurrence of intussusception related to gastrostomy tube. The underlying theory of the mechanism is undoubtedly not available. We assume that early recurrence in this case probably due to the first episode causes bowel wall mucosal edema and inflammation. These can serve as the leading point for the second early recurrent episode.

Although computed tomography is highly sensitive for detecting intussusception, the diagnosis could be made reliably by ultrasound in the experienced hands, as in our case. Suggested initial management are first deflating the balloon and then, with gentle traction, pulling the tube and the balloon into the stomach [4]. If it is unsuccessful or the intussusception comprises a large segment, as seen in this case, surgical management should be performed.

Currently in conditions that long-term gastrostomy tube is needed, as in neurological impaired children, utilizing of gastrostomy-buttons is more preferred [4]. This self-retaining device has a one-

way valve and a very short intraluminal portion within stomach, which is possible able to prevent some complications related to the conventional gastrostomy tubes.

We performed T tube drainage in order to divert bile off the friable duodenal stump with an acceptable outcome. One more appealing option for the difficult duodenal stump is performing pyloric exclusion [8]. However, with gastro-jejunostomy already constructed, the latter option may not be possible in the setting like us.

Conclusion

Although gastrostomy tubes are commonly utilized in patients with feeding problems and associated with low morbidity. Pediatric physicians should be aware of this potentially lethal complication. Early disease recurrence can occur. Patients still need to be closely monitored after successful former treatment, possibly until phase of edema and inflammation resolved. Early recognition and prompt management is the key for good outcome.

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