Jejunojejunal intussusception is a rare complication of jejunostomy, and its preoperative diagnosis and surgical treatment have not been reported. A 78-year-old man suffered from vomiting off and on after emergency exploratory laparotomy with omentoplasty for perforated duodenal ulcer. He also received Witzel jejunostomy for early feeding. Ileus developed postoperatively and plain X-ray of the abdomen showed distended small bowel loop with scanty colon gas. Small bowel series performed with water-soluble contrast medium revealed substantial fluid retention in the stomach, duodenum and proximal jejunum. Infusion of contrast medium into the feeding tube revealed normal caliber of the distal small bowel. Abdominal sonogram revealed target sign as well as the feeding tube in a dilated jejunum. Abdominal computed tomography confirmed the sonographic impression of jejunojejunal intussusception. Reduction of intussusception was done during exploratory laparotomy. The jejunostomy feeding was continued and the postoperative course was uneventful.


Key Words: jejunojejunal intussusception, jejunostomy, target sign

Intussusception is an invagination of a segment of the gastrointestinal tract into an adjacent one. Jejunojejunal intussusception is a rare complication of jejunostomy tube placement. We describe an elderly patient with jejunojejunal intussusception induced by jejunostomy tube placement, who presented with intermittent cramping abdominal pain and postprandial vomiting. Upper gastrointestinal (UGI) series, abdominal ultrasonography, and computed tomography (CT) examination were performed, leading to the preoperative diagnosis of jejunojejunal intussusception. Operative reduction of intussusception was performed, followed by an uneventful recovery; tube feeding was continuously retained through the previous jejunostomy tube.

Case Report

A 78-year-old man was admitted to our hospital due to perforated duodenal ulcer. Emergency laparotomy, with primary repair of the perforation with omentoplasty was performed. Witzel jejunostomy was also done simultaneously to allow early feeding. The patient was recovering well after adequate nutritional support via jejunostomy tube feeding; however, postprandial vomiting of old as well as fresh meals occurred on the 8th postoperative day. After vomiting, colicky pain was relieved until the next oral intake. A nasogastric tube was inserted, but postprandial vomiting continued. Plain abdominal X-ray showed a dilated small bowel loop in the left upper ab-
demen with scanty colon gas. The colicky pain persisted, although vomiting was minimized by placement of the nasogastric tube.

Due to the persistent intermittent symptoms for 3 weeks, small bowel series using water-soluble contrast medium was performed, which revealed retention of the contrast medium in the stomach, duodenum and proximal jejunum. Contrast medium injection into the feeding tube revealed normal caliber of the distal small bowel (Figure 1). Bowel obstruction due to adhesion at the proximal jejunum was impressed. Due to continuing symptoms and the finding of a palpable mass in the left lower abdomen, abdominal sonography was performed, which showed a target sign with the feeding tube in a dilated jejunum (Figure 2). Abdominal CT further identified a target sign in the left abdomen, and intussusception was diagnosed (Figure 3). Therefore, a second exploratory laparotomy was performed, and a 30-cm long fleshy sausage-like tubular intestinal mass was found at the proximal jejunum, 12 cm distal to the entry of the jejunostomy tube. The color of the bowel was pink and normal, but slightly cyanotic and edematous changes were noted. An adhesion point was seen 10 cm distal to the entry of the jejunostomy tube. The intussusception was antegrade in direction, jejunoojejunoojejunosal in nature, and the jejunostomy tube was in a normal position. The two sites of fixation on the jejunostomy were still in position and attached well to the peritoneum (Figures 4 and 5). Complete and careful reduction of the intussusception was performed without any change to the previous jejunostomy tube. Postoperative recovery was uneventful, and the patient was discharged 2 weeks later.

**Discussion**

Jejunostomy is a surgical procedure by which a tube is situated in the lumen of the proximal jejunum, primarily to administer nutrition. There are many techniques used for jejunostomy, including longitudinal Witzel, transverse Witzel, open gastrojejunostomy, needle catheter technique, percutaneous endoscopy, and laparoscopy.¹

In previous studies, the most common complications of tube jejunostomy included mechanical complications (tube dislocation, obstruction or migration), infections (cutaneous or intra-abdominal abscesses, aspiration pneumonia, peritonitis), gastrointestinal symptoms (e.g. nausea, vomiting, diarrhea, constipation, abdominal distension),
and metabolic abnormalities (hyperglycemia, hypokalemia, water and electrolyte imbalance, hypophosphatemia, hypomagnesemia).1–8

In a gastrointestinal imaging study, Carucci et al reported that one or more complications were detected in 40 of 280 (14%) cases at radiographic examination in patients with jejunostomy tubes. The most serious complications included small bowel obstruction, non-obstructive small bowel narrowing, and extraluminal tracks or collections.9 Other complications not previously reported included jejunal hematomas and focal intussusception of the small bowel (1%) at the site of the jejunostomy tube.9

Jejunojejunal intussusception induced by jejunostomy tube was first reported in a series of four patients with small bowel intussusception, three of whom had the transient finding of delayed antegrade flow of contrast material.9 Enteral feeding was continued without difficulty in all patients. The intussusception was associated with small bowel obstruction in only one patient, which gradually resolved within 3 weeks. The four patients had no clinical symptoms found at radiographic examination, and the intussusception resolved without intervention. However, the need for operative management as in the present case has not been previously reported.

This case demonstrates that jejunojejunal intussusception induced by jejunostomy tube may not interfere with tube feeding. The clinical symptoms and findings of plain X-ray and UGI study may not be much different from other causes of small bowel obstruction such as adhesion. Therefore, the diagnosis of intussusception will be delayed. In our patient, failure to demonstrate specific findings of intussusception in UGI series, in contrast to that of the series of Carucci et al,7 might have been due to the use of water-soluble contrast medium instead of barium in our patient.

Possible pathogenic mechanisms for the development of jejunojejunal intussusception in this case were retrograde peristalsis of the jejunum during the vomiting episodes, and an injecting force produced by tube feeding with pump infusion on the jejunostomy tube, which acts as a stent. Our patient was also very thin, with only a very small amount of fatty tissue (omentum, mesentery) in the wide abdominal cavity. This may have allowed the small bowel loops to move more freely in the abdominal cavity, which may have led to conditions favoring intussusception; however, the etiology and mechanism remain unclear.

Although spontaneous resolution of jejunojejunal intussusception induced by jejunostomy tube has been reported previously, only radiographic findings were noted without any clinical symptoms or signs.9 On the contrary, our patient had obstructive gastrointestinal symptoms, and abdominal sonography and CT confirmed the diagnosis preoperatively. Exploratory laparotomy was required due to failure of expectant therapy.

![Figure 4. A sausage-shaped intussusception of the proximal jejunum around the jejunostomy tube.](image)

![Figure 5. A sketch of the intussusception around the jejunostomy tube with two fixation points in position (Witzel method).](image)
Jejunojejunojejunal intussusception without gangrenous change was identified during the operation, and the jejunostomy tube was still in the normal position. The patient was successfully treated with operative reduction without resection of the small intestine, and he recovered well postoperatively. Laparotomy was strongly indicated in this patient due to the significant length and tightness of the intussusception. Although the jejunostomy tube had caused the intussusception, it was not removed during the operation, and no resection of the intussusception was done. This suggests that evacuation of the jejunostomy and resection of the bowel segment of intussusception to prevent recurrence may not be necessary.

In summary, this report describes the successful operative treatment of a patient with a jejunojejunal intussusception due to jejunostomy tube that was diagnosed preoperatively. Jejunojejunal intussusception should be considered if a patient with jejunostomy tube develops high obstructive gastrointestinal symptoms that are completely relieved by nasogastric tube drainage. UGI series is helpful for diagnosis of bowel obstruction, but specific signs of intussusception may not be seen, especially in imaging studies that use water-soluble contrast medium. Abdominal sonography or CT should be arranged if jejunojejunal intussusception is highly suspected. Although radiographic findings of intussusception may be incidental and transient for patients with jejunostomy tube placement, the patient may require laparotomy if gastrointestinal symptoms persist. In patients with a long segment of intussusception, as in our patient, the condition may not resolve and would, thus, require surgical intervention. Jejunojejunal intussusception due to jejunostomy tube can be managed by operative reduction only, and resection is not advised if there is no gangrenous change, perforation or stenosis. In addition, it is not necessary to remove the jejunostomy, and the feeding tube can be used postoperatively without recurrence of intussusception.

References