

## Original Research Article

# Retrograde jejuno gastric intussusception: a single-institution experience over two decades

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### ABSTRACT

**Background:** Jejuno gastric Intussusception (JGI) after gastrojejunostomy is a rare and serious complication.

**Methods:** Retrospective analysis of patients with a diagnosis of JGI was analyzed from November 1995 to October 2015 at our institute. Patient data regarding clinical presentation, investigations, surgical procedures, outcomes and follow-up were obtained from medical records.

**Results:** There were 13 cases of JGI. All were males. The mean age at presentation was 54.69 years (range 46-62). All patients presented with hematemesis or coffee ground vomiting. The time duration from gastrojejunostomy was 5 to 25 years. Upper gastrointestinal endoscopy was diagnostic in 10 cases. In 3 patients, 2 were misdiagnosed as bleeding tumour and as polyp in one patient during endoscopy. All patients underwent surgical management. Most commonest type was Type II (efferent loop) seen in 10 patients; Type III (combined type) was seen in 2 patients. One patient had Type I (afferent loop). Two patients had postoperative wound infection. On median follow-up of 6 years, there were no recurrences.

**Conclusions:** JGI is a rare complication after gastrojejunostomy. Upper gastrointestinal endoscopy is the most accurate diagnostic technique when performed by an experienced endoscopist. Emergency surgery still remains the main stay of treatment. A high index of suspicion is required for diagnosis in patients with prior history of gastrojejunostomy.

**Keywords:** Jejuno gastric intussusception, Gastrojejunostomy, Endoscopy, Intussusception

### INTRODUCTION

In 1914, Bozzi reported the first case of jejuno gastric intussusception (JGI) in a patient with gastrojejunostomy.<sup>1</sup> It is rare and an unusual postoperative complication which can occur any time after gastric surgery. Only case reports and a few case series exist in contemporary medical literature. Just over 200 cases of JGI have been reported, most of them being case reports and small series.<sup>2-5</sup> JGI is less recognized due to general lack of knowledge and the condition probably

occurs more often.<sup>6</sup> We report our experience with this rare complication over two decades.

### METHODS

The records of patients diagnosed with jejuno gastric intussusception at Sri Venkateswara Institute of Medical Sciences from November 1995 to October 2015 were analysed retrospectively. Patient demographics, clinical presentation, diagnosis, investigations, operative notes, management and histopathology reports were reviewed

and data was collected from case records from medical records department. Jejunogastric intussusception was defined as invagination of afferent or efferent or both loops of jejunum through the gastrojejunostomy stoma.

**RESULTS**

There were 13 cases of JGI. All were males. The mean age at presentation was 54.69 years (range 46-62). All patients presented with hematemesis or coffee ground vomiting. In addition, 3 patients had pain abdomen and 2 patients had malena. On abdominal examination, six patients had diffuse abdominal tenderness and palpable lump was present in 4 cases. The time duration from gastrojejunostomy was 5 to 25 years. Upper gastrointestinal endoscopy was diagnostic in 10 cases. In 3 patients, 2 were misdiagnosed as bleeding tumour and as polyp in one patient during endoscopy. All patients underwent surgical management. Most common type was Type II (efferent loop) seen in 10 patients. Type III (combined type) was seen in 2 patients. One patient had Type I (afferent loop). In 5 patients, the intussusception was reduced without the requirement of gastrotomy and the jejunal loops were fixed.

In 3 patients, a gastrotomy was done to facilitate the reduction of intussusception followed by fixation of the jejunal loops. In 2 patients, the gastrojejunostomy was taken down along with resection of the gangrenous jejunum and a Roux- en- Y reconstruction was done. In 3 patients, distal gastrectomy was required as the intussusception could not be reduced and a Roux- en- Y reconstruction was done for maintaining intestinal continuity. Two patients had postoperative wound infection. On median follow-up of 6 years, there were no recurrences. There was no mortality.

**Table 1: Type of jejunogastric intussusception.**

| Type of jejunogastric intussusception | Number of patients (N=13) |
|---------------------------------------|---------------------------|
| Type I (afferent loop)                | 1                         |
| Type II (efferent loop)               | 10                        |
| Type III (combined type)              | 2                         |

**Table 2: Surgical treatment.**

|  | Number of patients (N=13) |
|--|---------------------------|
| Reduction with fixation of jejunal loops                 | 5                         |
| Reduction after Gastrotomy and fixation of jejunal loops | 3                         |
| Jejunal resection with Roux- en- Y reconstruction        | 2                         |
| Distal gastrectomy with Roux- en- Y reconstruction       | 3                         |

**DISCUSSION**

In this article, we report our experience of retrograde jejunogastric intussusception (JGI) after gastrojejunostomy over two decades.

Bozzi reported the first case of JGI in a patient with gastrojejunostomy.<sup>1</sup> Literature review showed that just over 200 cases have been reported, most of them being case reports and small series.<sup>2-5</sup> The reported incidence is less than 0.1% to 0.15%.<sup>7,8</sup> Retrograde intussusception was also reported in patients after Billroth-I reconstruction, Billroth-II reconstruction, previously placed gastrotomy tubes, pancreaticojejunostomy and total gastrectomy with Roux-en-y- anastomosis.<sup>2-4,9-11</sup> Over a period of 72 years, only 16 cases were reported at Mayo clinic.<sup>12</sup>

Shackman described three anatomic types of JGI, according to the invaginated loop.<sup>6,13</sup> Type I is afferent loop invagination or antegrade intussusception. Type II is efferent loop invagination or retrograde or ascending intussusception and type III is intussusception of both loops or combined intussusceptions. Few authors describe Type IV, which consists of over intussusception through a braun side-to-side jejunojunal anastomosis.<sup>3,5</sup>

The etiopathogenesis and mechanism of JGI are unclear and poorly understood.<sup>2,3,14,15</sup> The major theories suggested are functional and mechanical. Robertson DS and Weder C suggested the functional theory that is most widely accepted. The functional theory states that disordered motility with functional hyperperistalsis triggered by spasm or hyperacidity causes JGI.<sup>14,16</sup> Other factors are adhesions, long mesentery, gastric derangements, sudden increase in abdominal pressure and derangements in the stomal function and retrograde peristalsis.<sup>2,14,15,17,18</sup>

In reported literature, the interval between JGI after gastric operation varied from 5 days to 55 years.<sup>8,14</sup> In our series, the duration was 5 to 25 years. Clinically JGI can present in acute or chronic form. In the acute form, patients present with colicky pain in epigastrium, associated with nausea and vomiting. Severe haemetemesis can result from secondary ulceration and due to compromised jejunal vascular supply.<sup>3,19</sup> Features of gastric outlet obstruction or high intestinal obstruction can be present. Epigastric tenderness and a palpable abdominal mass and signs of high intestinal obstruction are additional findings on examination.<sup>2,20</sup> In our series, all patients presented with haemetemesis or coffee-ground vomiting. Epigastric pain was present in 6/13 patients and a palpable lump in 4/13 patients. High index of suspicion is required for diagnosis in a patient with previous gastric surgery as the clinical picture can be non-specific. In the chronic form, spontaneous reduction occurs with milder and transient symptoms.<sup>14</sup>

JGI can be diagnosed by imaging. Early diagnosis and the acute form is of paramount importance.<sup>3</sup> Plain radiograph may reveal gastric fluid level with a filling defect.<sup>15</sup> A homogenous soft tissue density at the left upper quadrant may represent small bowel in the stomach.<sup>4,21</sup> A water soluble upper GI contrast study or barium study will reveal “coiled spring” appearance and a central defect in the stomach.<sup>4,15</sup> Upper gastrointestinal endoscopy is diagnostic and therapeutic in selected cases.<sup>15</sup> It is the diagnostic procedure for patient with hematemesis.<sup>3</sup> UGI scopy will visualise the the intussuscepted jejunal loop in stomach, however viability cannot be assessed due to limited visibility.<sup>22</sup> It can be mistaken as an immobile clot or a bezoar or tumour.<sup>3,13,23</sup> Only 10 out of 13 cases, were diagnosed at endoscopy. In 3 cases, it was mistaken for tumour and the diagnosis was made on laparotomy. Provocation of JGI during endoscopy by the use of jet of water directed towards the anastomotic stoma may be diagnostic of the chronic form.<sup>2</sup> Endoscopic reduction of JGI is contraindicated when peritoneal signs are suspected. Endoscopic reduction is associated with recurrence.<sup>24</sup> Ultrasound findings reveal a mass with echogenic center surrounded by concentric echogenic rings with a peripheral rim of hypoechogenicity. On transverse images, this rim has been described as doughnut sign and longitudinal images as pseudo kidney sign.<sup>18</sup> Ultrasound abdomen cannot detect the dilation and obstruction of the intestine in the presence of profuse intestinal gas. Abdominal CT is the most useful procedure for identifying JGI when profuse abdominal gas prevents US from visualizing invagination.<sup>25</sup> CT findings of intussusception include a soft tissue mass with a “sausage” or target appearance.<sup>18</sup> Additionally, a crescent-shaped, eccentric low-attenuation component representing the entrapped mesenteric fat is typically present.

Most reported cases of JGI were diagnosed at surgery. In all types of acute JGI immediate surgical treatment is necessary. Surgical options include manual reduction, resection of gangrenous bowel, anastomotic revision and take down of anastomosis and conversion to Roux-en-Y reconstruction depending on intra-operative findings.<sup>14,19</sup> Reduction by gentle traction with or without opening the stomach should always be attempted. When there is strangulation with gangrenous bowel resection will be mandatory.<sup>6,15,25,26</sup> Laparoscopic examination with reduction of of the intussusception via a minilaparotomy wound.<sup>24</sup>

To prevent recurrence few authors suggested fixation of jejunum to the adjacent tissue, mesocolon, colon, stomach or falciform ligament.<sup>14,24,27</sup> The role of fixation has been debated as the chance of recurrence is rare.<sup>6,12</sup> Bettman found only two recurrences among all the reported cases.<sup>28</sup> High mortality (10 to 50%) associated with this condition is due to poor preoperative condition of the patient, delay in diagnosis and surgical exploration.<sup>6,29</sup>

## CONCLUSION

JGI is a rare complication after gastrojejunostomy. Upper gastrointestinal endoscopy is diagnostic. Ultrasound and computed tomography of abdomen can of additional help. This complication can occur years after surgery. High index of suspicion is required for diagnosis. Prompt surgical intervention, still remains the main stay of treatment.

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