

Duodenal Intussusception Secondary to a Duodenal Polyp: A Case Report and Literature Review

Mahtab Washdil^{1*}, Ghina Shamim Shamsi¹, Syed Ali Naqi¹ and Ihsan Ahmed¹

¹Department of General Surgery, The Indus Hospital, Karachi, Pakistan

ABSTRACT

A 25-year-old male, with no co-morbidities, presented in out-patient department with a complaint of episodic early post-prandial colicky upper abdominal pain for one year associated with vomiting of gastric contents. Contrast-enhanced abdominal CT and upper GI contrast study revealed a polyp in the second part of duodenum (D2) causing intussusception. Wedge resection of that segment was done in addition to polypectomy. The postoperative course was unremarkable.

Duodenal intussusception is exceptionally rare and often associated with intestinal malrotation or pre-existing pathologies like tumors. In adults, over 90% of cases result from underlying conditions, with tumors being the leading cause. Proper surveillance is crucial due to their association with tumor predisposition syndromes.

Intestinal obstruction secondary to duodenal intussusception due to duodenal polyp is rare. Clinical presentation and management vary amongst patients. It is often diagnosed *via* CT and upper GI contrast studies. Polypectomy or wedge resection and anastomosis of the involved segment can be undertaken.

Keywords: Case report, duodenal intussusception, polyp, intestinal obstruction, pathological lead point.

INTRODUCTION

Invagination of a part of the gut into the lumen of another adjacent segment is called intussusception. It was first described by Paul Barbet in late 1600s. Harald Hirschsprung in 1876 introduced hydraulic enema to reduce intussusception successfully while surgical intervention was first considered by Sir Jonathan Hutchison in 187 [1]. Intestinal intussusception is a common disorder in young children usually occurring without an obvious cause and is called primary or idiopathic. It is a rare phenomenon in adults representing just 5% of all cases of intussusception [1]. Of intestinal obstruction in adults, only 1% of cases are attributable to intussusception [2, 3]. Of the two types, primary idiopathic one is common in children while intussusception is usually secondary to any other intestinal pathology which acts as a pathological lead point. There is no gender predominance. One study showed a mean age of 54.5 years with no gender predominance [4].

CASE PRESENTATION

A 25-year-old male, with no prior co-morbid conditions presented in out-patient department with a history of recurrent episodic colicky upper abdominal pain for the last one year. The pain was early post-prandial, around 30 minutes after food ingestion, associated with vomiting of gastric contents, lasting for 10-15 minutes and then would settle down on its own. It was not associated with melena, jaundice, fever, or any lower GI symptoms. Examination revealed no jaundice or

peripheral lymphadenopathy, his abdomen was soft and showed no tenderness, had a positive succussion splash and no visceromegaly. Imaging with contrast-enhanced abdominal CT scan showed telescoping of the first part of duodenum, head of pancreas and distal common bile duct into the second part of duodenum, length of intussusceptum measuring 14cm, causing dilatation of CBD (1.2cm), prominence of the pancreatic duct (0.26cm) and gastric dilatation (**Figs. 1-3**). Upper GI endoscopy showed a polyp at the junction of D2 and D3. Histopathology revealed an adenomatous polyp showing high-grade dysplasia. His liver function tests and pancreatic enzymes (amylase/lipase) were normal. He underwent elective laparotomy. Intraoperatively, an

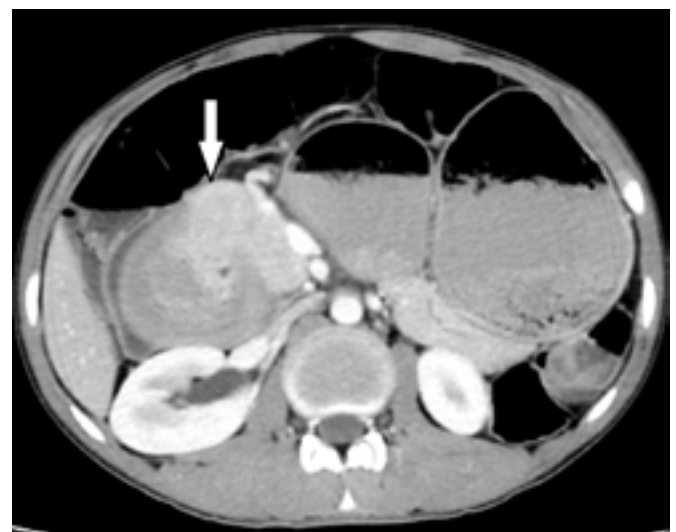


Fig. (1): Telescoping of pancreatic head and common bile duct into second part of the duodenum (arrowhead) resulting in dilatation of the stomach.

*Corresponding author: Mahtab Washdil, The Indus Hospital, Karachi, Pakistan, Email: mahtaabwashdil@gmail.com

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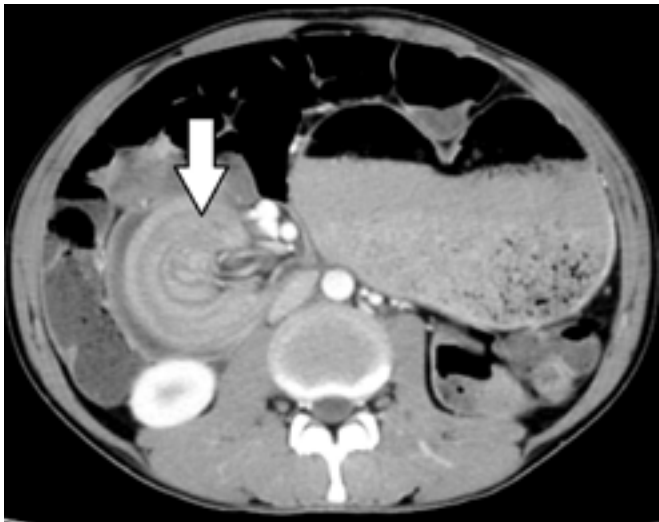


Fig. (2): Telescoping of the first part of duodenum into second part of the duodenum giving target sign (arrowhead) resulting in dilatation of the stomach.



Fig. (3): Telescoping of the first part of duodenum into the second part (arrow) with proximal gastric dilatation (arrowhead) (coronal view).

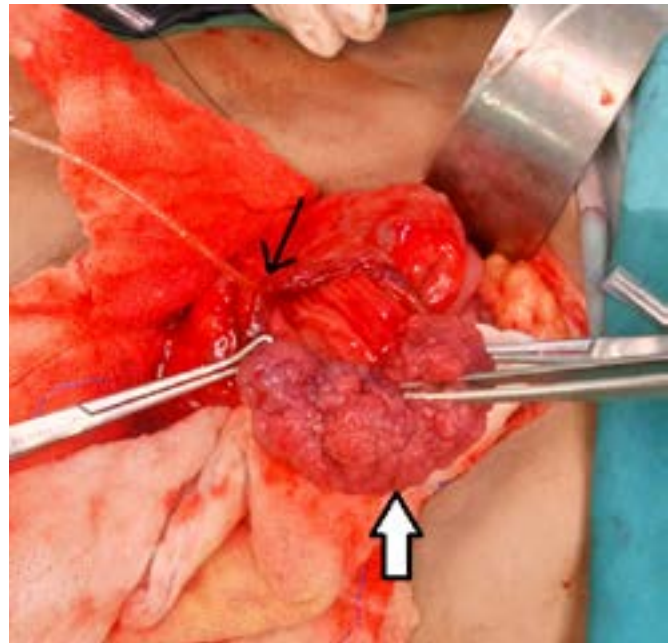


Fig. (4): Polypoidal friable 5*7cm mass seen after lateral enterotomy (arrowhead); feeding tube was passed proximally into the common bile duct (arrow).

intussusception of D2 into D3 was noted. After reducing it manually, lateral enterotomy in D2 was done. A large polypoidal bossellated, friable growth of around 5x7cm was seen arising from the lateral wall of D2 (**Fig. 4**). The polyp with its stalk was excised. Wedge resection of that segment was done. The enterotomy was then closed. Histopathology showed adenomatous polyps with high-grade dysplasia. Postoperatively, the patient remained stable and pain-free on 2-month follow-up.

DISCUSSION

Duodenal intussusception is an extremely rare entity due to the relatively fixed position of duodenum in contrast to the excessive mobility that is usually seen in cases of intestinal malrotation [5]. Without malrotation, it is not frequently seen owing to the relatively fixed retroperitoneal position of duodenum.

A literature search showed a few cases, the commonest cause being duodenal polyps (**Table 1**).

In children, this is usually primary, without any pathological lead point, however, more than 90% of cases in adults

Table 1: Summary of cases of duodenal intussusception.

Author, Country	Age, Gender	Clinical Presentation	Imaging	Pathology/ Cause	Management	Histopathology
Wang <i>et al.</i> China [10]	36years, male	Dull upper abdominal pain and tenderness for 15 days	CECT and MCRP showed a mass in the distal duodenum with proximal DDI; prominent common biliary and pancreatic duct	5x3.5cm pedicled tumor in ascending duodenum causing proximal DDI	Resection of the tumor with a 1 cm margin and primary closure of the duodenum	Tubulo-villous adenoma with low-grade epithelial intra-epithelial neoplasia
Pradhan <i>et al.</i> India [7]	16years, female	Post-prandial vomiting and upper abdominal pain with weightloss for 4 years; palpable mass and visible peristalsis in epigastrium	CECT showed 4x3x3cm enhancing mass in D2 with proximal DDI	Polyp in the posterior wall of D2	Polypectomy with resection of the duodenum and duodeno-duodenal anastomosis	Villous adenoma with high-grade dysplasia

Author, Country	Age, Gender	Clinical Presentation	Imaging	Pathology/ Cause	Management	Histopathology
Guo <i>et al.</i> China [11]	21years, male	Intermittent abdominal pain and vomiting for 1 day	CECT showed duodeno-jejunal intussusception, no lesion found on CECT or endoscopy	Large diverticulum at the junction of D3 and D4	Resection of the diverticulum and primary closure of the duodenal wall	Non-specific acute on chronic inflammatory changes
Pradhan <i>et al.</i> India [7]	59 years female	Colicky upper abdominal pain and weightloss with anorexia for 1.5 years	CECT showed enhancing mass in D2-D3, polypoidal filling defect in D2-D3 in contrast study	5.2x4.3cm mass in D2-D3 with enlarged peri-duodenal lymph nodes	Moderately	Moderately differentiated adenocarcinoma of duodenum; pT3 N0 M0-stage II B
Pradhan <i>et al.</i> India [7]	60 years male	Early satiety and post-prandial fullness for 2 months with jaundice; 7x5x4cm mass in the upper abdomen with visible peristalsis	CECT showed intussusception of D2 into D3-D4 and polypoidal filling defect with pancreatic and biliary obstruction	Polyp of around 4x2cm	Duodenal resection with gastro-jejunostomy	Tubulo-villous adenoma without any dysplasia
Matsuura <i>et al.</i> China [12]	36years male	Upper abdominal pain	Intussusception on abdominal ultrasonography and CECT; spontaneously reduced on double-balloon endoscopy	open resection of the tumor and primary closure	Duodenal mass	Adenocarcinoma of duodenum
Lingala <i>et al.</i> United States [13]	38 years male	Intermittent upper abdominal pain and vomiting for 2 days; hematemesis and melena a few days back; alcoholic male Upper abdominal tenderness with melena on digital rectal examination	Ultrasonography and CECT showed DDI	Endoscopy showed an ulcer on lesser curvature and duodenal bulb with a blood clot on it	Endoscopic clot removal	Non-specific acute on chronic inflammation

DDI-duodeno-duodenal intussusception; D-duodenum; CECT-contrast enhanced CT

are secondary to a pre-existing intestinal pathology acting as a pathological lead point, of which 65% are due to tumors [6]. Other lesions include tubulo-villous adenoma, ampullary lesions, duplication cysts, ulcers, congenital malrotation, or polyps [7]. Apart from these, lipoma, Meckel's diverticulum, ectopic pancreas, fibroma and leiomyoma have also been observed in cases of small bowel intussusception along with gastrointestinal stromal tumors, sarcoma, or even neuroendocrine tumors. The second most common cause after tumor is postoperative factors.

The clinical presentation varies. The most common symptoms correspond to features of intestinal obstruction, including colicky abdominal pain, nausea or vomiting, and absolute constipation as well as upper or lower gastrointestinal bleeding. One study showed 74% of the patients had abdominal pain, and the incidence of melena and nausea/ vomiting were 25.3% and 19.3%, respectively [4].

The location of duodenal polyps may vary. They are either in the duodenal bulb, peri-ampullary region, or in the distal part of duodenum. Some lesions are exclusively diagnosed in the peri-ampullary region (e.g. tumors of pancreatobiliary differentiation, gangliocytic paragangliomas and somatostatin-expressing neuroendocrine tumors) and form a distinct group. Most duodenal polyps are non-neoplastic. They are rather hyperplastic nodules (38%). Other less common polyps include heterotopic (6%) and neoplastic lesions (11%). Adenomas of intestinal type are the most common (89%),

followed by adenomatous lesions that present a gastric phenotype (3%) [8, 9]. Duodenal polyps can present with many tumor predisposition syndromes like familial adenomatous polyposis, Peutz jegher's syndrome, or Cowden's syndrome and have different risks to tumor progression hence need proper surveillance [8].

Those polyps causing intussusception and secondarily intestinal obstruction are usually diagnosed intra-operatively. Intussusception without hemodynamic instability is diagnosed *via* abdominal imaging either using contrast enema, usually barium, or alternatively gastrointestinal angiography. While abdominal ultrasound can be used as a first line that shows telescoping of the bowel segments, CT scans are increasingly being used in the diagnosis. CT scans usually clearly reveal the three-layer structure of intussusception comprising the outer layer-intussusceptien (distal segment), the middle layer of mesenteric fat and the inner, intussusceptum (proximal segment), it helps identify the anatomy of the gastrointestinal tract. Management varies with the clinical presentation and hemodynamic status of the patient. In hemodynamically unstable, emergency exploratory laparotomy is undertaken and usually resection anastomosis including defected segment is done [8]. In our case wedge resection of the involved segment with resection of the polyp was done.

CONCLUSION

Intestinal obstruction secondary to duodenal intussusception as a result of duodenal polyp is a rare

clinical entity. The clinical presentation and management vary amongst patients. For hemodynamically stable patients, diagnosis is made *via* contrast-enhanced CT and upper GI contrast study. Surgery is the mainstay of treatment but the level of surgical resection depends on the underlying pathology. For a duodenal polyp either polypectomy alone or polypectomy along with wedge resection and anastomosis of the involved segment can be undertaken.

CONSENT FOR PUBLICATION

Written informed consent was taken from the parents of the patient.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTION

Mahtab Washdil is the corresponding author/lead author. Mahtab Washdil, Ihsan Ahmed and Ali Naqi had written the manuscript after compiling the data, and doing literature search. However, proofreading has been done by Ghina Shamsi.

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