



## GASTRODUODENAL INTUSSUSCEPTION- A PICTORIAL CASE SERIES

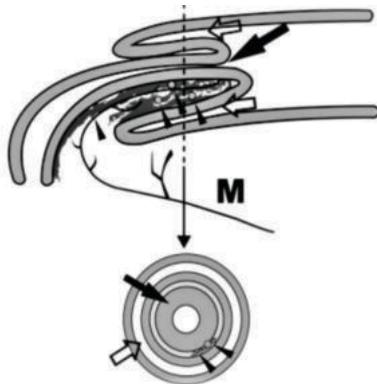
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**ABSTRACT** Intussusception is defined as an invagination, or telescoping of the full thickness of a portion of the alimentary tract (intussusceptum) into the portion just cephalad or caudad (intussusciens). We have reported 3 cases of gastroduodenal intussusception, it is an unusual location of intussusception. the diagnosis can be confirmed using multimodality radiological approach: Barium meal follow through, Ultrasonography, Computed tomography. Computed tomography is the superior modality amongst them as avails us information about lead point complications associated with it.

**KEYWORDS :** Intussusception, computed tomography, Barium meal follow through.

**INTRODUCTION:-**

Intussusception is defined as an invagination, or telescoping of the full thickness of a portion of the alimentary tract (intussusceptum) into the portion just cephalad or caudad (intussusciens). Intussusception remains one of the commonest causes of acute abdomen in children<sup>3</sup>.



Longitudinal (top) and cross-sectional (bottom) diagrams illustrate a typical transient type intussusception, with invagination of a segment of the gastrointestinal tract (intussusceptum) (solid arrows) into an adjacent segment (intussusciens) (open arrows).

Note also the invagination of the mesentery (M) and mesenteric vessels (arrowheads).

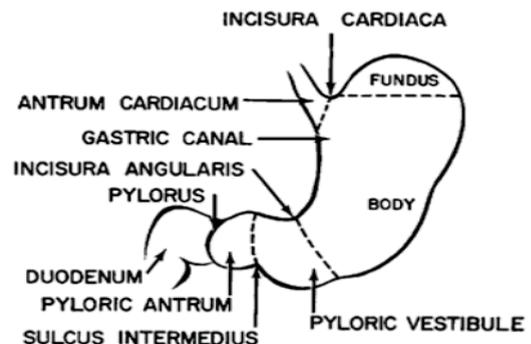
Ref :- Kim YH, Blake MA, Harisinghani MG, Archer-Arroyo K, Hahn PF, Pitman MB, Mueller PR. Adult intestinal intussusception: CT appearances and identification of a causative lead point. *Radiographics*. 2006 May;26(3):733-44.

Intussusception can be categorised into five main categories on the basis of location<sup>6</sup>.

1. Ileo-colic most common (70-90%)
2. Gastro-enteric rare (<10%)
3. Entero-enteric
4. Colo-colic
5. Ileo-ileal

Clinical diagnosis of intussusception is challenging as the classic clinical triad of (abdominal pain, currant red jelly stools, and abdominal mass) at the time of presentation is only seen in 7.5–40% of cases, it may also presents as post-prandial epigastric pain, nausea and vomiting occur due to obstruction<sup>5</sup>. Hematemesis and melena may also occur due to ulceration or strangulation. Therefore Radiological imaging [barium study, ultrasonography (USG), computed tomography (CT)] plays an quintessential role in the diagnosis of intussusception.

Gastro duodenal intussusception, however, is a rare type of intussusception. It is defined as prolapse of part of the stomach through the pylorus to the duodenum. Various gastric lesions including adenoma, leiomyoma, lipoma, hamartoma, inflammatory fibrinoid polyp, adenocarcinoma, and leiomyosarcoma can serve as lead points. Typical radiologic findings include foreshortening and narrowing of the gastric antrum, converging or telescoping of mucosal folds in the antrum or duodenum, prepyloric collar-shaped outpouchings, and widening of the pyloric canal and the duodenum with an associated lead point<sup>7</sup>.



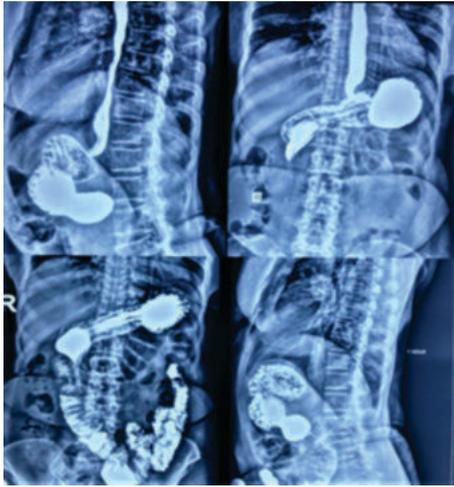
Diagrammatic representation of gastric segments and duodenum.

Gastro-duodenal intussusception is broadly classified into:-

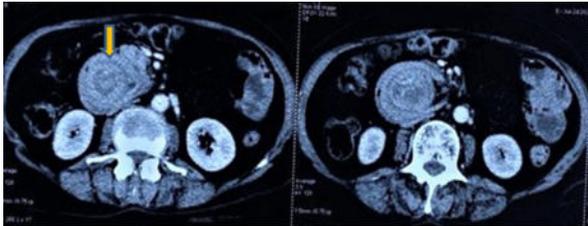
- a) Partial or complete intussusception: according to whether the mucosa alone or the whole thickness of the stomach wall is involved<sup>2</sup>.
- b) Central or Lateral type of intussusception: In the central type the whole circumference of a portion of the stomach is invaginated into the duodenum so that the axis of invagination is parallel to the alimentary axis. In the lateral type a funnel-shaped invagination is present, the axis being at an angle to the alimentary axis<sup>2</sup>.
- c) It may also be classified into four grades according to the part of the duodenum the apex of the intussusception occupies<sup>2</sup>.

**Case 1.**

A 35 year old male came to emergency department with complaint of pain in upper abdomen since 3-4 days, the pain was insidious in onset, progressive in nature, radiating to back and got aggravated on eating something and was not relieved on taking oral medications for which documents were not available. Patient does not have any significant past history. On clinical examination, abdomen was soft with mild tenderness in the epigastrium and right hypochondrium. There were no signs of guarding, rigidity or distension with normal bowel sounds. Laboratory data showed mildly elevated C reactive protein. We did some radiological investigation such as Barium meal follow through and computed tomography to confirm the diagnosis.

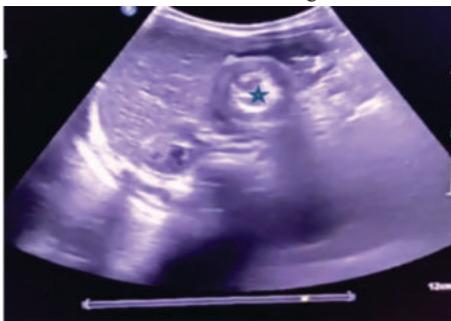


**Figure 1.** Conventional radiography Barium meal follow through showing Parallel transverse striations which run at right angles to the axial striations. These are due to accumulation of barium in the mucosa of the intussusception and lie outside the converging axial striations



**Figure 2.** Axial view Abdominal CT scan showing a small intussusception (bowel within bowel sign- down arrow) involving the pylorus of the stomach and the first part of the duodenum. This however, did not cause a significant obstruction to the gastric outlet and the stomach was collapsed. No lead point mass or lesion was identified in the study.

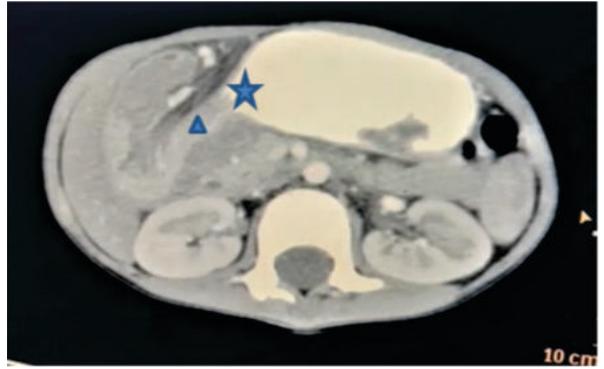
Case 2. A 8 year old child came to pediatrics department with complain of pain in upper abdomen which is insidious in onset, progressive in nature and was non radiating and does not have any aggravating and relieving factor. Patient also gave history of loose stools since 4-5 days. On examination a soft, non-tender lump was felt in right upper quadrant. We did a trans abdominal sonography to characterize the lesion and to make a final diagnosis .



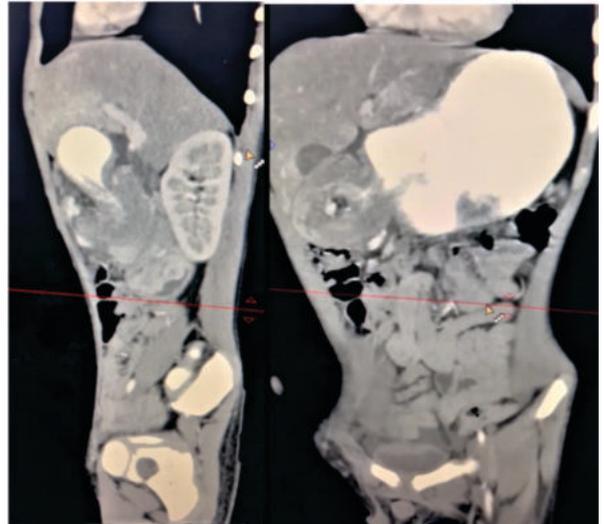
**Figure 1.** Transverse sonography of a palpable abdominal mass shows a swirled pattern of alternating hyper echogenicity and hypo echogenicity. This represents the alternating layers of mucosa, muscularis, and serosa seen in intussusception giving it a 'target' appearance/ Doughnut sign( star mark).

On computed tomography it was confirmed as gastro duodenal intussupetion.

Case 3. A 48-year-old male was referred with a 1-week history of persistent upper abdominal discomfort, vomiting and anorexia. He had similar, but milder, episodes intermittently over the preceding 2 months. The only abnormal finding on haematological investigations was a mildly elevated urea level, which was consistent with her dehydrated state secondary to vomiting. She underwent a contrast-enhanced abdominal CT scan.



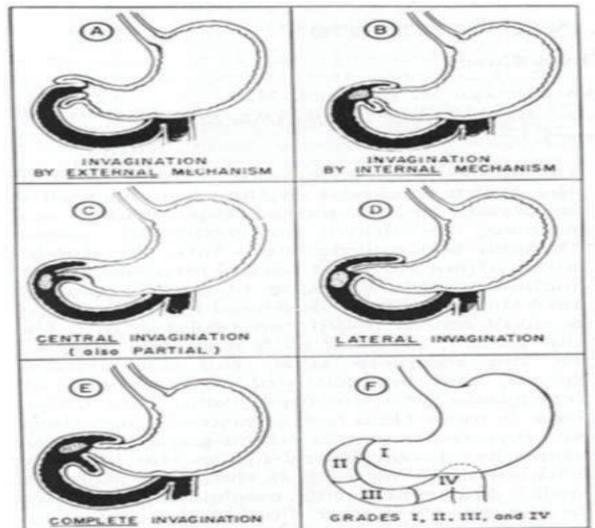
**Figure 1:-** a) Axial CT of the abdomen and pelvis with oral and IV contrast Intussusception of the gastric body and pylorus (star) into the proximal duodenum (Triangle) demonstrating gastro duodenal intussusception.



**Figure 2,3.** Sagittal and coronal CT of the abdomen and pelvis with oral and IV contrast demonstrating telescoping of stomach into the duodenum, however no obvious lead point was determined and no signs of obstruction was evident.

**DISCUSSION:-**

Variations in the normal peristalsis of the intestine might result in intussusception. Although it can happen anywhere in the gastrointestinal tract, the small bowel is where it commonly manifests itself and is identified more frequently than in the big bowel. Intussusception of the stomach and duodenum is extremely uncommon because of the relatively immobile and immovable tissues.



**FIG. 1.** Classification of gastroduodenal intussusception.

Gastro duodenal intussusception can be classified as:

- (1) Partial or Complete
- (2) Central or lateral
- (3) Invagination with internal or external mechanism
- (4) grade I, II, III, or IV.

Hobbs and Cohenl classify the severity of the intussusception into grades I to IV, corresponding successively to the position of the apex of the invagination in relation to the four portions of the duodenum I.

The diagnosis depends on history, physical examinations as well as imaging. Although negative in 20% odd cases, the ultrasound has almost 100% specificity in diagnosis particularly in children. However, adult intussusception is best diagnosed with CT scan as the favourable imaging technique<sup>3</sup>.

SchmiW established criteria for recognition of gastroduodenal intussusception on conventional barium study. These include:

1. A filling defect in the duodenal bulb with foreshortening of the antrum during antral systole<sup>1</sup>.
2. Converging axial striations present in the stomach or duodenum, or in both. These striations are caused by tension on the gastric mucous membrane as it is drawn into the duodenum, with the creation of longitudinal folds which converge on the pyloric canal. The axial striation represents barium within mucosal folds in the lumen of the intussusception<sup>1</sup>.
3. Parallel transverse striations which run at right angles to the abovementioned axial striations. These are due to accumulation of barium in the mucosa of the intussusception and lie outside the converging axial striations.

Since CT is now the preferred method for evaluating individuals with acute abdomen, it is most commonly used to scan intussusception. Additionally, temporary intussusception of short length is frequently discovered by accident<sup>1</sup>.

Depending on where in the bowel the images are taken and the imaging plane, intussusception can appear differently on a CT scan. The most well-known is the "bowel-within-bowel configuration," in which the bowel's layers are duplicated and, when viewed longitudinally, create a soft tissue sausage and, when imaged at right angles to the lumen, form concentric rings (the CT equivalent of the ultrasonography target sign) The intussusception will have two concentric enhancing / hyperdense rings at its proximal end.

Clinical presentations and imaging findings might help to decide whether to proceed for surgical intervention in patient presented with intestinal obstruction or having lead point. Intussusception can be treated conservatively or surgical intervention needs to be done. All patients who treated conservatively are followed up to ensure no complication like obstruction has developed.

#### REFERENCES:-

1. Riccobono XJ, Haskins RM. Gastroduodenal intussusception: Report of two cases. *Gastroenterology*. 1960 Jun 1;38(6):995-1002.
2. Al-Roubaie A, Withanage I. Covert gastroduodenal intussusception: a case report. *Journal of Surgical Case Reports*. 2022 May;2022(5):rjac232.
3. Khasawneh R, El-Heis M, Al-Omari M, Al-Qaralleh MA, rahman Al-Manasra A, Alqudah AA, Awad S. The radiological characteristics of childhood intussusception including unusual features and rare pathological lead points. *Heliyon*. 2021 Jun 1;7(6).
4. Stein J, Perlman BB, Povalski A. Gastroduodenal intussusception. *Radiology*. 1958 Sep;71(3):412-4.
5. Shum JS, Lo SS, Ka SY, Yeung CW, Ho JT. Gastroduodenal intussusception. *Abdominal imaging*. 2007 Nov;32:698-700.
6. Choi SH, Han JK, Kim SH, Lee JM, Lee KH, Kim YJ, An SK, Choi BI. Intussusception in adults: from stomach to rectum. *American Journal of Roentgenology*. 2004 Sep;183(3):691-8.