

## Adult Intussusception-Our Institutional Experience

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### Introduction

First reported in 1674 by Barbette of Amsterdam<sup>[1]</sup> and further presented in a detailed report in 1789 by John Hunter<sup>[2]</sup> as “introssusception”, intussusception represents a rare form of bowel obstruction in the adult, which is defined as the telescoping of a proximal segment of the gastrointestinal (GI) tract, called intussusceptum, into the lumen of the adjacent distal segment of the GI tract, called intussusciens.

Adult intussusception represents 5% of all cases of intussusception and accounts for only 1%-5% of intestinal obstructions in adults<sup>[3]</sup>.

The condition is distinct from pediatric intussusception in various aspects. In children, it is usually primary and benign, and pneumatic or hydrostatic (air contrast enemas) reduction of the intussusception is sufficient to treat the condition in 80% of the patients.

In contrast, almost 90% of the cases of intussusception in adults are secondary to a pathologic condition that serves as a lead point, such as carcinomas, polyps, Meckel’s diverticulum, colonic diverticulum, strictures or benign neoplasms, which are usually discovered intraoperatively<sup>[4-6]</sup>.

Due to a significant risk of associated malignancy, which approximates 65%[7,8], radiologic decompression is not addressed preoperatively in adults. Therefore, 70 to 90% of adult cases of intussusception require definite

treatment, of which surgical resection is, most often, the treatment of choice<sup>[9]</sup>.

### Methodology

- We present our institutional experience in adult intussusception (>18 years) -a series of 17 cases over a period of 5 years
- Period of study 2015 to 2019
- Retrospectively data was collected
- Clinical presentation, Radiology, Intra-operative findings and Histopathology reports were reviewed
- Total of 17 adult patients were found to have intussusception and the data was analysed

### Results

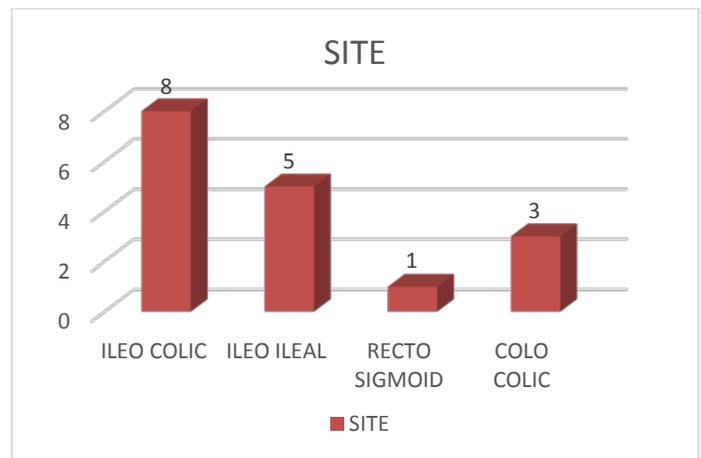
- Mean Age : 54.5
- Distribution:
- Among 17 patients 9 patients were females and 8 patients were male
- All the patients presented with features of intestinal obstruction and underwent CECT Whole abdomen as the diagnostic investigation and underwent- Surgery- Exploratory Laparotomy with resection and anastomosis.

Age range	No of patients
18-30	1
30-40	3
40-50	5
50-60	0
60-70	4
70-80	4

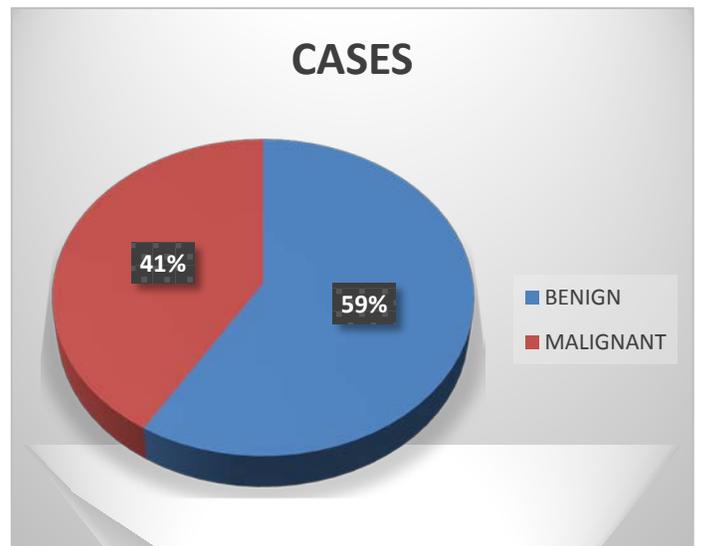
- In patients of age group < 40 years the benign pathologies like sub-mucosal lipomas and Ileo-Caecal tuberculosis were the common lead points.
- In patients of age group > 45 years the intussusception was more common due to malignant pathologies like Lymphoma, Adenocarcinomas and Neuroendocrine tumours.

#### Site of Intussusception

- Ileo-colic - 8
- Ileo-ileal - 5
- Recto sigmoid - 1
- Colo-colic – 3
- Of 17 cases, 8 patients had ileo-colic intussusception , 5 patients had ileo ileal, 3 Colo-colic and 1 recto-sigmoid intussusception .
- All the cases of colo-colic intussusception were found to be secondary to submucosal Lipomas as lead point.
- 2 out of 5 cases of ileo ileal intussusception was due to Lymphoma of small bowel and one case was secondary to neuro-endocrine tumour as lead point



#### Benign Vs Malignant



Out of 17 cases of intussusception, 10 cases (59%) were found to have benign pathology as lead point, whereas 7 cases (41%) had malignancy as lead point.

Most of the patients with **benign pathology** presented with **recurrent attacks of sub-acute intestinal Obstruction**.

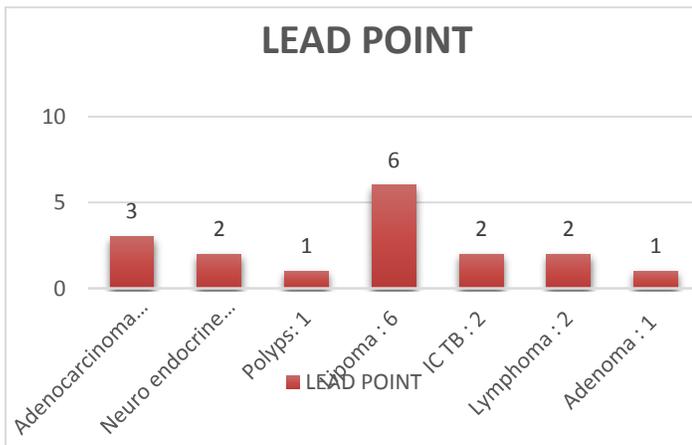
Most patients of **malignant pathology** were found to have **chronic non specific symptoms** of abdominal pain, Bleeding P/R and most of them presented with symptoms of acute bowel obstruction.

Patients with benign pathology underwent limited resection with primary anastomosis ,and malignant pathology underwent resection ensuring adequate clearance margins-following the oncological principle

### Pathological Lead Point

- Adenocarcinoma : 3
- Neuro endocrine tumour : 2
- Polyps: 1
- Lipoma : 6
- IC TB : 2
- Lymphoma : 2
- Adenoma : 1

Of 17 cases, 6 patients had Sub-Mucosal Lipoma as lead point, 3 had adenocarcinoma, 2 had Small bowel Neuro-Endocrine Tumour, 2 had IC Tuberculosis, 2 had Lymphoma and 1 patient had adenoma and 1 patient had Peutz-jeghers Polyps as lead point.



### Submucosal lipomas

- 6 out of 17 cases were found to have submucosal lipoma as pathological lead point.
- Mean age of presentation was found to be 54 years
- Most of the patients were found to have age <45 years (4 out of 6 cases).
- 3 cases were found to have colo-colic intussusception and 3 cases were found to have ileo-ileal intussusception
- All of them underwent limited resection and primary anastomosis as the treatment

### Adenocarcinoma

- 3 out of 17 patients were found to have adenocarcinoma of bowel as the pathological lead point.
- Mean age of presentation was found to be 71 years
- Two cases were found to have ileo-colic intussusception and 1 patient had recto-sigmoid intussusception.
- All of them underwent resection with adequate clearance margins based on oncology principles

### Lymphomas

- Two patients were found to have lymphoma as the lead point.
- Mean age of presentation was 44 years
- The mean duration of presentation of symptoms was 20 days.
- Both the patients had ileal lymphoma as the pathological lead point causing ileo-ileal intussusception
- They underwent resection with adequate clearance margins and primary anastomosis.
- Post-operative HPE showed Non-Hodgkin's Lymphoma- Plasmablastic type

### Neuroendocrine tumour

- Two patients had NET of small bowel as pathological lead point
- Mean age of presentation was 67.5
- One patient had ileo-ileal intussusception and the other case was ileo-colic intussusception
- Both patients underwent Resection and Primary anastomosis

### Ileo-caecal tuberculosis

- Two patients had Ileo-caecal Tuberculosis causing ileo-colic Intussusception
- Mean age of presentation was 47.5 years
- Both patients presented with symptoms of Obstipation for 3-5 days

- They underwent Right hemicolectomy and primary anastomosis

### Discussion

Intussusception is the telescoping of one segment of the gastrointestinal tract into an adjacent one.<sup>[10]</sup>

This condition is uncommon in adults, with two to three cases occurring in a population of 1 000 000 per annum<sup>[11]</sup> and accounts for less than 0.1% of all adult hospital admissions.<sup>[12,13]</sup>

In adults, 90% occur in the small or large bowel and, the remaining 10% involve the stomach or a surgically created stoma.<sup>[5]</sup>

### Mechanism/Pathophysiology

In adults, secondary intussusception is believed to initiate from any pathologic lesion of the bowel wall or irritant within the lumen that alters normal peristaltic activity and serves as a lead point, which is able to initiate an invagination of one segment of the bowel into the other<sup>[9,15]</sup>

However the exact mechanism of bowel intussusception is unknown (primary or idiopathic) in 8%-20% of cases and is more likely to occur in the small intestine<sup>[3,9,14]</sup>

Schematically, intussusception could be described as an “internal prolapse” of the proximal bowel with its mesenteric fold within the lumen of the adjacent distal bowel as a result of overzealous or impaired peristalsis, further obstructing the free passage of intestinal contents and, more severely, compromising the mesenteric vascular flow of the intussuscepted segment.

### Location-Etiology

The most common locations in the gastrointestinal tract where an intussusception can take place are the junctions between freely moving segments and retroperitoneally or adhesional fixed segments.<sup>[16]</sup>

Intussusceptions have been **classified according to their locations** into four categories<sup>[4,7,17]</sup>:

- (1) entero-enteric, confined to the small bowel,
- (2) colo-colic, involving the large bowel only,
- (3) ileo-colic, defined as the prolapse of the terminal ileum within the ascending colon
- (4) ileo-cecal, where the ileo-cecal valve is the leading point of the intussusception

Intussusceptions have also been classified according to **etiology** (benign, malignant or idiopathic).

Malignancy (adenocarcinoma) accounts for up to 30% of cases of intussusception occurring in the small intestine

On the other hand, intussusception occurring in the large bowel is more likely to have a malignant etiology and represents up to 66% of the cases<sup>[9,15,18]</sup>.

### Clinical Presentation

The clinical presentation of adult intussusception varies considerably.

The presenting symptoms are nonspecific and the majority of cases in adults have been reported as chronic, consistent with partial obstruction<sup>[3,19]</sup>

The classic pediatric presentation of acute intussusception (a triad of cramping abdominal pain, bloody diarrhea and a palpable tender mass) is rare in adults.

Nausea, vomiting, gastrointestinal bleeding, change in bowel habits, constipation or abdominal distension are the nonspecific symptoms and signs of intussusception<sup>[4,7]</sup>

Intussusception in adults can be further classified according to the presence of a lead point or not<sup>[20]</sup>

**transient non-obstructing intussusception without a lead point** has been described in patients with celiac or Crohn’s disease, but is more frequently idiopathic and resolves spontaneously without any specific treatment.<sup>[21]</sup>

On the other hand, **intussusception with an organic lesion as the lead point** usually presents as a bowel

obstruction, persistent or relapsing, necessitating, however, a definite surgical therapy.

### **Diagnosis-Imaging**<sup>[18,23-28]</sup>

Variability in clinical presentation and imaging features often make the preoperative diagnosis of intussusception a challenging and difficult task. Reijnen *et al*<sup>[22]</sup> reported a preoperative diagnostic rate of 50%, while Eisen *et al*<sup>[18]</sup> reported a lower rate of 40.7%.

Plain abdominal films are typically the first diagnostic tool, since in most cases the obstructive symptoms dominate the clinical picture, films usually demonstrate signs of intestinal obstruction and may provide information regarding the site of obstruction

Upper gastrointestinal contrast series may show a “stacked coin” or “coil-spring” appearance, while a barium enema examination may be useful in patients with colo-colic or ileo-colic intussusception, which shows a “cup-shaped” filling defect or “spiral” or “coil-spring”, “claw sign” appearances are characteristic

Ultrasonography is considered a useful tool for the diagnosis of intussusception, both in children and in adults. The classical imaging features include the “target” or “doughnut” signs on the transverse view and the “pseudo-kidney” sign or “hay-fork” sign in the longitudinal view.

Abdominal computed tomography (CT) is currently considered as the most sensitive radiologic method to confirm intussusception, with a reported diagnostic accuracy of 58%-100%. The characteristic features of CT scan include an unhomogeneous “target” or “sausage”-shaped soft-tissue mass with a layering effect mesenteric vessels within the bowel lumen are also typical<sup>[9]</sup>.

### **Diagnosis-Endoscopy**

Flexible endoscopy of the lower GI tract is considered valuable in evaluating cases of intussusception presenting with subacute or chronic large bowel obstruction<sup>[9]</sup>

Confirmation of the intussusception, localization of the disease and demonstration of the underlying organic lesion serving as a lead point are the main benefits of endoscopy.

Snare polypectomy is not advisable in individuals with chronic intussusception presenting with a polypoid mass on barium or endoscopic examination, due to the high risk of perforation occurring in a background of chronic tissue ischemia and possible necrosis of the intussuscepted bowel segment's wall<sup>[29,30]</sup>

In the case of a lipoma as a lead point of an intussusception, typical colonoscopic features include a smooth surface, the “cushion sign” or pillow sign” (forcing the forceps against the lesion results in depression of the mass) and the “naked fat sign” (fat extrusion during biopsy)<sup>[31,32,33]</sup>

### **Surgical Treatment**

Due to the fact that adults present with acute, subacute, or chronic nonspecific symptoms, the initial diagnosis is missed or delayed and is established only when the patient is on the operating table<sup>[8]</sup>

Most of the cases of adult intussusception requires surgical intervention because of the large proportion of structural anomalies and the high incidence of occurring malignancy<sup>[9]</sup>

In contrast to pediatric patients, where intussusception is primary and benign, preoperative reduction with barium or air is not suggested as a definite treatment for adults.<sup>[9,18,34]</sup>

The theoretical risks of preliminary manipulation and reduction of an intussuscepted bowel include<sup>[3,4,9,18,22]</sup>:

- (1) Intraluminal seeding and venous tumor dissemination,
- (2) Perforation and seeding of microorganisms and tumor cells to the peritoneal cavity
- (3) Increased risk of anastomotic complications

Therefore, in patients with ileo-colic, ileo-cecal and colocolic intussusceptions, especially those more than 60 years of age, due to the high incidence of bowel malignancy as the underlying etiologic factor, formal resections using appropriate oncologic techniques are recommended, with the construction of a primary anastomosis between healthy and viable tissue<sup>[7,9,18,22,33,35]</sup>.

Azar *et al* report that, for right-sided colonic intussusceptions, resection and primary anastomosis can be carried out even in unprepared bowels, while for left-sided or rectosigmoid cases resection with construction of a colostomy and a Hartmann's pouch with re-anastomosis at a second stage is considered safer, especially in the emergency setting<sup>[3]</sup>

### Conclusion

Adult bowel intussusception is a rare but challenging condition for the surgeon.

Preoperative diagnosis is usually missed or delayed because of nonspecific and often subacute symptoms, without the pathognomonic clinical picture associated with intussusception in children.

Abdominal CT is considered as the most sensitive imaging modality in the diagnosis of intussusception and distinguishes the presence or absence of a lead point.

Due to the fact that adult intussusception is often frequently associated with malignant organic lesions, surgical intervention is necessary.

Treatment usually requires formal resection of the involved bowel segment

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