

## Intussusception of the Bowel in Adults

HJ MAJID, HM DAR, M SHAFI, M ARIF JAVED

*Department of Surgery, Shaikh Zayed Hospital and Federal Post-graduate Medical Institute, Lahore*

*Correspondence to: Dr. Haroon Javaid Majid FRCSEd, Associate Professor, Department of Surgery, Shaikh Zayed Hospital & Federal Postgraduate Medical Institute, Lahore*

### ABSTRACT

**Aim:** We report our experience in managing adult patients with bowel intussusception with a view to create awareness and bring about improvements in the diagnosis and management of this uncommon condition.

**Patients and Methods:** A critical review of the complete medical records of all adult (older than 18 years) patients with intussusception who were operated by us over an 11 year period (2000 - 2010).

**Results:** The total number of adult patients who underwent surgery for intussusception over the study period was 16. The average age of the patients was 28 years (range 18 - 43). Abdominal pain and vomiting were the commonest presenting symptoms. Eight (50%) patients had acute symptoms (less than 3 days), 2 (12.5%) had sub-acute symptoms (between 3 to 15 days) while 6 (37.5%) patients had chronic symptoms (more than 15 days). The mean duration of symptoms was 4.2 days (range, 1 day to 5 months). CT of the abdomen and pelvis was done in 9 (56.25%) patients and led to a pre-operative diagnosis of bowel intussusception in 8 (88.88%) of these patients. Overall, intussusception was diagnosed pre-operatively in 11 (68.75%) patients and in 7 (43.75%) patients the diagnosis was made at the time of laparotomy. The commonest location for the intussusception was in the small bowel i.e. 12 patients (75%), Jejunojejunal being the commonest type (58.3 % of the 12 patients with small bowel intussusception) while ileoileal intussusception was seen only in 2 patients. Colocolonic site was seen in 2 patients. There was only one patient with Sigmoidorectal intussusception and another patient with ileocaecal colic and appendicocaecal intussusception. A definite pathological cause (lead point) could not be found in 1 patient with small bowel intussusception. All the patients with small bowel intussusception in our series had benign lesions while all the colonic intussusceptions had malignant lead points, i.e. primary adenocarcinoma and lymphoma. All the patients in our series underwent surgery with resection of the effected segment of bowel. There were no deep surgical site infections or anastomotic leaks seen in any of our patients and neither was there any peri-operative mortality in this series.

**Conclusion:** Intussusception of the bowel is infrequently seen in our adult population. Awareness regarding this rare entity and a high index of suspicion, especially in adult patients presenting with sub-acute or chronic symptoms of bowel obstruction, should lead to an early diagnosis and prompt treatment of the condition. Abdominal CT is the most sensitive imaging modality. Surgical intervention and formal resection of the involved bowel segment is always necessary in adult patients.

**Key words:** Adult, Intussusception, Diagnosis, Management, Surgery

### INTRODUCTION

Intussusception is defined as the telescoping of a proximal segment of the gastrointestinal tract, called intussusceptum, into the lumen of the adjacent distal segment of the gastrointestinal tract, called intussusciens.

Intussusception is uncommon in adults compared with the pediatric population and represents a rare form of bowel obstruction in the adult. It is estimated that only 5% of all intussusceptions occur in adults and approximately 5% of bowel obstructions in adults are the result of intussusception<sup>1,2</sup>. Childhood intussusception is

idiopathic in 90% of cases while adult intussusception has a demonstrable lead point, which is a well-definable pathological abnormality in 70%-90% of cases<sup>2-4</sup>. It is now widely accepted that adult intussusception warrants surgical resection because the majority of patients have underlying intraluminal lesions<sup>5</sup>.

### AIMS AND OBJECTIVES

We report our experience with a view to create awareness and bring about improvements in the diagnosis and management of this uncommon condition.

## PATIENTS AND METHODS

A critical review of the complete medical records of all adult (older than 18 years) patients with intussusception who were operated by the Surgical Unit II team in Shaikh Zayed Hospital and Federal Post-graduate Medical Institute over an 11 year period (2000 - 2010) was done. The clinical, operative, and pathology records of these patients were studied in detail. All patients with Rectal Prolapse, two patients with stomal prolapse and one patient with gastrojejunal intussusception subsequent to a pylorus preserving pancreaticoduodenectomy and who was relieved by endoscopic insufflation, were excluded from this study.

Intussusception was classified as,

1. Jejunojejunal, ileoileal or ileocolic, when the pathologic lead point was located in the small bowel
2. Colonic, including colocolonic and sigmoidorectal intussusception, when the lead point was located in the large bowel.
3. Ileocecal-colic, when the lead point was at the ileocecal valve.
4. Appendicocecal.

## RESULTS

The total number of adult patients who underwent surgery for intussusception over the study period was 16. The average age of the patients was 28 years (range 18 - 43). There were 12 (75%) male patients and 4 (25%) females. Eleven (68.75%) patients were operated as emergencies at odd hours while 5 (31.25%) were operated on a semi-elective/emergency basis on the morning elective lists.

Table 1. Symptoms and Signs (N=16).

Symptoms and Signs	Number of patients (%)
Abdominal Pain	14 (87.5%)
Palpable Mass	07 (43.75%)
Abdominal Tenderness	08 (50%)
Nausea	13 (81.25%)
Vomiting	13 (81.25%)
Constipation	11 (68.75%)
Diarrhea	03 (18.75%)
Fever	03 (18.75%)
Rectal Bleeding	02 (12.5%)

Abdominal pain and vomiting were the commonest presenting symptoms. Table 1 shows the symptoms and signs in detail. A palpable abdominal mass was present in 7 patients. Eight (50%) patients had acute symptoms (less than 3 days), 2 (12.5%) had sub-acute symptoms (between 3 to 15 days) while 6 (37.5%) patients had chronic symptoms (more than 15 days). The mean duration of symptoms was 4.2 days (range, 1 day to 5 months).

Table 2. Location of Intussusception (N=16).

Location	Number of patients (%)
Jejunojejunal	7 (43.75%)
Ileoileal	2 (12.5%)
Ileocolic,	3 (18.75%)
colocolonic	2 (12.5%)
sigmoidorectal	1 (6.25%)
Ileocecal-colic with Appendicocecal	1 (6.25%)
TOTAL	16

Table 3. Pathological causes of Intussusception (N=16).

Causes of Intussusception/ Lead Points	No. of patients (%)
Fibroid Polyp	03
Submucosal Lipoma	01
Small Bowel Leiomyomas	03
Lymphoid Hyperplasia	01
Peutz Jeghers Polyps	02
Meckel's Diverticulum	01
Primary Colonic Adenocarcinoma	02
Primary Colonic Lymphoma	01
Ileocecal Tuberculosis along with Tuberculous Mesenteric Lymphadenitis	01
Idiopathic (No definite lead point found)	01

Samples for routine hematological and biochemical testing were taken in all patients. Plain erect and supine X-rays of all the patients revealed radiological findings suggestive of bowel obstruction (air fluid levels) in 7 (43.75%) patients. Emergency and/or departmental ultrasound of the abdomen and pelvis was done in all the patients and raised suspicion of intussusception in 3

(18.75%) patients. Ultrasound provided a clear pre-operative diagnosis in only 1 patient. CT of the abdomen and pelvis was done in 9 (56.25%) patients and led to a pre-operative diagnosis of bowel intussusception in 8 (88.88%) of these

patients. Typical finding on the CT was the sausage shaped in-homogenous mass. A contrast meal follow through evaluation was carried out in 5 patients and confirmed a diagnosis of intussusception in 3 (60%) patients (Figure XR1).

Table 4. Surgical procedures.

Location	Surgical Procedure (No.)
Jejunojejunal	Resection and end to end anastomosis - 7
Ileoileal	Resection and end to end anastomosis - 2
Ileocolic,	Right Hemicolectomy with end to end ileocolic anastomosis – 2
	Extended Right Hemicolectomy with end to end ileocolic anastomosis - 1
colocolonic	Extended Right Hemicolectomy with end to end ileocolic anastomosis - 1
	Left Hemicolectomy with end colostomy and mucous fistula - 1
Sigmoidorectal	L Colonic resection with end colostomy (Hartmann’s) - 1
Ileocecal-colic with Appendicocecal	Extended Right Hemicolectomy with end to end ileocolic anastomosis - 1
TOTAL	16



Figure XR1. Barium Meal Follow Through – small bowel intussusception (Black arrow).

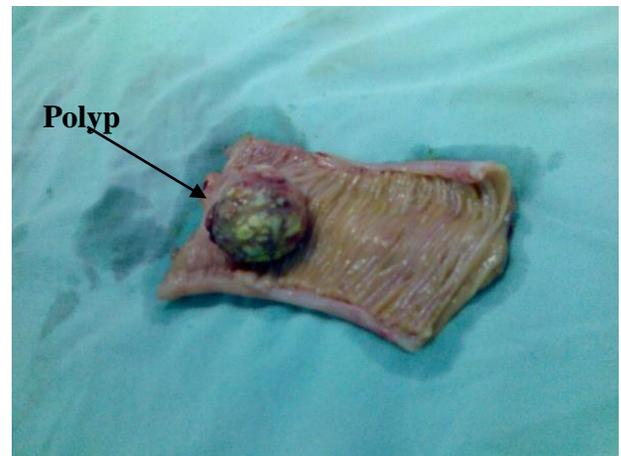


Figure 1b.



Figure 1a. Jejunojejunal Intussusception



Figure 1c. Ileoileal Intussusception

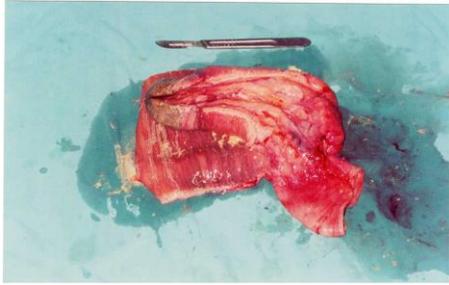


Figure 1d. Ileoileal intussusception

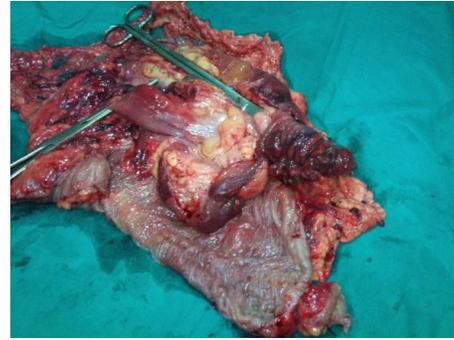


Figure 5 Appendicocecal Intussusception within Ileocecal-colic Intussusception (Scissor tip is inserted within the inverted appendiceal lumen)



Figure 2. Initial impression of Ileocolic Intussusception.



Figure 3. Ileocecal Colic Intussusception with complete inversion of the Appendix.



Figure 4. Appendicocecal Intussusception within Ileocecal-colic Intussusception

Colonoscopy was done pre-operatively in 2 patients and flexible sigmoidoscopy was carried out in 1 patient. Only in one patient was the colonoscopy helpful in complementing the pre-operative diagnosis. Colonoscopy or sigmoidoscopy was found to be of no therapeutic benefit to any of these patients. Overall, intussusception was diagnosed pre-operatively in 11 (68.75%) patients and in 7 (43.75%) patients the diagnosis was made at the time of laparotomy. Six patients among those in whom the diagnosis was made during surgery had pre-operative signs suggestive of bowel strangulation and were taken to theatre after routine labs and X-rays and detailed and time consuming sophisticated imaging was not done.

The location of the intussusception in all our patients is shown in Table 2.

The commonest location was in the small bowel i.e. 12 patients (75%), Jejunojejunal being the commonest type (58.3 % of the 12 patients with small bowel intussusception) (Figures 1a and 1b) while ileoileal intussusception was seen only in 2 patients (Figures 1c and 1d).

Colocolonic site was seen in 2 patients. There was only one patient with Sigmoidorectal intussusception who was initially mistaken in the emergency room as a case of complete rectal prolapse.

Another patient who was initially mistaken as a case of ileocolic intussusception at the time of surgery (Figure 2) was discovered to have ileocecal-colic intussusception when the resected specimen was opened up (Figure 3). This same patient was also found to have a complete inversion and invagination of the appendix into the cecal lumen and thus forming part of the intussusceptum (Figures 4 and 5). As we found

both the ileocecal valve area and the internal lumen of the appendix as well as the intervening cecal wall involved in the pathological process acting as a lead point, we classified this patient with suffering from ileocaecal colic and appendicocaecal intussusception at the same time.

Pathological causes of intussusception in all the patients in our series are shown in table 3. A definite pathological cause (lead point) could not be found in 1 patient with small bowel intussusception. All the patients with small bowel intussusception in our series had benign lesions while all the colonic intussusceptions had lead points which were malignant i.e. primary adenocarcinoma and lymphoma. One patient classified as having ileocecal colic intussusception along with complete intraluminal invagination of the appendix had Peutz Jeghers Polyps. Another patient with ileocolic intussusception had matted caseating tuberculous lymph nodes at the ileocaecal junction secondary to ileocaecal tuberculosis.

All the patients in our series underwent surgery and were explored through midline incisions. All the patients with small bowel intussusception had resections followed by end to end anastomosis. The intussusception was reduced on table prior to a resection in 3 of these patients. The choice of surgical procedure was tailor made according to every patient and determined by the location, size and cause of the intussusception and the viability of the involved bowel. Table 4 summarizes the procedures carried out in our patients

The two patients in this series who had colostomies at the time of the primary resection underwent reversal of colostomy with end to end anastomosis at one and a half and 3 months respectively.

Diagnostic laparoscopy preceding laparotomy was performed in two patients and helped in confirming the diagnosis of small bowel intussusception. Resection of the effected segment of bowel was immediately carried out by open surgery in both these patients.

Post-operative complications in our patients were superficial wound infection in 5 patients (31.25%), chest infection in 2 patients (12.5%), Deep Vein Thrombosis in one patient (6.25%) and a blood transfusion reaction in one patient. There were no deep surgical site infections or anastomotic leaks seen in any of our patients and neither was there a peri-operative mortality in this series.

## DISCUSSION

Adult intussusception is rare (only 5% of all cases of intestinal obstructions in adults) as compared to pediatric intussusception<sup>1,6,7</sup>. The rarity of this condition is highlighted by the fact that our team operated upon only 16 cases of adult bowel intussusception during the 11 years study period.

A review of literature shows that approximately 90% of adult bowel intussusception is secondary to some identifiable lead point.<sup>1,6-8</sup> We found a definite identifiable lead point in 93.75% (15/16) of our patients.

All the patients with small bowel intussusception in our series had benign lesions while all the colonic intussusceptions had lead points which were malignant i.e. primary adenocarcinoma and lymphoma. This conforms with the results of many other authors<sup>3,5,6,8,9</sup>. We found no association between the occurrence of adult intussusception and the period during and immediately after the holy month of fasting (Ramadan) as reported by some authors in the past<sup>10,11</sup>.

Almost half of our patients had sub-acute or chronic symptoms of bowel obstruction at the time of presentation. Abdominal pain with nausea and vomiting were the commonest presenting symptoms in our patients as also reported by many other authors<sup>2,3,8</sup>. A palpable abdominal mass was present in 7 (43.75%) of the patients in our series although this finding was rare in the experience of some recent authors (only 5% in the series of adult patients of Yakan et al)<sup>8</sup>. However, many other authors have found the incidence of a palpable abdominal mass in 24% - 42% of patients<sup>2,3,5</sup>.

CT of the abdomen and pelvis has been reported to be the most useful investigation for the diagnosis of bowel intussusception and is superior to other contrast studies, ultrasonography, or endoscopy<sup>12-15</sup>. Similarly, double contrast CT of the abdomen and pelvis was found to be the most useful diagnostic tool in our series with a diagnostic accuracy of 88.88%. The reported diagnostic accuracy of CT for adult intestinal intussusception is 58%-100%<sup>2,6,13,16</sup>.

All our patients underwent laparotomy and resection of the bowel. Three patients with small bowel intussusception had initial reduction of the intussusception during laparotomy followed by a more limited resection. The remainder had en-bloc resection of the effected segment of bowel without reduction. Prior reduction was attempted only in patients with small bowel intussusception because

of the low possibility of a malignant lead point<sup>3,17</sup>. The high incidence of an underlying primary malignancy when the large bowel is involved makes en-bloc resection without an attempt at prior reduction mandatory<sup>8</sup>.

Although there are reports of laparoscopic small bowel resection because of intussusception in the literature, we only used diagnostic laparoscopy in two patients prior to laparotomy and resection of the effected bowel<sup>18,19</sup>.

## CONCLUSION

Intussusception of the bowel is infrequently seen in our adult population. Awareness regarding this rare entity and a high index of suspicion, especially in adult patients presenting with sub-acute or chronic symptoms of bowel obstruction, should lead to an early diagnosis and prompt treatment of the condition.

Preoperative diagnosis is usually missed or delayed because of obscure or nonspecific and often subacute symptoms. Abdominal CT is the most sensitive imaging modality in the diagnosis of intussusception and may also help to distinguish the presence or absence of a lead point. As adult intussusception is frequently associated with malignant lesions, surgical intervention and formal resection of the involved bowel segment is always necessary. Reduction can be attempted in selected cases of small bowel intussusception as long as the segment involved is considered to be viable or an underlying malignant lesion is not suspected is not suspected.

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