



## Original Article

# Adult Intussusception: Diagnosis and Management Strategies. 10 Years Experience from North India

Authors

**Javid Iqbal\* MS FMAS, FIAGES<sup>1</sup>, Yasmeen Kousar MBBS, DGO<sup>2</sup>,  
Lileswar Kaman, MS, MRCS<sup>3</sup>, Rajinder Singh, MS<sup>4</sup>**

<sup>1</sup>Lecturer, Department of General Surgery, Government Medical College Jammu, J&K, India

<sup>2</sup>Medical Officer, Department of Health and Family Welfare, Jammu, J&K, India

<sup>3</sup>Professor, Department of General Surgery

Post Graduate Institute of Medical Education and Research, Chandigarh, India

<sup>4</sup>Ex Professor and Head, Department of General Surgery

Post Graduate Institute of Medical Education and Research Chandigarh, India

\*Corresponding Author

**Javid Iqbal**

Department of General Surgery, Government Medical College Jammu, J&K, India 180005

Phone: 9596620409, Email: [javidiqbal123@gmail.com](mailto:javidiqbal123@gmail.com)

## Abstract

**Background and aims:** *Adult intussusception is a rare clinical presentation and often not considered clinically in patients with vague abdominal complaints. Even if the diagnosis is established, the optimal management of this problem remains controversial.*

**Materials and Methods:** *The clinical, diagnostic, operative and pathological data of 25 patients of adult intussusception was collected prospectively between June 2007 to June 2017 at two tertiary health centers of North India and was analyzed for varied clinical spectrum, diagnostic techniques and surgical treatment.*

**Results:** *Twenty five patients of adult intussusception aged between 18-82 years were included in this study. Most common presenting complaint was pain abdomen in 21/25 patients (84%) followed by nausea and vomiting. CT scan established preoperative diagnosis in 87.5% cases. All patients underwent surgical treatment and there was no mortality in our series. Pathological lead point was detected in 21/25 patients, in one patient it was due to feeding tube and etiology was not detected in three patients. No case with malignant lead point was detected in enteric intussusception group as compared to four cases in colonic intussusception group.*

**Conclusion:** *CT scan the most sensitive investigation for preoperative diagnosis. Enteric intussusception should be reduced when the underlying etiology is suspected to be benign or the resection is massive without reduction. But not the colonic intussusception as etiology is malignant in most cases.*

**Keywords:** *Adult intussusception, intussusceptum, computed tomography, reduction, surgery.*

## Introduction

Adult intussusception (AI) occurs infrequently, accounting for only 1% of all cases of intestinal obstructions and 5% of all intussusception<sup>[1,2]</sup>. In contrast to childhood intussusception, which is idiopathic in 90% of cases, adult intussusception has a demonstrable lead point, with well defined pathological abnormality in 70%-90% of cases<sup>[3-5]</sup>. Adult intussusception often presents with nonspecific symptoms. Preoperative diagnosis remains difficult and the extent of resection and whether the intussusception, should be reduced or not remains controversial<sup>[6]</sup>. The purpose of this study was to evaluate the clinical spectrum, preoperative diagnostic techniques and surgical approach to adult intussusception.

## Materials and Methods

The clinical, diagnostic, operative and pathological data of 25 patients of adult intussusceptions treated at two tertiary health centers in North India was collected prospectively from June 2007 to June 2017. We divided patients into two groups: enteric intussusceptions and colonic intussusceptions. Enteric intussusception was considered if the lead point (intussusceptum) and distal bowel lumen (intussusciens) solely involved the jejunum or ileum including jejunojejunal, jejunoileal and ileoileal. Intussusception caused by a lesion that involved the ileum and cecum was designated as colonic intussusception. Colonic intussusception included ileocecal-colic, colocolonic, sigmoidorectal and appendicececal intussusception. Ileocolic and ileocecal-colic intussusception was distinguished by the site of the pathological lead point. When the lead point was at the ileum, intussusception was classified as ileocolic, whereas when the lead point was at the ileocecal valve, it was classified as ileocecal-colic. Acute symptoms were defined as < 4 days, subacute symptoms were defined as 4-14 days, and chronic symptoms were defined as > 14 days. Reduction was attempted in enteric intussusceptions where bowel was not gangrenous and not in colonic intussusceptions. All lesions

were subdivided into benign and malignant categories according to the histopathology report.

## Results

A total of 25 patients diagnosed to have adult intussusception on radiology, colonoscopy or surgery were included in this study. The age of patients range from 18 – 82 years. Fourteen were male and 11 females (Table 1). Most common presenting complaint was pain abdomen in 21 patients (84%) followed by nausea, vomiting, abdominal mass, anemia, constipation and fever as shown in table 2. The duration of symptoms ranges from 8 hours to 2 months. Six patients (24%) presented with acute symptoms, seven patients (28 %) with subacute symptoms, 11 patients (44%) with chronic symptoms and one patient (4%) patient was asymptomatic and diagnosed incidentally on colonoscopy during workup for anemia.

Plain abdominal X-rays were performed in patients with acute symptoms, which revealed air-fluid levels that suggested intestinal obstruction in five patients. It was normal in the other 20 patients. Intussusception was diagnosed preoperatively in 22 patients (88%). Three patients (15.7%) were diagnosed during surgery and these patients showed signs of acute intestinal obstruction on abdominal x rays and were transferred to the operating room without further radiological evaluation. Intussusception was diagnosed on USG abdomen in five (55.5%). Abdominal computed tomography (CT) scan was performed in 16 patients with clinical suspicion of intussusception and among them 14 patients (87.5%) were diagnosed with intussusception (Table 1). The finding on CT was an inhomogeneous soft-tissue mass that was target or sausage-shaped. Four patients underwent colonoscopy, one for chronic anemia and three for bleeding per rectum and intussusception was diagnosed in two patients on colonoscopy. One patient was diagnosed to have duodenal intussusceptions on barium meal. Twenty one patients were diagnosed preoperatively and four

during surgery, all patients underwent surgical treatment for intussusceptions. Enteric intussusception was diagnosed in 15 patients and colonic in 10 patients (ileocolic in seven and colocolic in three patients). The pathological

cause of intussusception was identified in 21 (84%) cases (Table 1 and 3). Benign pathology was seen in 17 cases (68%) and malignancy in four (16%), idiopathic in three patients (12%) and due to feeding tube in one patient (4%) (Table 3).

**Table 1:** Diagnostic investigations, location and histopathology of 25 patients of adult intussusception

S. No.	Age/Sex	Diagnosis +	Type	Reduction	Histopathology
1	47/F	+CECT	Colo-colic	No	Sub mucosal lipoma
2	38/M	+Laparotomy	Ileo-colic	No	Mesenteric lymphadenitis with gangrene
3	49/F	+CECT	Ileo-colic	No	Inflammatory fibroid polyp
4	62/M	-USG +CECT	Ileo-ileal	Yes	Inflammatory fibroid polyp
5	82/M	+Laparotomy	Ileo-ileal	Failed	Inflammatory fibroid polyp
6	35/F	+CECT	Ileocecal	No	Ileal lipoma
7	25/M	+USG	Ileocolic	No	Inflammatory bowel disease with necrosis
8	35/M	+CECT	Jejuno-jejunal	Yes	Feeding jejunostomy tube
9	17/M	+USG	Ileo-ileal	No	Idiopathic
10	50/F	+CECT	Ileo-ileal	Yes	Mekel's diverticulum
11	40/F	+CECT	Jejuno- jejunal	Yes	Peutz jegher polyp
12	28/M	-Colonoscopy, +CECT	Ileocolic	No	Idiopathic
13	16/F	+USG	Jejuno- jejunal	Yes	Peutz jegher polyp
14	26/ M	-Colonoscopy, +CECT	Ileocolic	No	Small bowel lymphoma
15	62/F	+Barium meal +CECT	Duodeno- duodenal	Yes	Adenomatous polyp
16	60/F	-USG, -CECT	Ileoileal	Yes	Inflammatory myofibroblastic tumor
17	74/M	+Colonoscopy	Colocolic	No	Adenocarcinoma
18	56/M	+Colonoscopy -CECT	Colocolic	No	Adenocarcinoma
19	38/M	+Laparotomy	Ileoileal	Yes	Small bowel hemartoma
20	22/M	+USG	Jejuno- jejunal	Yes	Peutz jegher polyp
21	45/F	+USG	Ileocolic	No	Adenocarcinoma
22	20/M	-USG +CECT	Ileoileal	Yes	Mekel's diverticulum
23	39/F	+CECT	Jejuno ileal	Yes	Adhesions
24	50/F	-USG +CECT	Ileoileal	Yes	Idiopathic
25	41/M	+CECT	Ileocolic	No	Enteric fever enteritis

USG- Ultrasonography, CECT- Contrast enhanced computed tomography, +-Diagnosed on,

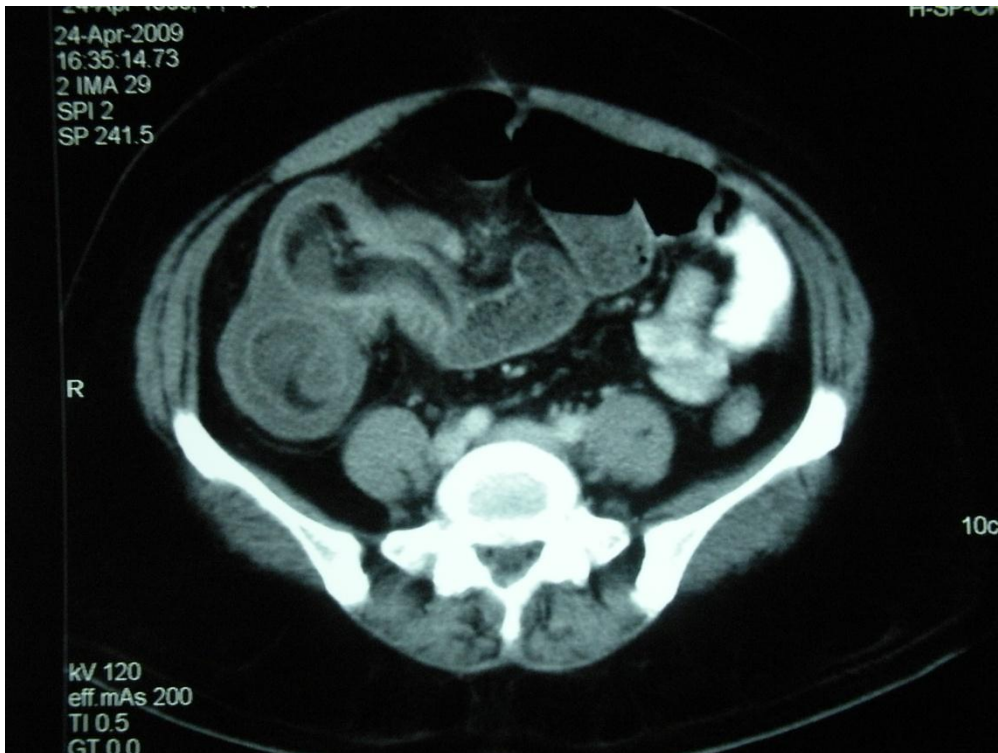
**Table 2:** Symptoms and signs of intussusception

Symptoms and signs	N (%)
Pain	21 (84%)
Nausea	18 (72%)
Vomiting	13 (52%)
Rectal bleeding	6 (24%)
Abdominal mass	2 (8%)
Constipation	2 (8%)
Fever	2 (8%)
Chronic anemia	1(4%)

**Table 3:** Etiologies according to location of intussusceptions

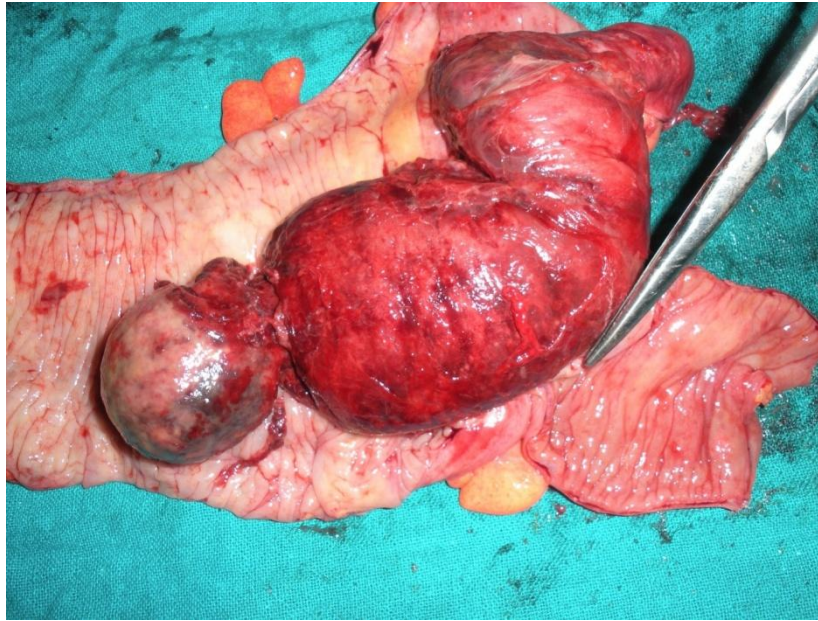
Location	Benign (N)	Malignant (N)	Total (%)
Enteric	Peutz-Jegher syndrome (3) Inflammatory fibroid polyp (2) Meckel's diverticulum (2) Ileal Harmatous polyp (1) Inflamatory myofibroblastic tumor (1) Adenomatous polyp (1) Feeding tube (1) Enteric fever enteritis 1 Adhesions 1 Idiopathic (2)	None (0)	15(60 %)
N=15/15(100%)			
Colonic		10(40%)	
Ileocolic	Ileal Lipoma (1) Mesentric lymphadenitis (1) Inflammatory fibroid polyp (1) Inflamatory bowel disease (1) Idiopathic (1)	Ileal lymphoma (1) Adenocarcinoma (1)	
	N=5/7(71.4%)	N=2/7(28.5%)	
Colocolic	Submucosal Lipoma (1)	Adenocarcinoma (2)	
	N=1/3(33.3%)	N=2/3(66.6%)	
Total	N= 21/25(84%)	N= 4/25(16%)	

**Figure 1:** CECT abdomen showing ileocecal intussusception.





**Figure 2:** Lay open specimen of ileocecal intussusception showing lead point.



### Discussion

Intussusception occurs when a segment of bowel (intussusceptum) telescopes into the segment adjacent to it (intussuscipiens). The condition occurs more frequently in children, where enlarged Peyer's patches are the most common lead-point for the intussusception. In children, the condition is often managed non-operatively with pneumatic reduction. In contrast, intussusception in adults is rare, accounting for 5% of all intussusceptions and 1% of bowel obstructions [3]. In > 90 percent of cases, an identifiable lesion resulting in a lead point is demonstrable [7], with neoplasm accounting for 65 percent [1]. In general, the majority of lead points in the small intestine consist of benign lesions, such as benign neoplasms, inflammatory lesions, Meckel's diverticuli, appendix, adhesions, and intestinal tubes. Malignant lesions (either primary or metastatic) account for up to 30% of cases of intussusception in the small intestine [4,7]. 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 [4,7,8,9]. In our study malignant etiology was detected in 40% cases of colonic intussusception and none in enteric intussusception. The clinical presentation in adult intussusceptions is often chronic and most patients present with nonspecific symptoms that

are suggestive of intestinal obstruction. Forty four percent of our patients presented with chronic symptoms. Abdominal pain is the most common symptom followed by nausea and vomiting [3,4]. Abdominal masses are palpable in 24%-42% of patients, and identification of a shifting mass or one that is palpable only when symptoms are present is suggestive of intussusception or volvulus [3,4,7]. In our series, 84% patients presented with pain abdomen and abdominal mass was only palpable in 2 patients (8%). The classic pediatric presentation of intussusception, abdominal pain, mass, blood per rectum, is rarely found in adult population [3,4,9] and we have not encountered this triad in any of our patients. Imaging techniques may help to identify the causative lesion preoperatively. Plain abdominal X-ray is usually the first diagnostic test performed in most of patients [1]. Contrast studies can help to identify the site and cause of the intussusception, particularly in chronic cases. Upper gastrointestinal series may show stacked coin'' or coiled spring'' appearance [9]. Barium enema examination may be useful in patients with colonic or ileocolic intussusception in which a cup-shaped filling defect is a characteristic finding [9]. Colonoscopy is also a useful tool for evaluating intussusception, especially when the presenting symptoms indicate a large bowel

obstruction <sup>[4,10,11,12]</sup>. It may not be advisable to perform endoscopic biopsy or polypectomy in those individuals with long-term symptoms because of the high risk of perforation, which is more likely to happen in the phase of chronic tissue ischemia, and perhaps necrosis because of vascular compromise in intussusception<sup>[13]</sup>. Ultrasonography is considered a useful tool for the diagnosis of intussusception, both in children and in adults <sup>[12,14,15]</sup>. 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 <sup>[15,16]</sup>. But, this procedure is operator dependent and need an experienced radiologist, in order to confirm the diagnosis. However, obesity and the presence of massive air in the distended bowel loops limit the image quality and the subsequent diagnostic accuracy. Recently, with the target or sausage sign, abdominal CT scan has been reported to be the most useful imaging technique, with a diagnostic accuracy is 58%-100% <sup>[2,7,8, 12,17-19]</sup>. In our series 86.6% patients were diagnosed preoperatively by this technique. The optimal treatment for adult intussusception has not been established till date. Most authors are in favour of laparotomy, based on the likelihood of an underlying pathologic lesion <sup>[3,20]</sup>. There has been controversy associated with the option of preliminary reduction of intussusception before resection verses primary resection without reduction. The theoretic objections to reduction of grossly viable bowel with mucosal necrosis are: 1, intraluminal seeding and venous embolization of malignant cells in the region of ulcerated mucosa <sup>[21]</sup>. 2, possible perforation during manipulation <sup>[5,9]</sup>. 3, increased risk of anastomotic complications in the face of edematous and inflamed bowel <sup>[5,9]</sup>. Reduction should not be attempted if there are signs of bowel ischemia or inflammation <sup>[7]</sup>. Based on high incidence of an underlying malignancy, which may be difficult to confirm intraoperatively, many authors recommend primary resection whenever possible <sup>[5,3]</sup>. For colonic intussusception, most recent

reports recommend a selective approach to resection, keeping in mind that the site of intussusceptions tends to correlate with the lesion being benign or malignant <sup>[9,4]</sup>. On the other hand, some authors have recommended a selective approach to resection, taking into consideration the site of intussusception, which influences the type of pathology <sup>[4, 21]</sup>. They advocate resection of all colonic lesions but a more selective approach for small bowel pathology, as the lower malignancy rate for small bowel intussusception makes the argument for initial resection less convincing <sup>[19]</sup>. Recently, minimally invasive techniques have been used for the treatment of small or large bowel obstructions, specifically the diagnosis and treatment of adult intussusception. There are several case reports about laparoscopic small bowel resection for intussusception <sup>[22, 23]</sup>. The choice of using a minimally invasive or open approach depends on the clinical condition of the patient, the location and extent of intussusception, the possibility of underlying disease, and the availability of surgeons with sufficient laparoscopic expertise <sup>[24,25]</sup>. In the present study, we used minimal invasive technique for diagnosis and treatment of intussusception in 4 patients.

### Conclusion

Most patients in our series presented with chronic and sub acute symptoms with pain abdomen as the most common symptom. Contrast enhanced CT scan being the most sensitive investigation for preoperative diagnosis. Enteric intussusception should be reduced when the underlying etiology is suspected to be benign or the resection is massive without reduction. But not the colonic intussusception as etiology is malignant in most cases

**Conflict of interest:** None

### References

1. Haas EM, Etter EL, Ellis S, Taylor TV. Adult intussusception. *Am J Surg* 2003; 186:75–76

2. Barussaud M, Regenet N, Briennon X, et al. Clinical spectrum and surgical approach of adult intussusceptions: a multicentric study. *Int J Colorectal Dis* 2006; 21:834–839
3. Azar T, Berger DL. Adult intussusception. *Ann Surg* 1997; 226: 134-138
4. Begos DG, Sandor A, Modlin IM. The diagnosis and management of adult intussusception. *Am J Surg* 1997; 173: 88-94
5. Weilbaecher D, Bolin JA, Hearn D, Ogden W 2nd. Intussusception in adults. Review of 160 cases. *Am J Surg* 1971; 121: 531-535
6. Zubaidi A, Al-Saif F, Silverman R. Adult intussusception: a retrospective review. *Dis Colon Rectum* 2006; 49: 1546-1551
7. Tan KY, Tan SM, Tan AG, et al. Adult intussusception: experience in Singapore. *ANZ J Surg.* 2003; 73:1044–47
8. Wang LT, Wu CC, Yu JC, Hsiao CW, Hsu CC, Jao SW. Clinical entity and treatment strategies for adult intussusceptions: 20 years' experience. *Dis Colon Rectum* 2007; 50: 1941-1949
9. Eisen LK, Cunningham JD, Aufses AH Jr. Intussusception in adults: institutional review. *J Am Coll Surg* 1999; 188: 390-395
10. Hurwitz LM, Gertler SL. Colonoscopic diagnosis of ileocolic intussusception. *Gastrointest Endosc* 1986; 32: 217-218
11. Thomas AW, Mitre R, Brodmerkel GJ Jr. Sigmoidorectal intussusception from a sigmoid lipoma. *J Clin Gastroenterol* 1995; 21: 257
12. Wang N, Cui X Y, Liu Y, Long J, Xu Y H, Guo R X, Guo K J. Adult intussusception: A retrospective review of 41 cases. *World J Gastroenterol* 2009 July 14; 15(26): 3303-3308
13. Chang FY, Cheng JT, Lai KH. Colonoscopic diagnosis of ileocolic intussusception in an adult. A case report. *S Afr Med J* 1990; 77: 313-314
14. Fujii Y, Taniguchi N, Itoh K. Intussusception induced by villous tumor of the colon: sonographic findings. *J Clin Ultrasound* 2002; 30: 48-51
15. Boyle MJ, Arkell LJ, Williams JT. Ultrasonic diagnosis of adult intussusception. *Am J Gastroenterol* 1993; 88: 617-618
16. Weissberg DL, Scheible W, Leopold GR. Ultrasonographic appearance of adult intussusception. *Radiology* 1977; 124: 791-792
17. Goh BK, Quah HM, Chow PK, Tan KY, Tay KH, Eu KW, Ooi LL, Wong WK. Predictive factors of malignancy in adults with intussusception. *World J Surg* 2006; 30: 1300-1304
18. Gayer G, Zissin R, Apter S, Papa M, Hertz M. Pictorial review: adult intussusception-a CT diagnosis. *Br J Radiol* 2002; 75: 185-190
19. Chang C C, Chen YY, Chen Y F, Lin C N, Yen H H, Lou HY. Adult intussusception in Asians: Clinical presentations, diagnosis, and treatment *Journal of Gastroenterology and Hepatology* 22 (2007) 1767–1771
20. Marinis A, Yiallourou A, Samanides L , Dafnios N, Anastasopoulos G, Vassiliou I, Theodosopoulos T. Intussusception of the bowel in adults: A review *World J Gastroenterol* 2009 January 28; 15(4): 407-411
21. Reijnen HA, Joosten HJ, de Boer HH. Diagnosis and treatment of adult intussusception. *Am J Surg* 1989; 158:25–28
22. Karahasanoglu T, Memisoglu K, Korman U, Tunckale A, Curgunlu A, Karter Y. Adult intussusception due to inverted Meckel's diverticulum: laparoscopic approach. *Surg Laparosc Endosc Percutan Tech* 2003; 13: 39-41

23. Zaroni EC, Averbach M, Borges JL, Corrêa PA, Cutait R. Laparoscopic treatment of intestinal intussusception in the Peutz-Jeghers syndrome: case report and review of the literature. *Surg Laparosc Endosc Percutan Tech* 2003; 13: 280-282
24. Alonso V, Targarona EM, Bendahan GE, et al. Laparoscopic treatment for intussusception of the small intestine in the adult. *Surg Laparosc Endosc Percutan Tech* 2003; 13: 394-396
25. Jelenc F, Brencic E. Laparoscopically assisted resection of an ascending colon lipoma causing intermittent intussusception. *J Laparoendosc Adv Surg Tech* 2005; 15: 173-175.