

A Retrospective study of Intussusception of the bowel in adults

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Abstract

Introduction: Intussusception is the leading cause of intestinal obstruction in children. In contrast to childhood intussusception, adult intussusception accounts for only 5% of all intussusceptions with 90% having a lead point, a well-defined pathological abnormality. Adult intussusceptions pose a further challenge as they are often presented with acute, subacute or chronic non-specific symptoms. Computed tomography is the most sensitive diagnostic modality and can distinguish between intussusception with and without a lead point. Surgery is the definitive treatment of adult intussusceptions. So the aim was to evaluate adults with intussusception in and to assess its etiology, clinical features, diagnosis and management.

Methods: A retrospective review of adults aged >16 years with a diagnosis of intussusceptions between 1998- 2013 was done.

Results: There were 22 cases of adult intussusceptions. Mean age was 44 years (17-86 years). Abdominal pain, nausea, vomiting and rectal bleeding were the most common symptoms. There were 2 cases of retrograde jejuno gastric intussusception, 5 cases of jejunojejunal intussusceptions, 3 cases of ileoileal intussusceptions, 11 cases of ileocolic intussusceptions and 1 case of colocolic intussusception. In seventeen cases, the lead point for intussusception was identified out of which 13 cases had benign pathology and 4 cases had malignant pathology. In five cases cause was not found. All cases were treated surgically except one case of jejuno gastric intussusception which was reduced endoscopically. Mean duration of hospital stay was 13 days (5-30 days). Postoperative period was uneventful except surgical site infection in 8 cases and 1 case developed ECF which was managed conservatively. There was one mortality because of chest infection.

Conclusion: Adult intussusception is an unusual and challenging condition having a well-defined pathological abnormality in most of the cases. Treatment usually requires resection of the involved bowel segment.

Keywords: Adult Intussusception, Computed tomography, Surgery

Introduction

Intussusception is defined as the invagination of one segment of the gastrointestinal tract and its mesentery (intussusceptum) into the lumen of an adjacent distal segment of the gastrointestinal tract (intussusciens). Adult intussusception is a rare condition which can occur in any site of gastrointestinal tract from stomach to rectum. Adult intussusceptions pose a further challenge as they are often presented with acute, subacute, or chronic non-

specific symptoms. The spectrum of clinical presentation depends on the site of the intussusception, the timing of clinical presentation, and the predilection for spontaneous reduction. Treatment is almost always surgical in adults when compared to children and invariably leads to resection of the involved bowel segment with subsequent primary anastomosis.

Therefore in this paper, we report our experience in this uncommon entity in relation to its cause, clinical features, diagnosis, and management.

Methods

The clinical, operative, and pathological records of 22 adult patients (> 16 years of age) with a diagnosis of intussusception, surgically treated in year 1998-2013 were reviewed retrospectively. Patients with rectal prolapse, prolapse of or around an ostomy were excluded.

Results

A total of 22 patients were identified who had a diagnosis of intussusception and were older than 16 years of age. The average age of the patients was 44 (± 20) years, with a range of 17 to 86 years. Males and females were equal in number.

Pain was the most common presenting complaint and was present in all patients. Nausea, vomiting, constipation, rectal bleeding, and diarrhea were other symptoms. A palpable mass was found in seven patients (31.8%). Thirteen cases presented with symptoms and signs of intestinal obstruction (as shown in Table 1). The mean duration of symptoms was 14.3 d (range, 1 day to 3 months). Five patients (22.7%) had acute symptoms (< 4 d), 5 (22%) had subacute symptoms (4-14 d), and 12 (54.5%) had chronic symptoms (> 14 d).

Table 1 Clinical manifestation of the patients

Presentations	No. (%)
Pain	22(100%)
Vomiting	16(72.7%)
Bowel obstruction	13(59.1%)
Rectal bleeding	10(45.5%)
Abdominal lump	7(31.8%)
Loose stool	5(22.7%)
Haematemesis	1(4.5%)

Diagnostic procedure

Intussusception was a preoperative diagnosis in 14 patients (63.6%). Thirteen patients had features of intestinal obstruction confirmed by plain X-Ray Abdomen. One was diagnosed by barium enema. Upper GI Endoscopy revealed retrograde jejuno gastric intussusception in two cases. USG Abdomen diagnosed intussusception in 6 cases. Abdominal computed tomography scan was performed in 8 patients and

all of them were suggestive of intussusceptions (as shown in Table 2). The finding on CT was an in-homogeneous soft-tissue mass that was target-or sausage-shaped.

Table 2 Finding in the diagnostic procedure

Investigations	No. (%)	Diagnostic
Plain X-Ray Abdomen	13(59.1%)	0
Barium Enema	1(4.5%)	1
USG Abdomen	20(90.1%)	6
Colonoscopy	2(9.1%)	2
CECT Abdomen	8(36.4%)	8
UGI Endoscopy	2(9.1%)	2

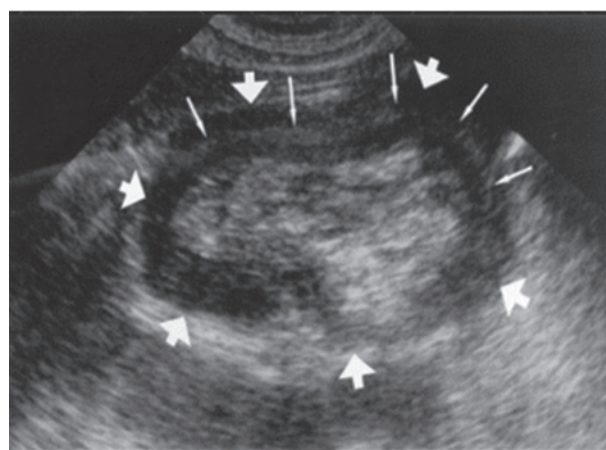


Figure 1 USG showing Ileocolic Intussusception

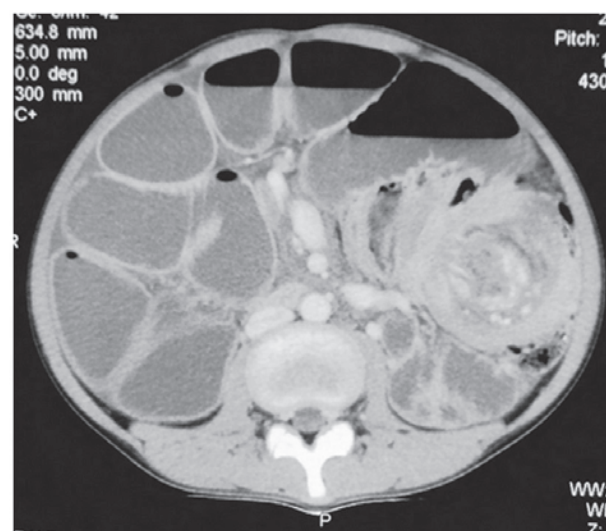


Figure 2 CECT showing Ileocolocolic intussusception

Location of the intussusception

The majority of intussusceptions were ileocolic covering 11 cases followed by 5 cases of jejunojejunal intussusceptions, 3 cases of ileoileal intussusceptions, and 1 case of colocolic intussusception. There were 2 cases of jejunogastric intussusceptions.

Pathological finding

In seventeen cases, the lead point for intussusception was identified out of which 13 cases had benign pathology and 4 cases had malignant pathology. In five cases, cause was not found. The benign causes for enteroenteric intussusceptions were meckel's diverticulum, Peutz-jegher's polyp, inflammatory bowel disease, foreign body granuloma at feeding jejunostomy site whereas the others two were caused by poorly differentiated adenocarcinoma and gastrointestinal stromal tumor. Similarly six of the ileocolic intussusceptions were caused by benign processes like submucous lipoma, benign ulcers, inflammatory fibroid polyp of appendix, ileocaecal TB and inflammatory myofibroblastic tumor with two caused by gastrointestinal stromal tumor and leiomyoblastoma. There was one colocolic intussusception which was due to inflammatory polyp. Two retrograde jejunogastric intussusceptions occurred in previous gastrojejunostomy site.

Table 3 Finding on Gross and Histopathological examination (HPE)

Benign Pathology	N=17	Malignant Pathology	N=4
Retrograde jejunogastric intussusception	2		
Postoperative	2		
<u>Enteroenteric intussusception</u>	6	<u>Enteroenteric intussusception</u>	2
Meckel's diverticulum	1	Poorly differentiated adenocarcinoma	1
Peutz-jegher's polyp	1	Gastrointestinal stromal tumor	1
Inflammatory bowel disease	1		
Foreign body granuloma at feeding jejunostomy site	1		
Idiopathic	2		
<u>Ileocolic intussusception</u>	9	<u>Ileocolic intussusception</u>	2
Submucous lipoma	2	Gastrointestinal stromal tumor	1
Benign ulcers	1	Leiomyoblastoma	1
Inflammatory fibroid polyp of appendix	1		
Ileocaecal TB	1		
Inflammatory myofibroblastic tumor	1		
Idiopathic	3		
<u>Colocolic intussusception</u>	1		
Inflammatory Polyp	1		

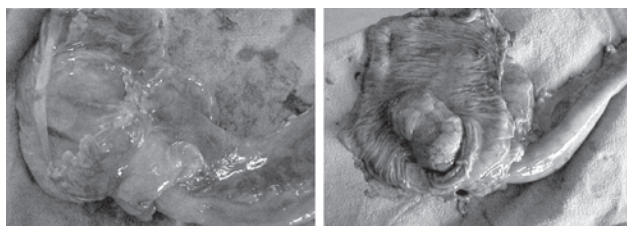


Figure 3. Specimens showing Ileocolic Intussusception

Treatment and complications

Surgery was the treatment of choice in all of the cases except one case of jejunogastric intussusception which was reduced endoscopically. Other jejunogastric intussusception was treated by surgical reduction. In most of the cases, no attempt of reduction was made preoperatively unless benign etiology was confirmed or massive length of bowel was involved. Eight patients underwent resection and anastomosis of the small bowel segment; eleven ileocolic intussusception had right standard hemicolectomy and one colocolic intussusception underwent right extended hemicolectomy.

Mean duration of hospital stay was 13 days (5-30 days). Eight cases had surgical site infection and one developed enterocutaneous fistula which was managed conservatively. One elderly male with multiple comorbidities succumbed to death due to chest infection.

Discussion

Adult intussusception is a rare condition which can occur in any site of gastrointestinal tract from stomach to rectum. It represents only about 5% of all intussusceptions and causes 1-5% of all cases of intestinal obstructions.^{1,3,4} The exact mechanism is unknown, and it is believed that any lesion in the bowel wall or irritant within the lumen that alters normal peristaltic activity has ability to initiate the process of intussusception.^{2,5} Ingested food and the subsequent peristaltic activity of the bowel produce an area of constriction above the stimulus and relaxation below, thus invaginating the lead point (intussusceptum) through the distal bowel lumen (intussusciens).^{1,2} The most common locations in GI tract are at the junctions between freely moving segments and retroperitoneally or adhesioneally fixed segments.^{5,6} Intussusception in adults has an identifiable etiology in 80- 90% of cases. The etiology of intussusception in different parts of GI tract is quite different. 50-75% of adult small bowel intussusception are because of benign pathology.^{2,8,9} The most common lesions are adhesions and Meckel's diverticulum followed by lymphoid hyperplasia, lipomas, leiomyomas and hemangiomas. Intussusceptions are more likely to occur in

the small intestine than in the colon without obvious cause. Malignant causes of small bowel intussusception include primary leiomyosarcomas, malignant gastrointestinal stromal tumors, carcinoid tumors, neuroendocrine tumors and lymphomas. Similarly, majority of cases in our study were benign.

The symptoms in cases of adult intussusception are so non-specific that a clinical diagnosis without acute bowel obstruction is rarely made before surgery. The spectrum of clinical presentation depends on the site of the intussusception, the timing of clinical presentation, and the predilection for spontaneous reduction. Most patients manifest subacute (about 24%) or chronic (about 50-73%) symptoms.^{8,18} In most cases of ours, symptoms were nonspecific except five presented acutely and seven had abdominal mass.

Several imaging techniques may give the idea about the causative lesion preoperatively. Plain abdominal X-rays are the first diagnostic tool which show signs of intestinal obstruction, and provide information regarding the site of obstruction.⁸ Contrast studies can help to identify the site and cause of the intussusception, particularly in more chronic cases but should be avoided in case of bowel perforation. In our series, plain X-Ray abdomen was useful in acute cases where they presented with bowel obstruction.

Colonoscopy is also a useful tool for evaluating intussusception, especially when the presenting symptoms indicate a large bowel obstruction.^{2,12} Polypectomy or biopsy is not advisable due to high risk of perforation as result of chronic tissue ischemia.¹²

Ultrasonography has its own role in identifying intussusception. The classic features include the "target and doughnut sign" on transverse view and the "pseudokidney sign" in longitudinal view.¹³ USG abdomen pointed out intussusception in four of our cases. Main drawbacks of USG abdomen are that it is operator dependent and vision is obscured by gas filled loops.

Intussusception is well diagnosed on multi-slice spiral computed tomography with a diagnostic accuracy near 100%.¹⁴ Abdominal CT is the most useful diagnostic tool not only for detecting an intussusception, but also helps in identifying the underlying cause.^{15,16,17} The CT appearance of an intussusception is often a complex target-shaped or sausage-shaped in-homogeneous soft tissue mass with an eccentric area of fat density contained within, which represents the mesenteric fat. USG abdomen was diagnostic in only six of the cases whereas CECT abdomen was diagnostic in all when it was done.

Laparoscopy, although not an imaging study, is obviously an excellent evaluation tool when intussusception is suspected in a patient with bowel obstruction. It allows for identification of the location, the nature of the lead point, and the presence of compromised bowel.¹⁸

The sensitivities of the different radiological methods are abdominal ultrasounds (35%), upper gastrointestinal barium study (33%), abdominal computed tomography (58-100%), barium enema (73%), and colonoscopy (66%).^{18,22}

Treatment is almost always surgical in adults when compared to children and invariably leads to resection of the involved bowel segment with subsequent primary anastomosis. The choice of using a laparoscopic 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. Emergency operations are necessary in about 35–60% of all adult patients with intussusception. For all patients who present with signs of perforation, shock, or peritonitis, immediate laparotomy is necessary.

Most of the debate focuses on the issue of primary en bloc resection versus initial reduction, followed by a more limited resection.^{1,2,18} Proponents of primary resection cite the high incidence of underlying malignancy, especially in colonic lesions, which mandates en bloc resection. The reduction of an intussusception secondary to a malignant lead point is potentially detrimental, as there is the theoretic risk of intraluminal seeding and venous embolization in regions of ulcerated mucosa. Other drawbacks include the increased risk of anastomotic complications (the bowel wall may be weakened during manipulation) and the potential for bowel perforation.^{19,20} The main problem is to distinguish the benign and the malignant lesions preoperatively.²¹ Enteric intussusceptions due to benign lesions in patients with a risk of a short bowel syndrome can be approached with limited intestinal resections after reduction.^{22,23} Except cases of reduction of jejuno gastric intussusception, all our patients underwent en bloc resection and anastomosis without reduction of the intussusception unless benign etiology was confirmed or massive length of bowel was involved.

Recently, minimally invasive techniques such as endoscopic procedure, laparoscopic small and large bowel resections, have been applied to the treatment of small or large bowel obstruction and intussusception.^{24,25,26}

Jejunogastric intussusception is a rare complication of gastrojejunostomy which can occur any time after the gastric operation. Early diagnosis of this condition and prompt surgical intervention is mandatory: a mortality of 10%

and even as high as of 50% has been reported if operation has been performed 48 h or later after the onset of severe symptoms, respectively.²⁷⁻²⁹ UGI endoscopy is diagnostic and surgical options include reduction, resection, revision of the anastomosis and the take-down of the anastomosis, depending on the conditions found during the operation.²⁷⁻²⁹ One of our patients underwent endoscopic reduction while the other underwent surgical reduction.

Conflicting Interest: None declared

Conclusion

Adult intussusception is an unusual and challenging condition having a well-defined pathological abnormality in most of the cases. Treatment usually requires resection of the involved bowel segment.

References

1. Azar T, Berger DL. Adult intussusception. *Ann Surg* 1997;226: 134-138
2. Begos DG, Sandor A, Modlin IM. The diagnosis and management of adult intussusception. *Am J Surg* 1997; 173: 88-94
3. Weilbaecher D, Bolin JA, Hearn D, Ogden W 2nd. Intussusception in adults. Review of 160 cases. *Am J Surg* 1971; 121: 531-535
4. Marinis A, Yiallourou A, Samanides L. Intussusception of the bowel in adults: A review. *World J Gastroenterol*. 2009; 15: 407-411
5. 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
6. Sachs M, Encke A. Entero-enteral invagination of the small intestine in adults. A rare cause of "uncertain abdomen". *Langenbecks Arch Chir* 1993; 378: 288-291
7. Felix EL, Cohen MH, Bernstein AD, Schwartz JH. Adult intussusception; case report of recurrent intussusception and review of the literature. *Am J Surg* 1976; 131: 758-761
8. Tan KY, Tan SM, Tan AG, Chen CY, Chng HC, Hoe MN. Adult intussusception: experience in Singapore. *ANZ J Surg* 2003; 73: 1044-1047
9. Sarma D, Prabhu R, Rodrigues G. Adult intussusception: a six-year experience at a single center. *Annals of Gastroenterology* 2012; 25: 128-133

10. Ma KW, Li WH, Cheung MT. Adult intussusception: A 15 year retrospective review. *Surgical Practice* 2012; 16: 6-11
11. Eisen LK, Cunningham JD, Aufses AH Jr. Intussusception in adults: institutional review. *J Am Coll Surg* 1999; 188
12. Hurwitz LM, Gertler SL. Colonoscopic diagnosis of ileocolic intussusception. *Gastrointest Endosc* 1986; 32: 217-218
13. Cerro P, Magrini L, Porcari P, De Angelis O. Sonographic diagnosis of intussusceptions in adults. *Abdom Imaging* 2000; 25: 45-47
14. Bar-Ziv J, Solomon A. Computed tomography in adult intussusception. *Gastrointest Radiol* 1991; 16: 264-266
15. Gayer G, Apter S, Hofmann C et al. Intussusception in adults: CT diagnosis. *Clin Radiol* 1998; 53: 53-57
16. Warshauer DM, Lee JK. Adult intussusception detected at CT or MR imaging: clinical-imaging correlation. *Radiology* 1999; 212: 853-860
17. Takeuchi K, Tsuzuki Y, Ando T et al. The diagnosis and treatment of adult intussusception. *J Clin Gastroenterol* 2003; 36: 18-21
18. 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
19. Chang CC, Chen YY, Chen YF, Lin CN, Yen HH, Lou HY. Adult intussusception in Asians: clinical presentations, diagnosis, and treatment. *J Gastroenterol Hepatol* 2007; 22: 1767-1771
20. Yamada H, Morita T, Fujita M, Miyasaka Y, Senmaru N, Oshikiri T. Adult intussusception due to enteric neoplasms. *Dig Dis Sci* 2007; 52: 764-766
21. Nagorney DM, Sarr MG & McIlrath DC. (1981). Surgical management of intussusception in the adult. *Ann Surg*. 1981;193: 230-236
22. Erkan N, Hacıyanlı M, Yıldırım M, Sayhan H, Vardar E & Polat AF. (2005). Intussusception in adults: an unusual and challenging condition for surgeons. *Int J Colorectal Dis*. 2005; 20: 452-456
23. Franz B, Rabl C, Neureiter D, Ofner D & Emmanuel K. (2010). Emergency surgery for enteric and colonic intussusception in adults. *Eur Surg*. 2010; 42: 180-183.
24. 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
25. Zandoni 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
26. Palanivelu C, Rangarajan M, Senthilkumar R, Madankumar MV. Minimal access surgery for adult intussusception with subacute intestinal obstruction: a single center's decade-long experience. *Surg Laparosc Endosc Percutan Tech*. 2007; 17:487-491
27. Shackman R: Jejunogastric intussusception. *Br J Surg* 1940, 27:475-480
28. Sibley WL: Chronic intermittent intussusception through the stoma of a previous gastro-enterostomy. *Proc Staff Meet Mayo Clin* 1934, 9:364-365
29. Archimandritis AJ, Hatzopoulos N, Hatzinikolaou P et al. Jejunogastric intussusception presented with hematemesis: a case presentation and review of the literature. *BMC Gastroenterology* 2001; 1:1