Jejuno-jejunal intussusception in an adult - a cadaveric case report

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Abstract

Intussusception is rare in adults. It accounts for 5 to 10% of all intussusceptions and 1% of all bowel obstructions. It has a definite lead point in the form of either a lesion in the bowel wall or intraluminal, which alters the normal peristalsis and may lead to an invagination. It may present as an acute, intermittent or chronic problem and thus making its pre-operative diagnosis difficult. The symptoms are usually those of bowel obstructions which include nausea, vomiting, abdominal pain with or without melena and it depends on the causative lesions. Ultrasound and CT scans are the two most important radiological methods used in the diagnosis of intussusceptions. Surgical resection of the intussuscepted mass without reduction and end to end anastomosis is the preferred line of treatment in adults, because most of the enteric intussusceptions are associated with malignancy. In this report, we present a case of jejuno-jejunal intussusception in a dissection hall cadaver and analyze its incidence, etio-pathogenesis, classification, symptomatology, importance of imaging studies in the diagnosis and the therapeutic interventions in detail.

Key words: jejunum, CT scan, resection, bowel obstruction

Introduction

Intussusception of the bowel, first reported in 1674, is defined as a clinical condition in which a proximal bowel segment along with its mesenteric fold (intussusceptum) telescopes into the lumen of the adjacent distal bowel segment (intussuscipiens). Intussusception in adults is a rare entity, represent 1% of all intestinal obstructions and involve mostly the ileocaecal region. But it commonly encountered in children aged between 6 months to 4 years.

In children there is usually no lead point, and the cause is thought to be either idiopathic or in the form of a viral infection that results in either enlarged ileocolic lymph nodes or bowel wall inflammation. A lead point is usually found in adult intussusceptions which account for 5-10% of all cases of intussusceptions. Any lesions both in the bowel wall or intraluminal may usually alter the normal peristalsis and form the leading edges for the intussusceptions. In children the intussusceptions present with an acute history, but in adults it may present as acute, intermittent or chronic problems and thus making its pre-operative diagnosis difficult. In adults, intussusceptions may be classified into enteric, colonic, ileocolic and ileocaecal and there is no anatomical predilection for a particular type. The predominant symptoms of adult intussusceptions are usually those of bowel obstruction, includes nausea, vomiting, abdominal pain with or without melena, depending on the causative reasons. Intussusception is often misdiagnosed initially in the adult population. Computerized tomographic scanning is proved to be the most useful radiological tool in the diagnosis of intussusceptions. Surgical resection of the intussusceptions without reduction is the preferred treatment in adults, as almost half of the enteric intussusceptions are associated with malignancy. We present a case of jejuno-jejunal intussusception in a male cadaver, aged approximately between 60 and 65 years.

Case report

While performing the routine abdominal dissection in the Department of Anatomy, we came across a moderately built, emaciated male cadaver, aged approximately between 60-65 years, voluntarily donated from a nearby old age home. The cadaver was obtained
after following all the routine norms of the institution and the region. On opening the abdomen, the small bowel (jejunum) was found to be dilated and appeared as a solid mass (Fig. 1a). On close examination, it was found to be a jejuno-jejunal intussusception of about 7.5 x 4.5 cms in size, located 43 cms distal to the duodeno-jejunal flexure. An initial trial reduction by milking the telescopic segment was attempted, but was failed. So an incision was done close to the mesenteric border of the jejunum and the telescopic segment of the small bowel was released. The length and diameter of the invaginated part of the jejunum after reduction (intussusceptum) was 10.5 x 1.5 cms (Fig. 1b). Later the entire jejunal loop was opened and washed in running water and the interior was examined for any tumor or polyps or any other macro pathologial lesions (Fig.2). A bit of the jejunal tissue from the invaginated portion (intussusceptum) was sent for histo-pathological examination, which revealed the features of ischemic necrosis of the superficial portion of the mucosa with inflammatory changes which is consistent with the findings seen in the cases of intussuscepted jejunum (Fig.3).

Discussion

Intussusception in adults is less common and constitutes 1% of all bowel obstructions. It accounts for about 5-10% of all cases of intussusceptions and 0.003% to 0.02% of all hospital admissions. Intussusception in adults completely differs from that of children. The clinical picture in adults is subtle and the diagnosis is therefore elusive. In children it presents as an acute episode, but in adults it presents with variety of symptoms, in the form of acute, intermittent and chronic episodes. These symptoms are persistent with that of typical bowel obstructions, so the preoperative diagnosis of intussusception is difficult to make in the adult population. In children, the lead factor is mostly idiopathic in more than 90% of the patients, but in adults the majority of the cases over 70 - 90% were with definite lead factors.

Neoplasms were the most frequent causes of adult intussusceptions. Almost 90% of all small bowel intussusceptions were due to benign tumors in the form of lipoma, polyps, adenoma, gastrointestinal stromal tumor, hamartoma, leiomyoma, neurofibroma, and Peutz-Jeghers syndrome. Conditions like, post-operative adhesions, suture lines, intestinal tubes, submucosal oedema, intestinal dysmotility, chronic dilatation of bowel, inflammatory diseases such as salmonellosis, crohn's disease, tuberculosis and HIV-AIDS also cause intussusceptions in less number of cases in adults. The miscellaneous causes like Meckel's diverticulum, coeliac sprue, intramural haematoma, human immunedeficiency virus and duplication of intestines are also said to cause the small bowel intussusceptions. In less than 10% of the cases, the causative etiology belongs to metastatic tumors like malignant melanoma, malignant gastro intestinal stromal tumor, osteosarcoma, lymphoma and metastasis from various primary sites like lungs, breast, cervix and kidney. Idiopathic etiology accounts only for few number of cases of adult intussusceptions.

The mechanism of the formation of intussusception is due to any lesion in the bowel wall or an irritant within the lumen which alters the normal peristalsis and are able to initiate invagination. If the local region does not contract normally, the unbalanced peristaltic forces may rotate the intestinal wall inwards and initiate the invagination. It occurs more commonly at the junctions between the freely moving segments as well as retroperitoneal regions or post-operative adhesion segments. In the cases of malabsorption syndromes, the bowel loops become dilated and flaccid with increased secretions and disturb the normal peristalsis which results in intussusception. Reymond postulated two mechanisms for the development of intussusceptions. In the first instance, a functionally non-contracile, non-homogenous part of the bowel wall, become an indurated area or a flaccid motile interface to initiate invagination.

In the second instance, there is a mechanical linkage of two non - adjacent bowel segments with an intraluminal
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... (polyp) or extra luminal (post - operative) adhesion, may act as a lead point.

Based on the site of occurrence, the intussusceptions were classified into four groups, namely enteric, colonic, ileocolic and ileocecal. The enteric group includes cases involving jejunum and ileum while colonic group involves the large intestine alone. In the ileocolic group, the ileum is prolapsed into colon through ileocecal orifice and in ileocecal group with ileocecal valve acts as the lead point for intussusceptions. It is difficult to differentiate between ileocolic and ileocecal group. The patients were further divided into benign or malignant groups based on the etiological pathological reports. Most cases of adult intussusception involve ileocecal area but enterocolonic intussusception accounts for 40% of the cases.

Adult intussusceptions differ from that of children with regard to the clinical presentations. The classical clinical triad of conventional intussusceptions seen in children viz, sudden onset of intermittent colicky pain, blood stained mucous (red currant jelly) stools and a palpable sausage shaped mass was uncommon in adults. The acute presentation was rare, but many have subacute or chronic onset of symptoms of bowel obstructions. The clinical findings were variable with episodes of intermittent vague abdominal pain, nausea, vomiting, abdominal distension with partial obstruction and a palpable mass on physical examination. Melena or stools positive for occult blood, even though frequently associated with children were seen in less number of cases. Fever, weight loss, constipation and diarrhoea were also occurring in few numbers of cases. Symptoms were further classified according to etiology. Patients with benign enteric lesions had nausea, vomiting, and abdominal pain with the greatest frequency. Patients with malignant colonic lesions had melena or stool positive for occult blood more often than with nausea, vomiting and / or abdominal pain. The symptoms were longer in duration in the benign compared with that of malignant lesions and were also longer in the enteric as compared with that of colonic lesions. Therefore it is difficult to diagnose intussusceptions in adults. The majority of patients were brought to the operating room with a pre - operative diagnosis of small bowel obstruction and the surgeon confirms intussusceptions only intraoperatively.

Different imaging processes were used in the diagnosis of intussusceptions. Plain x-rays of the abdomen were non-specific and demonstrate the presence of multiple air / fluid levels, which suggests a mechanical obstruction. Intraluminal air was sometimes trapped between the walls of the intussusceptum and intussuscepters and appears as 'air crescent sign' in plain abdominal radiograph, but this findings lack sensitivity to confirm intussusception. Barium meal may confirm the intussusception with a specific finding of 'coiled spring' or 'stacked coin' appearance, while 'stretchedpring sign' indicates a vascular compromise. Barium enemas are quite accurate in diagnosing the colonic intussusceptions with a "cup-shaped defect". Barium studies are useful in children and are the second most accurate method in the diagnosis after CT scan. Barium examinations were restricted only to the routine checkup of the patients and should not be employed in acute conditions due to the risk of bowel rupture and barium peritonitis. Ultrasound is by far the common diagnostic modality employed by majority of surgeons to evaluate the intestinal obstructions both in adults as well as in children in emergencies. Intussusception can be diagnosed based on the findings of the "target-like" or the "doughnut" sign, when the transducer is oriented transversely to the intussusception, the "trident" sign when the transducer is positioned longitudinally and the "pseudo kidney" sign when oriented obliquely. It has its distinct advantage of being fast and real time examination and with color Doppler analysis, it can be useful to determine any vascular obstruction. The presence of distended bowel loops diminishes the ability to demonstrate the exact site of obstruction and only the experienced sonologists pinpoint these obstructions.

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The abdominal CT scan proved to be the most useful imaging method for diagnosing intussusception. It appears as "target mass" on CT just like ultrasound. The intussusceptors is edematous and forms the external ring and the intussusceptum forms the centre of the target mass. Early intussusceptions appear as target masses associated with obstruction. Later the bowel thickens, more layering of bowel occurs. Ultimately bowel undergoes necrosis and appears as an amorphous mass associated with obstruction. Manouras et al.11 and Gayer et al.12 also described CT scan appearances of the intussusceptions either in the form of a mass lesion which represents a bowel thickening or a crescent-like, eccentric low density fat mass, reveals an entangled mesenteric fat or a rim of contrast medium surrounds the intussusceptum and represents coating of the opposing bowel walls or in the form of air bubbles peripheral to the upper part of the intussusceptions or a leading mass. CT scan also gives the details about the bowel wall ischemia, presence of intraperitoneal fluid and the status of fluid or gas collected in the intestinal wall. The sensitivity of the CT scan in the diagnosis of adult intussusceptions was about 100% which was verified by subsequent surgery and the negative finding does not exclude intussusceptions.11

Capsule endoscopy, a newer diagnostic technique is also used to diagnose intussusceptions and it depends on the nature of symptoms. It is contraindicated in patients with obstructive lesions. It is helpful for the evaluation of the small bowel in cases with long standing abdominal pain and negative radiological examination, to exclude malignancy. Intussusception in small bowel appears as a mass lesion in capsule endoscopy. It is also used to identify the structural lead point in cases with incidentally discovered intussusception. Recently enteroscopy with push enterroscope was used to examine about 70-150 cms of the small bowel and double balloon enteroscopy was used to examine the full length of the small bowel both antegrade and retrograde. Enteroscopy techniques are advantageous over capsule endoscopy in that, the biopsy and endoscopic polypectomy are possible in these techniques. Angiography and radionucleotide studies have shown little efficacy in the diagnosis of intussusceptions and were probably less used.3, 5, 11

Intussusception is a rare differential diagnosis in adult patients with vague abdominal complaints. Diagnosis of this condition is possible only with the presenting complaints as well as the utilization of imaging techniques, especially CT scans. Diagnostic laparoscopy and / or exploratory laparotomy can also be used as a diagnostic and therapeutic intervention. The clinical importance of the intussusceptions in adults lies in its underlying pathology. So the treatment plan should be individualized according to the age of the patient, the anatomical location and the causative factors of the intussusceptions. Since the adult intussusceptions has a definite etiology in the form of a well defined pathological abnormality in over 90% of the cases, in which about 30% are malignant, an "en bloc" segmental resection with the goal of achieving negative resection margins and with primary restoration of the continuity of the gastrointestinal tract is the treatment of choice.12 But some surgeons advocate an initial trial reduction by milking out the intussuscepted segment, because over 90% of the small bowel intussusceptions are always associated with benign cause. However, the extent of the segmental resection as well as attempt of trial reduction or not should always remain controversial.13, 5, 11, 14. There are dangers of transperitoneal, vascular and intraluminal spread of malignant cells occur, if the friable and edematous malignant mass has been inadvertently exposed and handled. Also there may be venous embolization in regions of ulcerated mucosa, and anastomotic complications, which may potentially lead to bowel perforation. But it is an accepted fact that the "en bloc" resection may lead to an unnecessary and extensive bowel loss. Also the reduction of the intussuscepted bowel should not be attempted if there are signs of irreversible bowel
ischemia, inflammation and suspected malignancies. There are exceptions to "en bloc" resection in duodenal and rectal intussusceptions because reduction could result in the preservation of the duodenum and the avoidance of abdomino-perineal resection respectively. Manouras et al. believed that the reduction could be tried safely in cases where the diagnosis of benign lesion was confirmed pre-operatively. But Azar et al. insisted of surgical intervention in all cases of adult intussusception. The type of surgical intervention was determined based on the patients' medical history and intra-operative findings. Resection of all intussusceptions in adults without intra-operative reduction has been accepted by majority of surgeons. Recently there are several case reports suggest about using laparoscopy as a minimally invasive technique for both diagnosis and treatment of adult intussusceptions. So we advocate an "en bloc" resection of the lesion with lymph node clearance and end to end anastomosis for all cases of intussusceptions with malignancies. In cases with benign etiology, exploratory laparotomy with trial reduction with or without resection is generally advised. The causative reason for intussusception in our case cannot be ascertained because our case was a dissection hall specimen and we do not have the ante-mortem history and cause of death of the patient.
Conclusions

Intussusception is the invagination of a bowel segment into an adjacent segment of the gastrointestinal tract. It can occur anywhere in the gastrointestinal tract. Any lesion either in the wall or in the lumen may alter the normal peristalsis and causes an invagination. It occurs rarely in adults and always associated with an underlying cause in 90% of the patients. It has a variety of clinical presentations with different symptoms and with varying duration of symptoms. Thus, the diagnosis of intussusception is difficult to make before surgery. CT scan is the most useful imaging modality in the diagnosis. Even though majority of the cases were with benign lead factors, intussusceptions can also harbor malignant lesions. So surgeons should think of intussusceptions as a cause of intestinal obstruction and should be familiar with various treatment options. Resection without reduction is advocated as the best treatment of adult intussusception.

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