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focus on

Adult bowel intussusception: presentation, location, etiology, diagnosis and treatment

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SUMMARY: **Adult bowel intussusception: presentation, location, etiology, diagnosis and treatment.**

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Bowel intussusception is rare in adults but common in children. Almost 90% of adult intussusceptions are secondary to a pathologic condition and the clinical picture can be very aspecific and challenging. In this review we discuss the symptoms, location, etiology, characteristics, diagnostic methods and treatment strategies of this rare and enigmatic clinical entity in adults.

We have to highlight the high index of suspicion that is necessary for the operating surgeon, when dealing with acute, subacute or chronic abdominal pain in adults, because any misinterpretation may result in unfavorable outcomes.

KEY WORDS: Adult Intussusception - Clinical Presentation - Diagnosis - Treatment.

Introduction

Intussusception in adults is a rare clinical entity and is found in less than 1 in 1300 abdominal operations. Interestingly, the child to adult ratio is reported more than 20:1 (1). This clinical entity was first described in 1674 by Barbette of Amsterdam and presented in 1789 by John Hunter as "introssusception", a rare form of bowel obstruction in the adult (2). The surgeon will not often encounter this clinical entity in his career. It is reported in literature that the first to operate on a child with intussusception was Sir Jonathan Hutchinson in 1871 (3, 4).

Intussusception is defined as prolapse of a proximal bowel segment into a distal segment. It is rare in adults but common in children. Therefore, intussusceptions in children are idiopathic in 90% of cases and can safely be reduced. In adults, only 1–5% of bowel obstructions are caused by intussusception. A causal lesion is identified in 90% of these cases (5, 6). This condition is believed that accounts for less than 0.1% of all adult hospital admissions (7). Most patients present as an emergency with a clinical picture of intestinal obstruction. In non emergency patients the diagnosis can be very challenging. Symptoms in these cases are aspecific and include intermittent abdominal pain (8).

Moreover, adult intussusception is distinct from pediatric in various aspects. In children, it is usually primary and benign, and pneumatic or hydrostatic reduction is the sufficient treatment in 80% of patients (9). On the other hand, almost 90% of adults intussusceptions are secondary to a pathologic condition that serves as a lead point. Interestingly, carcinomas, polyps, Meckel's diverticulum, colonic diverticulum and benign neoplasms are frequently the leading points, which are usually discovered intraoperatively. In addition, all the researchers report that, due to a significant risk of associated malignancy, radiologic decompression is not recommended preoperatively in adults (10). On the other hand, the clinical picture of pediatric intussusception often is acute with sudden onset of intermittent colicky pain, vomiting, and bloody mucoid stools, and the presence of a palpable mass, while in adults it may present with acute, subacute, or chronic non-specific symptoms (11). Therefore, the initial diagnosis is often missed or delayed and may only be established at the operating theater. In addition, most surgeons agree that adult intussusception requires surgical resection because the majority of patients have intraluminal lesions. However, the extent of resection and whether the intussusception in adults should be reduced remains controversial (12). Computed

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tomography (CT scan) is the most sensitive diagnostic method and can often distinguish between intussusceptions with or without a lead point. All the researchers report that surgery is the definitive treatment of adult intussusceptions (13).

Clinical presentation

It is reported that common physical findings include abdominal distension and tenderness. Interestingly, an abdominal mass associated with colicky pain, nausea, vomiting, change in bowel habits, constipation, hypoactive to absent bowel sounds, and bleeding are often present. The classic triad of intussusception including an abdominal mass, tenderness, and haemoglobin-positive stools is rarely found in adults. Blood loss or a palpable mass are present in a minority of cases. Symptoms can be acute, intermittent or chronic (14). The presenting symptoms in adult patients with intussusception are non-specific and often long standing. Most series report pain as the commonest symptom with vomiting and bleeding from the rectum as the next most common symptoms.

The most important characteristic of pain is its periodic, intermittent nature, which makes the diagnosis elusive. In other words, only half the cases are diagnosed before operation. Abdominal mass is noted in 24% to 42% of cases. In addition, intussusception in adults can be classified according to the presence of a lead point or not. Interestingly, 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 type of intervention. On the other hand, intussusception with an organic lesion as the lead point usually presents with the clinical picture of bowel obstruction (15, 16). The clinical presentation in adult intussusceptions is often chronic, and most patients present with non-specific symptoms that are suggestive of intestinal obstruction. The symptoms in cases of adult intussusception are so non-specific that a clinical diagnosis beyond bowel obstruction is rarely made before surgery. Rarely, this clinical entity may present in adults with the clinical picture of acute intestinal obstruction (17).

Location and etiology

About 90% of the intussusceptions in adults occur in the small or large bowel, while the remaining 10% involve the stomach or a surgically made stoma. Usually the most common site is the small bowel. Interestingly, coloanal intussusceptions are rare and occur in the setting of a benign or malignant tumour, with 50% attributable to a malignant lesion. In addition, gastroduodenal intussusception, the least frequent of all intussusceptions , is caused by the prolapse of a benign gastric tumour into the duodenum, with subsequent invagination of a portion of the stomach wall. Interestingly, intussusceptions have been classified according to their locations into four categories: (1) entero-enteric (confined to the small bowel), (2) colo-colic (involving the large bowel), (3) ileo-colic (prolapse of the terminal ileum within the ascending colon) and (4) ileo-cecal, (the ileo-cecal valve is the leading point of the intussusception) (18, 19). Moreover, intussusceptions have also been classified according to their etiology in benign, malignant or idiopathic. Is believed that in the small bowel, an intussusception can be secondary either to the presence of intra- or extra-luminal lesions such as inflammatory lesions, Meckel's diverticulum, postoperative adhesions, lipoma, adenomatous polyps, lymphoma and metastases. Malignant lesions are responsible for up to 30% of cases of intussusception occurring in the small bowel. On the other hand, intussusception occurring in the large bowel is more likely to have a malignant etiology for up to 66% of the cases (20).

Although the exact mechanism leading to intussusception is unknown, it is believed that any lesion in the bowel wall or irritant within the lumen that alters normal peristaltic bowel activity is able to initiate the invagination process. Ingested food and the subsequent peristaltic activity of the bowel has as result an area of constriction above the stimulus and relaxation below, thus telescoping the lead point through the distal bowel lumen. The most common locations are at the junctions between freely moving segments and retroperitoneally or adhesionally fixed segments. Literature report that about 90% of intussusceptions in adults have a lead point. The result is bowel obstruction and inflammatory bowel changes ranging from thickening to ischemia of the intestine wall (21).

Diagnosis

Preoperative diagnosis of intussusception is very challenging and difficult due to the variability of the clinical presentation. Plain abdominal films are the first diagnostic method, since in most cases the symptoms of intestinal obstruction dominate the clinical picture. Abdominal films usually reveal signs of intestinal obstruction and usually provide information regarding the possible site of obstruction (22). 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, during which a "cup-shaped" filling defect or "spiral" or "coil-spring" appearances are sometimes characteristically demonstrated (23).

In addition, ultrasonography is widely considered a useful method for the diagnosis of intussusceptions (24). Interestingly, the imaging features of intussusception inclu-

de the famous "target" or "doughnut" signs on the transverse view and the "pseudo-kidney" or "hay-fork" sign in the longitudinal view (25). Undoubtedly, this procedure requires an appropriate interpretation by an experienced radiologist, in order to establish the diagnosis of intussusception. However, obesity and the presence of massive air in the distended bowel loops can many times limit the image quality and the diagnostic accuracy of this method (26).

Computed tomography (CT) seems to be the most important and sensitive diagnostic method in making a preoperative diagnosis of adult intussusception, especially in patients presented with non-specific abdominal pain (27, 28). Interestingly, the reported diagnostic accuracy of CT is 58%-100% (29). The characteristic imaging features of CT include an unhomogeneous "target" or "sausage"- shaped soft- tissue mass with a layering effect. Typical are also considered mesenteric vessels within the intestinal lumen (30). An abdominal CT scan may define the location, the nature of the mass, its relationship to surrounding tissues and, moreover, it may help staging the patient with suspected malignancy causing the intussusception. Is also reported recently that abdominal CT is able to distinguish between intussusception without a lead point including images of no proximal bowel obstruction, target-like or sausageshaped mass and layering effect from intussusception with a lead point providing characteristic images such as signs of bowel obstruction, bowel wall edema with loss of the classic three-layer appearance due to impaired mesenteric circulation (31). For these reasons, we suggest that all patients presenting with a clinical picture of intestinal obstruction should have an abdominal CT scan as a standard diagnostic procedure.

Treatment

All the researchers agree that for adult intussusception laparotomy is the treatment of choice rather than attempts at hydrostatic reduction in view of the high incidence of underlying malignancy (32). Undoubtedly, controversy remains as to whether reduction of the intussusception should be attempted intraoperatively. Some reports advocate reducing the intussusception before resection (33). The reported drawbacks of this method is that malignant cells may be disseminated during the attempt. Thus, no clear evidence exists on this issue. On the other hand, the advantages of reducing the intussusceptions, especially when the small bowel is involved, are that it may be possible to preserve important lengths of small bowel and to prevent possible development of short bowel syndrome (34). Interestingly, some authors suggest intestinal resection without reduction when the bowel is inflamed and ischaemic. In addition, immediate resection is reccommended also in colo-colic intussusception given the high possibility of underlying malignant lesion. In all other cases reduction should always be attempted (35). Other authors suggest that surgical resection without reduction should be the standard treatment in adults, as about 50% of colonic and enteric adult intussusceptions are associated with malignant lesions. Simple reduction is reccommended in idiopathic intussusceptions where no pathological underlying lesion is present (36).

Treatment of gastroduodenal intussusceptions usually entails reduction of the intussusception and surgical excision of the lead point. In coloanal intussusceptions, the preferred approach is to reduce the intussusception and then proceed with the resection (37). However, it is not usually easy to reduce the intussusception and there is always a high risk of disseminating tumor cells. Most surgeons worldwide agree that adult intussusception requires standard surgical intervention because of the high incidence of malignancy. However, the extent of bowel resection and the manipulation of the intussuscepted bowel during reduction remain to be clarified. In contrast to children, where intussusception is benign, preoperative reduction with barium or air is not recommended for adults. The risk of preliminary manipulation includes tumor dissemination. Other drawbacks include the increased risk of anastomotic leakage because of the possible wall bowel weakness during manipulation and the potential bowel perforation (38). Therefore, in patients with ileo-colic, ileo-cecal and colocolic intussusceptions, due to the high incidence of underlying bowel malignancy, formal resections using appropriate oncologic techniques are recommended (39). Is widely reported that, for right-sided colonic intussusceptions, resection and primary anastomosis can be carried out safely, while for left-sided cases resection with construction of a colostomy and re-anastomosis at a second stage is considered safer. When a preoperative diagnosis of a benign lesion is established, the operating surgeon may reduce the intussusception and proceed, if necessary, to limited resection. In addition, minimally invasive tecniques have been used successfully in selected cases. The choice of using a laparoscopic or open procedure depends on the clinical condition of the patient and especially on the surgeons advanced laparoscopic experience (40-43).

Conclusion

Adult bowel intussusception is a rare and challenging condition for the surgeon. Preoperative diagnosis is often missed or delayed because of non-specific symptoms. The operating surgeon should be familiar with the various treatment strategies, because usually the real cause of the intussusception is diagnosed by laparotomy. The most important factor in the diagnosis of adult intussusception is the awareness of its possibility, when dealing with patients with vague abdominal pain because a missed diagnosis may lead to dramatic consequences.

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