Brief communication

CT features of symptomatic adult intussusception with surgical correlation: a study of six cases

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Article history

Received 04 November 2013
Revised 13 January 2014
Accepted 14 January 2014
Early online 25 February 2014
Print 28 February 2014

Abstract

Adult Intussusception is a rare cause of bowel obstruction and is often secondary to a benign or malignant tumour. This study describes the CT features of 6 surgically managed cases of adult intussusception presenting with signs of intestinal obstruction between 2010 and 2012. All had CT scan followed by surgical resection of bowel obstruction. The clinical, imaging and surgical data of these 6 cases is analysed. Pre-operatively CT scan correctly diagnosed intussusception in all cases. Of them five had a mass lesion as lead point. One had past history of gastric surgery. The tumours were adenocarcinoma (n=2) and one each of Non-Hodgkin’s Lymphoma (NHL), inflammatory polyp and sub-mucosal lipoma. The patient with NHL had multiple polyps and multiple intussusceptions. Pre-operative CT scan precisely depicted the underlying cause, mechanism and anatomy of intussusceptions. A tumour is the lead point in most cases of adult intussusceptions.

Key words: bowel obstruction, intussusception, leading point

Adult Intussusception represents about 1% of all bowel obstructions and 5% of all intussusceptions¹. It presents with a variety of acute, intermittent or chronic symptoms. Hence pre-operative clinical diagnosis can be misleading. Computed tomography shows a diagnostic yield around 78% in some studies. Additionally, it helps in identifying the underlying cause². The treatment is usually surgical, as more than half of colonic and enteric intussusceptions in adult are associated with malignancy. In view of its rarity, we are presenting the imaging features of six adult patients with symptomatic intussusceptions who had CT scan and subsequently treated surgically.

Material and methods

The clinical, imaging and surgical records of six surgically managed cases of symptomatic intussusception above the age of 18 years from January 2010 to May 2012 were reviewed retrospectively. Ultrasound and CT scans were done in all cases. None of them had any barium study. All available images were studied in depth for the anatomical details and the underlying barium study. CT scans of asymptomatic and transient bowel intussusceptions were not included.

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Table 1: Clinical, radiological and operative features of the included 6 cases

<table>
<thead>
<tr>
<th>Case number</th>
<th>Age/Sex</th>
<th>Clinical presentation</th>
<th>Radiological findings</th>
<th>Operative findings</th>
<th>Final diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Fig 1)</td>
<td>50/M</td>
<td>Epigastric pain, bilious vomiting since 3 days; h/o previous surgery</td>
<td>Jejunogastric intussusception. No mass was observed</td>
<td>Long segment intussusception of efferent loop to stomach. Oedematous efferent loop; Surgery done: Jejunojejunostomy between afferent and efferent loops.</td>
<td>Retrograde Jejuno-gastric intussusception</td>
</tr>
<tr>
<td>2 (Fig 2)</td>
<td>50/M</td>
<td>Bleeding per rectum-3 months</td>
<td>Colocolic intussusception with large soft tissue growth at lead point.</td>
<td>Polypoidal growth at hepatic flexor with intussusception Surgery: Right hemi colectomy, ileotransverse anastomosis, adhesion lysis of small bowel</td>
<td>Colocolic intussusception with adenocarcinoma colon</td>
</tr>
<tr>
<td>3 (Fig 3)</td>
<td>45/M</td>
<td>Intermittent colicky pain, vomiting for last 2 months; Vague lump in right iliac fossa</td>
<td>3 Ileoileal intussusceptions and 1 ileocolic intussusception with small polyps.</td>
<td>Two intussusceptions – one ileoileal 15cms from ileocolic junction and another in ileocolic junction; multiple polyps in ileum- largest one 6x4 cms; Post-operative CT shows right inguinal nodes.</td>
<td>Multiple ileoileal and ileocolic intussusceptions in a case of NHL (two were transient)</td>
</tr>
<tr>
<td>4 (Fig 4)</td>
<td>40/M</td>
<td>Abdominal pain-1 month</td>
<td>X-ray: multiple air fluid levels. CT: dilated small bowels; ileocolic intussusception; well-defined soft tissue mass at lead point.</td>
<td>Ileocolic intussusception 5x6cm polyp at terminal ileum; Small lymph nodes in mesentery dilated terminal ileum. Right hemi-colectomy done.</td>
<td>Ileocolic intussusception due to inflammatory fibroid polyp.</td>
</tr>
<tr>
<td>5 (Fig 5)</td>
<td>49/M</td>
<td>Loose stools associated with blood and mucus and intermittent abdominal pain since 7 months.</td>
<td>Intussusception of sigmoid colon into rectum. Large polypoidal growth at lead point.</td>
<td>8x8 cms polypoidal growth in sigmoid with colocolic intussusception. Sigmoidectomy done.</td>
<td>Well differentiated adenocarcinoma with colocolic intussusception</td>
</tr>
<tr>
<td>6 (Fig 6)</td>
<td>37/F</td>
<td>Colicky abdominal pain, bilious vomiting, loose stools-3 days; distended abdomen with generalised tenderness</td>
<td>Ileocolic intussusception; lead point was a lipoma</td>
<td>Ileocolic intussusception submucosal lipoma, 3x3 cm in the ileum (at lead point); mild ascites and dilated jejunal and ileal loops; right hemi colectomy done</td>
<td>Submucosal lipoma at terminal ileum with ileocolic intussusception.</td>
</tr>
</tbody>
</table>
Fig 1. Case 1: A 50 year old male patient showing retrograde jejuno gastric intussusception - longitudinal section showing tube within tube appearance (long arrow).

Fig 2. Case 2: A 50 year old male patient showing colocolic intussusception in CT scan with polypoidal growth of hepatic flexor acting as the lead point.

Fig 3. Case 3: A 45 year old male patient with NHL of ileum showing three intussusceptions, one in ileocolic (white arrow), another two in ileoileal (thick arrow pointing the transient intussusception).

Results

There were six cases in this analysis. The presentation, imaging findings and surgical details of these patients are depicted in the table 1. The average age was 45.1 years with a range of 37 to 50 years. Five of the six patients were males. CT scan was diagnostic of intussusception preoperatively in all six cases. There were ileocolic (n=2), colocolic (n=2) retrograde jejuno gastric (n=1) and a multiple ileo-ileal / ileocolic intussusceptions in this study.

In five of the six cases, a mass lesion, either benign or malignant tumour clearly demonstrated as the lead point. The surgical findings were concurrent with CT scan diagnosis in all cases. These tumours were of varied aetiology- adenocarcinoma of colon (n=2), Non-Hodgkin’s Lymphoma-NHL (n=1), inflammatory fibroid polyp (n=1) and submucosal lipoma (n=1). The patient with NHL is a 45 year old male (Case number 3) presented with intermittent colicky pain and vomiting for last 2
months. He had a vague lump in right iliac fossa. The CT scan revealed multiple polyps and multiple intussusceptions which were confirmed later at surgery. In one case, there was history of previous gastric surgery done 15 years back (details of which are not known). However endoscopy in this patient showed a deformed duodenal cap. Post-operative adhesive bands may be the lead point in this case.

**Discussion**

Intussusception occurs when a proximal segment of bowel telescopes into adjacent distal segment (intussusceptum). About 80-90% of intussusceptions are secondary to an underlying pathology. Two thirds of these are due to benign/malignant neoplasms. Non-neoplastic processes account for 15-25% and idiopathic causes are seen in 10%^3.

Diagnosis and treatment of adult intussusception is often a surgical procedure. However CT scan is increasingly found to play an important role in diagnosis. The diagnostic yield is about 78% and it also help in identifying underlying cause/ lead point^3. The imaging appearance of bowel within bowel with or without contained fat and mesenteric vessels can be pathognomonic. It appears as sausage shaped in long axis and target-like in transverse section. Twisting or severe constriction of mesenteric vessels may result in vascular compromise with subsequent oedematous thickening of bowel wall. Masses in bowel lumen act as an irritant and provoke abnormal peristalsis which leads to telescoping of one bowel segment over the adjacent segment. Tumour acting as lead point may be outlined distal to tapered lumen of intussusception. Barium reflux in the lumen of space between the intussusceptum and intussusceptiens allows the coiled spring to be visualised.

Retrograde jejunal intussusception may occur as post-operative complication of roux-en-y anastomosis. The underlying pathology is unknown. Retrograde peristalsis without an associated abnormality is most common cause^4. Intussusception following abdominal surgery may be related to variety of predisposing factors like anastomotic suture line, previous jejunostomy site adhesion (Fig1), submucosal bowel oedema, intestinal dysmotility and electrolyte imbalance.

Small bowel intussusception in adult is secondary to benign lesion in most cases and malignant lesion is seen in 15% and idiopathic in 20%^5. Benign causes of ileocolic intussusception are lipoma, inflammatory fibroid, polyp, hamartoma, haemangioma, leiomyoma, and neurofibroma; whereas lymphoma, carcinoma of ileum/caecum, Gastro-intestinal Stromal tumour (GIST), and metastases are the common malignant causes.

**Fig 5.** Case 5: A 49 year old male presented with colocolic intussusception- axial image of lower abdomen revealing intussusceptum and intussusceptiens in Fig 5a and lead point in Fig 5b

**Fig 6.** Case 6: A 37 year old female patient presented with bowel obstruction. On CT scan submucosal lipoma presenting as lead point of intussusception (arrow)
Gastrointestinal lipomas are not uncommon and can occur anywhere along the gut. They are the second most common in small bowel after GIST. Ileum is the most common site. Peak age incidence is from 5th to 7th decade. Female preponderance is common. Lesions are usually solitary and size may be 1-3 cms. Size >4cms produce intussusception. Lipoma serving as a lead point is identified as a mass of fat density that does not contain blood vessels (Fig 6). Mesenteric fat entrapped in an intussusception has also fat density but has blood vessels coursing through it and can thus be distinguished from lipoma. The latter is submucosal in 90% cases and is detected incidentally. Close observation of consecutive axial images and MPR can help in accurate diagnosis.

Inflammatory fibroid polyp is chronic inflammatory disease of digestive tract which mimics submucosal tumour. Other names for it are inflammatory pseudo-tumour or inflammatory myofibroblastic tumour. They commonly occur in stomach, but can be seen in ileum or colon. Lesions can occur at all ages but is more prevalent in 5th and 6th decade. It consists of loose connective tissue which is rich in vascular and abundant fibrous component. Lesions may be sessile/polyoidal as in our case (Fig 4). Ulceration of overlying mucosa may be there. Small bowel IFP usually presents with bowel obstruction/intussusception.

In large bowel intussusception more than 50% cases are malignant lesions including adenocarcinoma and lymphoma. Benign lesions constitute 30% and they include lipoma, GIST, adenomatous polypl, endometriosis, anastomosis. Incidence of intestinal obstruction as a complication of colorectal cancer is 4-25%. Felix et al reviewed 1,214 reported cases of intussusception in adults and estimated 63% of all intussusception are due to adenocarcinoma. In imaging individual layers are more clearly distinguished from mass. We had 2 cases of large polyoidal growth in hepatic flexor and sigmoid colon presenting as intussusception (Fig 2 and 5). Sigmoidorectal intussusception is rare. Rectal intussusception is concentric invagination of entire rectum that progress towards anal canal but does not protrude through anus.

Primary NHL of GIT is most common extra nodal NHL. Mantle cell lymphoma (MCL) comprises 5-10% of all NHL which manifests as numerous, small, spherical polypl (MLP). MLP presenting as intussusception is rare and present only in 1% of bowel obstruction. There are only few case reports in literature. We had one case of multiple intussusceptions in a patient with NHL- ileoileal (n=3), ileocolic (n=1) (Fig 3). One ileoileal and one ileocolic intussusception were identified and other two were transient. Multiple polypls with the largest one of size 6 cms were seen in ileum and it was proven to be NHL on biopsy. Subsequent scan revealed inguinal adenopathy which was a later development. MCL is aggressive type of B cell lymphoma and characterised by multiple polyoidal lesions in GIT, ascending colon, small bowel particularly terminal ileum and ileocecal region. These polypls are sessile/pedunculated or both. Their sizes can vary from 2 to 5cms.

Transient intussusception may be observed in patients with celiac disease, crohn’s disease, malabsorption and intestinal tumours. Sometimes transient intussusception can be seen in absence of organic lesion or malabsorption which is attributed to dysrhythmic contraction. Transient tumour related colocolic intussusception has also been reported.

Conclusion

Adult intussusception is rare and diagnosis is difficult due to its varied presentation. Most common cause in adult intussusception is a malignant or a benign mass lesion. CT scan is not only diagnostic but also shows the lead point and precise surgical anatomy that helps in early and proper surgery.

Conflict of Interest: None to declare

Acknowledgments: None

References