
Case Report

Two cases of adult intussusception diagnosed using multi-detector row computed tomography

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Abstract

Adult intussusception is a rare disease. We describe two patients with adult intussusception in whom multi-detector row computed tomography (MDCT) was useful in making the diagnosis.

In the first case, a 70-year-old man showed intussusception in the long axial direction on the transverse abdominal CT image. The terminal ileum invaginated the ascending colon. There was also a fat density mass, which is considered to be the lead point of intussusception, and lipoma was therefore suspected. Intussusception was found in the short axial direction and the target sign was observed on coronal multiplanar reconstruction (MPR) imaging. Intraoperative findings included a 3-cm movable tumor, 10 cm from the terminal ileum. The patient was histologically diagnosed as having lipoma. In the second case, a 60-year-old man showed a target sign on the transverse abdominal CT image and intussusception in the short axial direction was suspected. The MPR coronal image demonstrated intussusception in the long axial direction; the terminal ileum was observed to be invaginated into the ascending colon and a tumor had formed. The CT image showed enlarged lymph nodes in the mesentery. The patient had ileectomy and was diagnosed as diffuse large B-cell type non-Hodgkins lymphoma.

Many studies have reported the diagnosis of intussusception by CT; however, only a few studies have reported the diagnosis of intussusception by MDCT. In this study, we report the bibliographic consideration for the usefulness of MPR-imaging.

Introduction

Adult intussusception is rare and does not show the specific symptoms observed in pediatric intussusception, often making diagnosis difficult. Furthermore, since adult intussusception frequently occurs as a result of

some organic diseases, surgeries are performed¹⁾²⁾. Since it can also be caused by non-specific acute abdomen, preoperative diagnostic imaging becomes vitally important. In the present study, we describe two patients with adult intussusception, which was diagnosed using MPR imaging by multi-detector row computed tomo-

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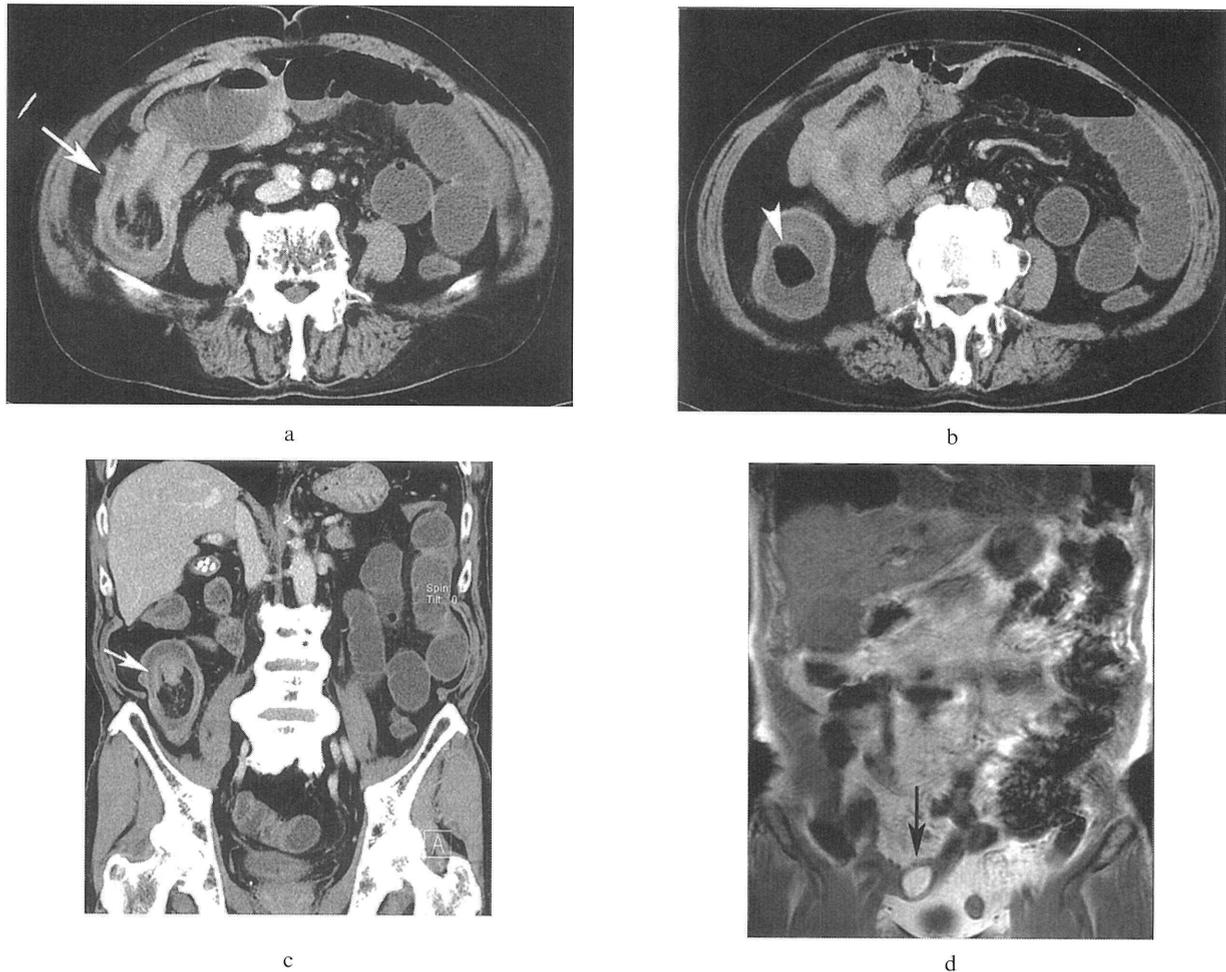


Fig. 1 Case 1 (a 70-year-old man)

- Intussusception is observed in the long axial direction on the transverse abdominal contrast-enhanced CT image and the terminal ileum is found to invaginate the ascending colon (white arrow).
- A fat density mass is seen on the transverse image on the multislice head side from Fig. 1a (white arrowhead).
- Intussusception is demonstrated in the short axial direction on MPR coronal imaging and the target sign is seen (white arrow).
- A high signal mass (30 mm) lesion was demonstrated in the terminal ileum (black arrow) on the T1-weighted MR image, 7 days after CT examination.

graphy (MDCT).

Case 1

The patient was a 70-year-old man. He had always had diarrheal symptoms; however, he developed abdominal pains and nausea three days before admission. He visited the department of gastroenterological medicine, where he was found to have ileus by abdominal X-ray and was admitted. He had a history of hypertension and cholelithiasis.

In hematological examination, the white blood cell (WBC) count increased to $9,500/\mu\text{l}$ but the other peripheral blood parameter were within the normal range. The following parameters increased: lactate dehydrogenase (LDH) 239 U/l; creatine kinase (CK) 177 U/l; creatinine 1.26 mg/dl; blood urea nitrogen (BUN) 29.1 mg/dl; C-reactive protein (CRP) 147 mg/dl. Abnormal findings were not observed in other

parameters, including transaminase. The coagulation system and tumor markers (CEA, CA19-9) were within the normal range.

The transverse abdominal contrast-enhanced CT image showed the terminal ileum to invaginate the ascending colon, indicating that the patient had intussusception (Fig. 1a). A low density mass, considered to be the lead point of intussusception, was observed on the multislice head side (Fig. 1b). The mass had a fat density suspected to be a lipoma. Intussusception was detected in the short axial direction on coronal MPR imaging, and a target sign, a concentric layer structure, was observed in the intestines (Fig. 1c).

To evaluate the composition of the mass, magnetic resonance imaging (MRI) was performed 7 days after CT imaging but an ileus image was not detected, and intussusception was considered to have been reduced

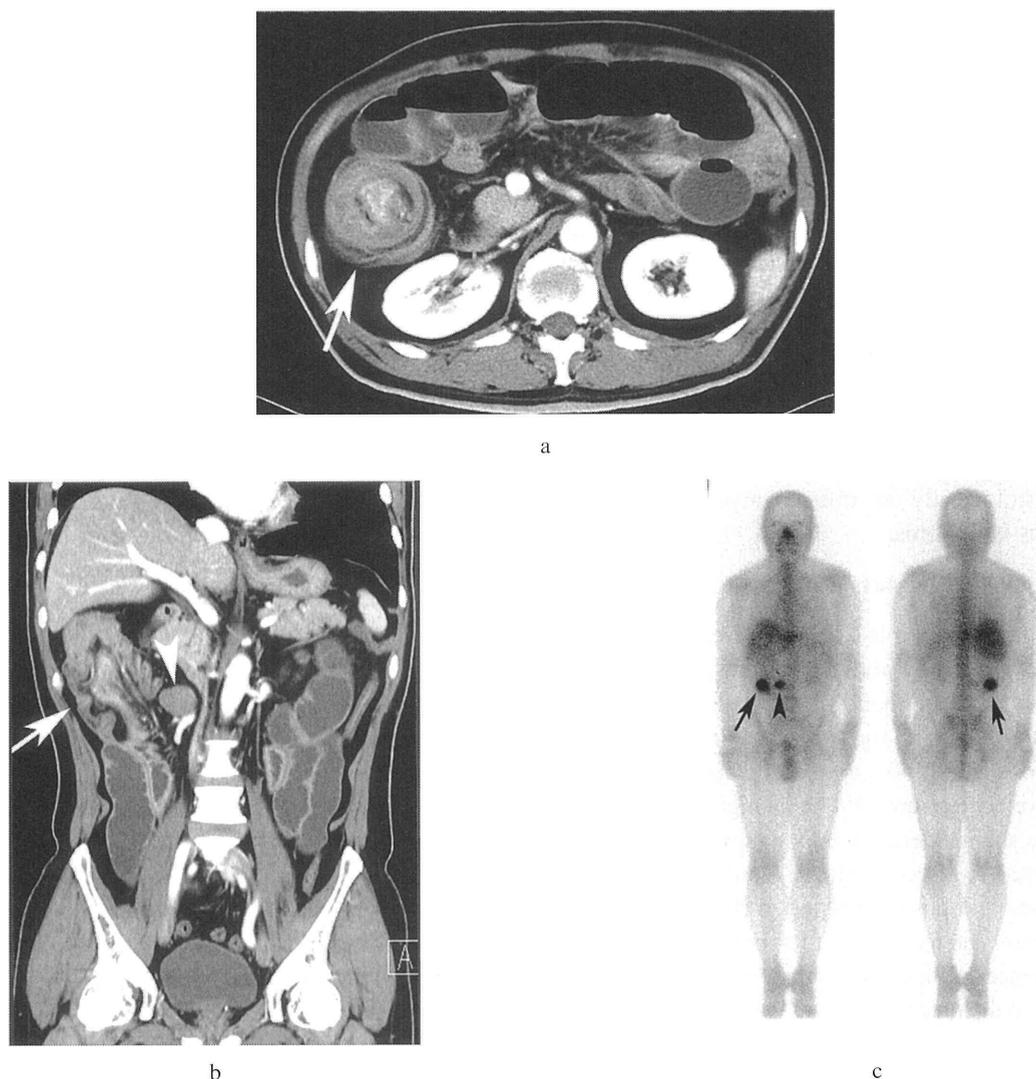


Fig. 2 Case 2 (a 60-year-old man)

- A target sign is seen on the transverse abdominal contrast-enhanced CT image and intussusception in the short axial direction was observed (white arrow).
- The terminal ileum was invaginated into the ascending colon (white arrow) on MPR coronal imaging. Enlarged lymph nodes were observed in the mesentery (white arrowhead).
- Gallium 67 scintigraphy demonstrated a high level of accumulation in a site that was consistent with tumor and lymph nodes on CT imaging.

naturally. A high signal mass lesion (26 mm) was detected in the terminal ileum on T1-weighted image. The mass mostly consisted of fat and was considered to be a lipoma (Fig. 1d).

The intraoperative findings included a 3-cm movable tumor, 10 cm from the terminal ileum, and this was considered to be the lead point of intussusception. Since the adhesion was very severe, the part of the intestine containing the mass was wedge-resected. Histologically, the main constituent of the mass was located in the submucosal layer and because mature lipocytes were observed, lipoma was diagnosed.

Case 2

The patient was a 60-year-old man. He noted onset of pain and distension of the abdomen since the previ-

ous month. Since ileus was detected by abdominal X-ray, he was admitted to the hospital. The patient had a history of surgery for inguinal hernia.

Peripheral blood values were within the normal range. Serum amylase levels decreased to 38 U/l. Total bilirubin increased to 1.4 mg/dl and CRP to 3.81 mg/dl. No distinctly abnormal values were observed among other parameters, including transaminase. Levels of soluble interleukin-2 receptor (sIL-2R) increased to 962 U/ml. The tumor markers CEA and CA19-9 were within the normal range.

A target sign was observed on the transverse abdominal contrast-enhanced CT image, and intussusception was suspected in the short axial direction (Fig. 2a). On the MPR coronal image, the terminal ileum was found

to invaginated the ascending colon (Fig. 2b).

Enlarged lymph nodes were observed in the mesentery, but surrounding invasion was not suggested. Therefore, the patient was suspected of having a malignant tumor, including malignant lymphoma.

Since gallium 67 scintigraphy showed a high level of accumulation at a site consistent with tumor and lymph nodes on the CT image (Fig. 2c), and sIL-2R was high, malignant lymphoma was suspected.

A 50 mm mass was detected at the lead point of intussusception by colonoscopy, and biopsy was performed. Histology revealed the possibility of malignant lymphoma.

Ileocecal resection was performed and the tumor was diagnosed histologically as diffuse large B-cell type non-Hodgkins lymphoma.

Discussion

Adult intussusception is a comparatively rare and is reported to occur in only about 5% of all patients with intussusception¹⁾. More than 90% of adult intussusception is known to be due to tumorous lesions²⁾. Of these tumorous lesions, about 60% have malignant tumor and about 40% have benign tumor³⁾. In benign tumor of the small intestine, the incidence of leiomyoma is the highest (38.1%) followed by lipoma (15.8%) and hemangioma (8.7%). However, it has been reported that when intussusception occurs, the incidence of leiomyoma is only 5% but the incidence of lipoma is high, i.e., 55%⁴⁾. The reasons why small intestinal lipoma easily causes intussusception are as follows. Lipomas are soft, smooth, and pedunculated in many cases and are not fixed to the muscle layer, and are usually motile around the terminal ileum, in which case the intussusception appears more commonly⁵⁾.

Freeman et al.⁶⁾ reported the incidence rates of malignant lymphoma in the gastrointestinal tract as follows: stomach (64%), small intestine (20.3%), colon (10.9%), and rectum (4.3%). Yao et al.⁷⁾ reported that 72.5% of the malignant lymphomas in the small intestine are located in the ileum. In particular, the terminal ileum with developed lymph follicles is a region of occurrence, and 86.7% of malignant lymphomas occur within 40 cm from the Bauhin's valve. Additionally, 30–50% of malignant lymphomas in the ileum are reported to induce intussusception⁸⁾.

The modalities of diagnostic imaging available for the diagnosis of intussusception are ultrasonography, CT and MRI. Many studies have reported the usefulness of CT for the diagnosis of intussusception^{1–3)9–11)}. Ultrasonography revealed a layer structure in the intestinal wall and the mesenteric fat of the invaginated part, and these findings were developed as a multiple concentric ring sign¹²⁾ and target-like¹³⁾. CT revealed a CT

target sign and bowel-within-bowel appearance³⁾. CT target sign is the appearance of the short axial image of the intussusception and is also observed in inflammatory bowel diseases and ischemic bowel diseases¹⁴⁾. Therefore, evaluation of the short and long axial images may be necessary for the diagnosis of intussusception. In the present study, long axial image was observed in the transverse image of Case 1 and MPR-coronal image of Case 2. Warshauer et al.³⁾ reported that they examined 41 intussusceptions on transverse CT image and in 22 observed axial bowel-within-bowel appearances, 4 longitudinal bowel-within-bowel appearances, and 15 both axial and longitudinal bowel-within-bowel appearances. Therefore, not only the transverse image but also the ability to obtain tomographic images at will appear to be necessary for CT diagnosis of intussusception. In our hospital, we use 16-detector row computed tomography. The entire abdomen can be imaged around 10 seconds and MPR image with high space resolution can be obtained. Only one study discussed the use of MDCT diagnosis for intussusception and reported that MPR image is useful for the diagnosis of intussusception¹⁵⁾.

Shimotsuma et al.¹⁶⁾ reported that the apex and neck of intussusception can be identified on transverse CT image. Their study also indicated that it is possible to differentiate whether the intussusception is retrograde or antegrade invagination based on the relationship between both the positions. However, long axial image of intussusception obtained by MPR from MDCT easily differentiates whether it is retrograde or antegrade invagination. In the present study, antegrade invagination was diagnosed in both the patients preoperatively and was later confirmed by surgery.

Diagnosis the existence of tumor at the lead point of intussusception can be made by CT in many cases; however, it is generally believed that qualitative diagnosis is possible only for lipoma¹⁷⁾. In the present study, lipoma could be easily diagnosed in Case 1. Kim et al.¹⁾ stated that CT findings of regional or mesenteric lymphadenopathy associated with a bowel wall mass can help in distinguishing lymphoma from other bowel diseases. In Case 2, malignant lymphoma was preoperatively diagnosed by a combination of CT and gallium 67 scintigraphy.

As stated above, adult intussusception is often due to tumorous lesions. In this case the main treatment option is surgery. In case of emergency surgery, vascular disorder can be evaluated by contrast-enhanced CT¹¹⁾. In addition, unnecessary surgery can be avoided by evaluating the presence of tumor of the lead point¹²⁾.

Conclusion

In the present study, we encountered two adult

patients with intussusception which was diagnosed using MDCT. For this diagnosis, tomographic images in the long axial and short axial directions were useful. The part of the intestine containing the mass was resected surgically in both the patients and the diagnosis was confirmed histologically.

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多列検出器型 CT が有用であった成人腸重積の 2 例

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成人腸重積はまれな疾患であるが、今回我々は多列検出器型 CT (MDCT) が診断に有用であった 2 症例を経験した。

症例 1 は 70 歳の男性。腹部 CT の横断像では腸重積は長軸方向に撮像され、終末回腸が上行結腸内に陥入していた。また、腸重積の先進部と思われる脂肪濃度腫瘍も認められ脂肪腫が疑われた。多断面再構成法 (MPR) 冠状断像では腸重積は短軸方向に撮像され target sign が認められた。術中所見では回腸末端より口側 10 cm の部位に可動性良好な 3 cm 大の腫瘍が認められ、組織学的に脂肪腫と診断された。

症例 2 は 60 歳の男性。腹部造影 CT の横断像では target sign がみられ、短軸方向の腸重積が疑われた。MPR-冠状断像では腸重積は長軸方向に撮像され、終末回腸が上行結腸内に陥入し腫瘍を形成していた。また、CT で腸間膜に腫大したリンパ節が認められた。回盲部切除術が施行され、組織学的に non-Hodgkin's lymphoma, diffuse large B-cell type と診断された。

腸重積の診断に CT での報告は多いが、MDCT による報告は少なく、MPR 像の有用性について文献的考察を加え報告する。

〈キーワード〉 成人腸重積、多列検出器型 CT、多断面再構成法
