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Preoperative radiologic patent blue localization for intracorporeal laparoscopic resection of a terminal ileal submucosal lipoma: A case report

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ABSTRACT

BACKGROUND: Ileal submucosal lipomas are rare cases and surgical intervention was necessary in case of abdominal pain and intussusception. Laparoscopic resection may be difficult for the intraluminal submucosal lesion. Herein, we report a case of terminal ileal submucosal lipoma resected by radiologic-assisted laparoscopic surgery.

CASE PRESENTATION: The 31-year-old female was admitted for intermittent abdominal pain. The colonoscopy showed a 1.5 cm diameter subepithelial lesion in terminal ileum and computed tomography showed a hypodense lesion in distal ileum. The diagnosis of terminal ileal submucosal lipoma without obstruction was impressed and surgical strategy of minimal invasive surgery was taken. Preoperative CT-guided patent blue dye injection near the terminal ileal submucosal lipoma for localization was performed by Radiologist. Then laparoscopic resection with intracorporeal suture was done smoothly without complications. The pathology proved lipoma and she had good recovery within one week.

CONCLUSIONS: There are many kinds of intervention methods to treat the small bowel lipoma. Our experience supports that laparoscopic surgery with radiologic localization assistance is feasible for terminal ileal nonintussusceptive submucosal lipoma resection.

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1. Background

The small bowel tumors account for 1~2% of gastrointestinal tract tumors [1,2]. Benign tumors account for 30% of all small-bowel tumors and lipomas are the second most common benign tumor [1]. Patients usually presented with abdominal pain, nausea, vomiting, gastrointestinal (GI) bleeding and intestinal obstruction. Intraluminal lipomas were left untreated in case of no discomfort because of no malignancy potential. There are some case reports which ileal lipoma patients with intussusception treated by laparoscopic surgery with advance devices and techniques [1,3–9]. However, if the intraluminal submucosal lipoma is small without intussuscep-

tion, it is difficult to be found during laparoscopic surgery. Thus, we report a case of terminal ileal submucosal lipoma that presented with intermittent abdominal pain and was treated by radiologic-assisted laparoscopic surgery. This case report was conducted, and is reported in accordance with the SCARE criteria [10].

2. Case presentation

The 31-year-old female complained intermittent abdominal cramping pain for 4 years and she also had difficulty in stool passage sometimes. No vomiting, nausea nor GI bleeding presented. She had cesarean section once for malpresentation and no history of medical disease. She went to out hospital for help. There was no specific physical examination finding and her laboratory studies were all within normal limits. She received series exams: the plain abdomen was normal without ileus. Then colonoscopy was performed and showed a 1.5 cm diameter subepithelial lesion in terminal ileum (Fig. 1a). Then small bowel series was performed and showed a submucosal lesion at terminal ileum (Fig. 1b). Computed tomography was also arranged and showed a hypodense submucosal lesion (1.5 cm, Hounsfield unit: –61.5) suspected lipoma at distal ileum

Abbreviations: GI, gastrointestinal; EMR, endoscopic mucosal resection; ESD, endoscopic submucosal dissection; LECS, laparoscopic-endoscopic cooperative surgery; CT, computed tomography.

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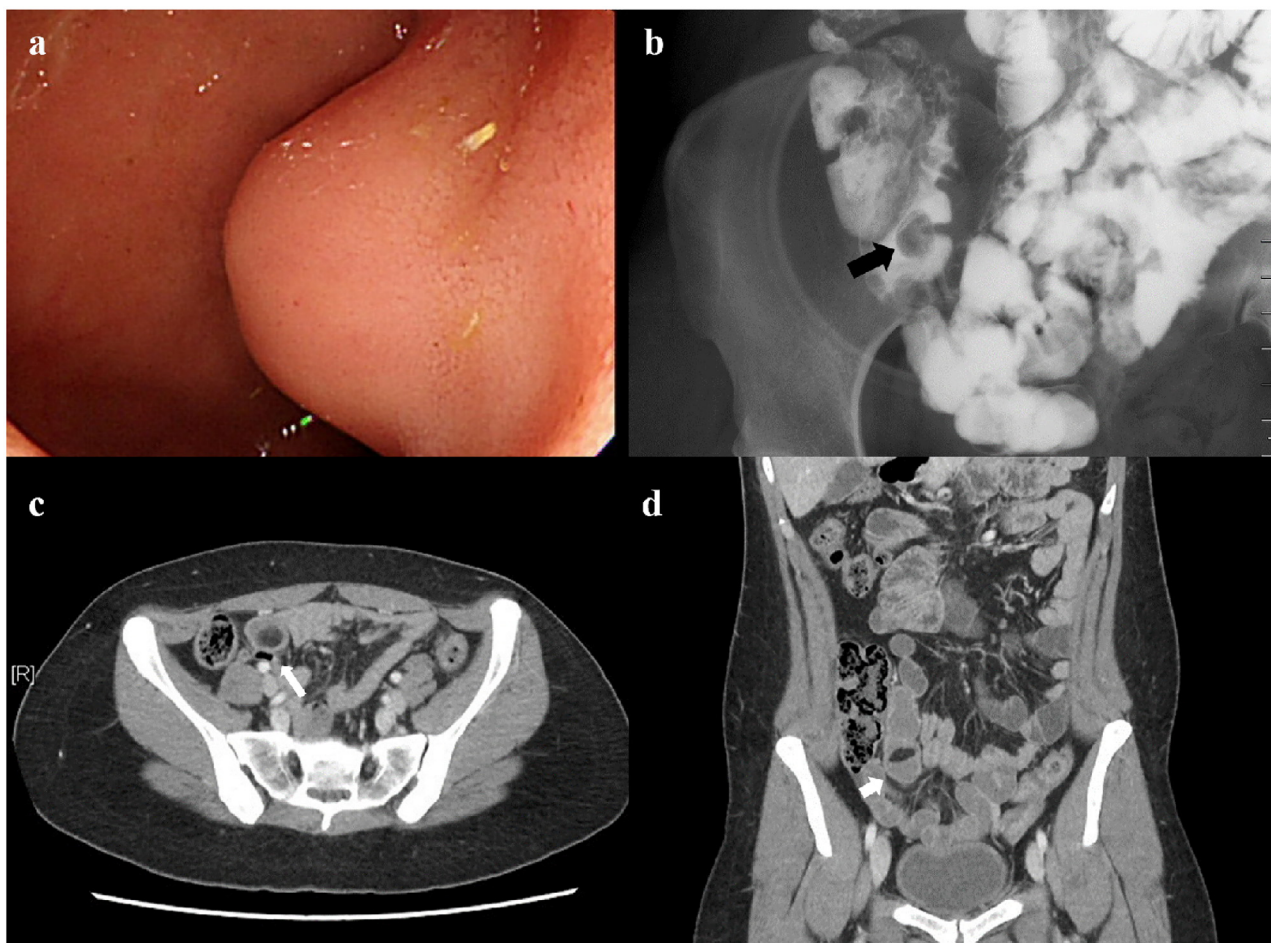


Fig. 1. Preoperative diagnosis of submucosal terminal ileal lipoma. (a) Colonoscopy showed a 1.5 cm subepithelial lesion in terminal ileum. (b) Small bowel series showed a submucosal lesion in terminal ileum (Black arrow). (c) (d) Contrast enhanced CT scan of abdomen showed a hypodense submucosal lesion (white arrow), suspected 1.5 cm lipoma, at distal ileum without ileal obstruction or intussusception.

without ileal obstruction or intussusception (Fig. 1c, d). The diagnosis of terminal ileal submucosal lipoma without obstruction was impressed and she was admitted for surgery.

She underwent minimal invasive surgery for priority. We arranged pre-operative CT-guided patent blue dye injection near the lesion for localization following the below steps. First, one day before operation, the patient was under nothing by mouth for at least 4 hours before CT-guided procedure. Interventional radiologist performed the procedure as the patient was on supine position. Pre-procedural CT scanning was done firstly to delineate location of lesion. 10 cc of Xylocaine (2%) was administered as local anesthesia and 20 mg of Buscopan was injected intravenous simultaneously.

Under CT-guidance, a 21G needle with stylet was used to puncture into lesion. The location of needle tip was checked by CT (Fig. 2a) and about 1 cc of patent blue was injected into lesion as pigment mark for localization. The post-procedure CT scan was done as to evaluate any complication. Then laparoscopic tumor resection was arranged on the next day. The operation was performed step by step: a skin incision below umbilicus was created and a 12 mm Trocar was inserted. Pneumoperitoneum was created by carbon dioxide to pressure of 12 mmHg. Under the laparoscopy, another three wounds were created and 5 mm Trocars were inserted. One at middle lower abdomen above pubic bone, one at right lower abdomen and the other at left lower abdomen. After entering abdominal cavity, the blue dye mark at terminal ileum was seen. The terminal ileum was opened around two centimeters at antimesenteric side near the blue dye mark by energy device. The

submucosal lesion was seen when entering the lumen of distal ileum and it was externalized out of the ileum (Fig. 2b). The lipoma was resected at base by monopolar-scissor device and the lesion was taken out via 12 mm trocar. Then ileum submucosal defect and ileotomy were sutured by Dexon 3.0 intracorporeally for the lesion very near ileocecal junction (Fig. 2c). The bleeding was minimal, and one Jackson-Pratt drain was left in the Cul-de-sac. The wound was closed. The gross specimen was showed (Fig. 2d) and pathology proved lipoma. The postoperative condition was uneventful with smooth gastrointestinal function resumption and she was discharged within one week.

3. Discussion and conclusions

The small bowel tumors account for 1~2% of gastrointestinal tract tumors [1,2]. They can be classified as malignant or benign origin. Benign tumors account for 30% of all small-bowel tumors and lipomas are the second most common benign tumor [1]. The symptoms of small bowel lipomas include abdominal pain, nausea, vomiting, GI bleeding and intestinal obstruction. The indication of surgical intervention is according to clinical symptoms. In our case, she suffered intermittent abdominal pain for 4 years and was indicated for surgery.

There are many intervention methods for small bowel lesions including laparotomy [11], laparoscopic surgery [1,3–9], endoscopic mucosal resection (EMR), endoscopic polypectomy [1,12,13] and endoscopic submucosal dissection (ESD) [14,15] (see Table 1).

Table 1
Literature review of management for terminal ileum submucosa lesion.

case	General information			Tumor			Management method		
	Age	Sex	Clinical presentation	Pathology	Location	Size, max (mm)	Approach method	Bowel resect	CT-guided blue dye localization
Tsushimi et al. [1]	63	F	Abdominal pain, Intussusception	Lipoma	Terminal ileum	25	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Hou et al. [3]	64	F	Abdominal pain Intussusception	Lipoma	Terminal ileum	N.D ^d	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Lin et al. [4]	47	F	Abdominal pain Intussusception	Lipoma	Ileum	30	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Abbasakoor et al. [5]	52	F	Abdominal pain Intussusception	Lipoma	Terminal ileum	40	Laparoscopy, intracorporeal anastomosis by staple	Yes	No
Park et al. [6]	39	M	Abdominal pain Intussusception	Lipoma	Terminal ileum	40	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Shimazaki et al. [7]	87	M	Abdominal distension Intussusception	Lipoma	Ileum ^b	40	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Saito et al. [8]	31	M	Hematochezia Intussusception	Lipoma	Terminal ileum	40	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Takahashi et al. [9]	70	F	Abdominal pain Intussusception	High-grade tubular adenoma	Terminal ileum	50	Laparoscopic-assisted, extracorporeal anastomosis	Yes	No
Jiang et al. [11]	50	M	Abdominal pain Intussusception	Lipoma	Terminal ileum	40 ^c	Laparotomy, intracorporeal anastomosis	Yes	No
Yoshimura et al. [12]	80	F	Abdominal pain	Lipoma	Terminal ileum	25	EMR	No	No
Matsumoto et al. [13]	72	M	Nil	Lipoma	Terminal ileum	30	Endoscopic polypectomy	No	No
Noda et al. [14]	78	F	Abdominal pain	Lipoma	Terminal ileum	40	ESD	No	No
Morimoto et al. [15]	62	M	Hematochezia	Lipoma	Terminal ileum	50	ESD	No	No
Present case	31	F	Abdominal pain	Lipoma	Terminal ileum	15	Laparoscopy, intracorporeal hand suture	No	Yes ^a

^a CT-guided blue dye localization is assisted.

^b Patient status post ileocecal resection due to cecal cancer. 40 cm proximal to neo-terminal ileum.

^c Two tumors, the maximum size is 40 mm.

^d Multiple submucosa lipoma. N.D.: No data. EMR: endoscopic mucosal resection. ESD: endoscopic submucosal dissection.

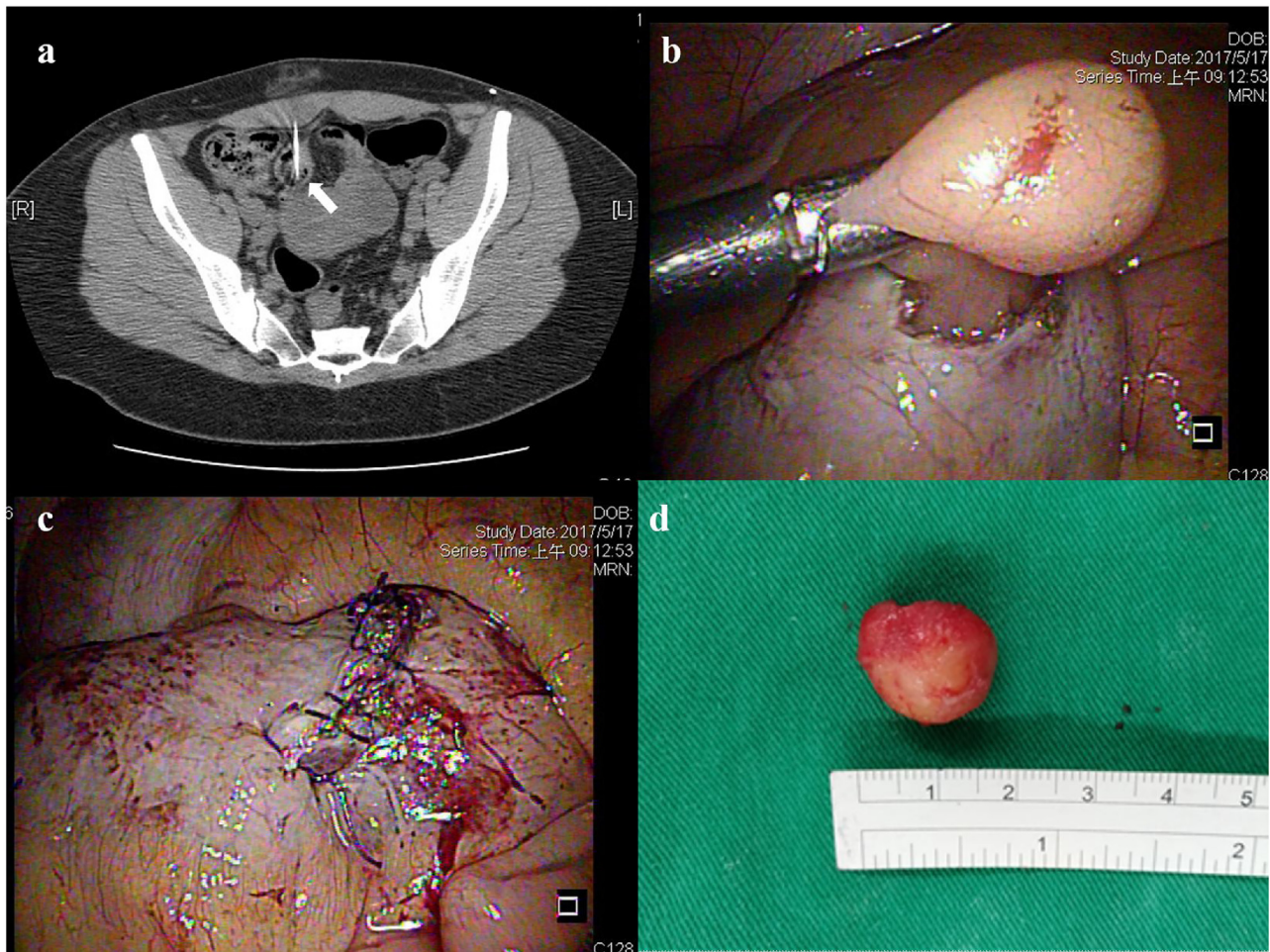


Fig. 2. Intraoperative minimal invasive surgery of submucosal terminal ileal lipoma. (a) CT-guided patent blue dye injection near the terminal submucosal lesion for localization (white arrow). (b) The submucosal lesion was pulled out of the terminal ileum. (c) The terminal ileotomy was sutured by Dexon 3-0 intracorporeally. (d) The lipoma of 1.5 cm was shown grossly.

EMR and ESD needs experienced techniques and has been widely used in gastric and colorectal tumors [16,17]. However, there are only two case reports for ESD [14,15] used successfully in ileal lipomas resection. Surgical resection is still the most common management for ileal lipomas. According to previous case reports about laparoscopic surgery of lipoma or adenoma, operator saw the intussuscepted pointed lesion under laparoscopy. They can find the location of lesion and resect easily [1,3–9]. For the small lesion without intussusception, it is more difficult to identify the lesion under laparoscopy. Because of elective surgery in this case, we considered laparoscopic surgery as priority. Pre-operative localization was discussed with this patient. However, the patient refused colonoscopy assisted dye injection because of severe abdominal pain during colonoscopy examination. We discussed with Radiologist and arranged CT-guided blue dye injection near the lesion by Radiologist. During surgery, we can find the lesion easily because of the blue dye mark. The surgery was performed totally under the laparoscopic method successfully.

Our successful experience supports that laparoscopic surgery with radiologic localization assistance is feasible for terminal ileal nonintussusceptive submucosal lipoma resection.

Conflicts of interest

All authors had no financial and personal relationships with other people or organisations.

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Ethical approval

The study was approved by Institutional Review Boards, Chang Gung Memorial Hospital (IRB No.: 201701356B0).

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Hsin-Yi Wu and Song-Fong Huang are contributed to this paper equally.

Hsin-Yi Wu and Song-Fong Huang draft the work.

Kuang-Tse Pan is responsible for lesion localization.

Ming-Chin Yu is responsible for treatment design and paper revision.

Registration of research studies

The research registry UIN is researchregistry3415.

Guarantor

Ming-Chin Yu is the guarantor.

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