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Single Case

Colonic Endoscopic Submucosal Dissection for a Granular Cell Tumor with Insufficient Endoscopic Manipulation in the Hepatic Flexure

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Keywords
Colon · Endoscopic submucosal dissection · Granular cell tumor · Hepatic flexure · Subepithelial tumor

Abstract
This report describes a granular cell tumor (GCT) with insufficient endoscopic manipulation in the hepatic flexure (HF) of the colon, which was treated by endoscopic submucosal dissection (ESD) using a splinting tube and the spring S-O clip traction method. A 44-year-old man presented with a 10 mm subepithelial tumor in the HF near the ascending colon on colonoscopy. The lesion had a smooth surface without erosion. The histology of biopsied specimen from the lesion was suspected as a GCT. Most GCTs are considered low-grade malignant, but ESD was chosen to treat the lesion due to the patient's insistence on endoscopic treatment. Because the lesion was located in the HF, it was assumed that the scope manipulation during ESD would be difficult. During ESD, a splinting tube was utilized to stabilize endoscopic manipulation and the spring S-O clip traction method to keep clear visualization of the submucosa, and the procedure was completed without adverse events. An 8 × 7 mm lesion with negative margins was removed by ESD. Hematoxylin and eosin staining showed atypical cells with round-to-oval nuclei and acidophilic vesicles, and immunohistochemical staining for S-100 protein

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was strongly positive with a Ki-67 labeling index of 5%. The lesion was pathologically confirmed as a GCT. This case showed the usefulness and safety of ESD for GCT with insufficient endoscopic manipulation in the HF.

Introduction

Granular cell tumors (GCTs), which are derived from Schwann cells, can develop throughout the body, including the oral cavity and skin. The prevalence of GCTs in the gastrointestinal tract is reported to be 3–9% [1]. In the gastrointestinal tract, the esophagus is the most common site of GCT occurrence, while the colon is rarely involved. GCTs present as subepithelial tumors (SETs) in the gastrointestinal tract, extending from the lamina propria mucosa to the submucosa. Pathologically, most GCTs are considered low-grade malignant. However, < 2% of cases exhibited malignancy potential, suggested by endoscopic findings of surface ulcers or lesions >40 mm [2].

Accurate diagnosis of GCTs using biopsy or endoscopic ultrasonography (EUS) is often considered to be difficult [3, 4]. Especially, it is difficult to obtain conclusive diagnosis and perform endoscopic resection for lesions in the hepatic flexure (HF) of the colon, due to the technical demands of endoscopic manipulation. We report a case of GCT with insufficient endoscopic manipulation in the HF of the colon, which was safely treated by endoscopic submucosal dissection (ESD) using a splinting tube and the spring S-O clip traction method.

Case Report

A 44-year-old man underwent colonoscopy, which revealed an SET in the HF of the colon. Three years prior, he visited a hospital for positive fecal occult blood test. He was followed up without treatment but tested positive for fecal occult blood again. He had no abdominal symptoms, and his laboratory findings were normal. Aside from the SET, his medical history was unremarkable. He underwent endoscopy in our hospital, which showed a 10 mm SET, without ulceration or cushion sign (Fig. 1). Based on pathological findings of a biopsy sample, GCT was suspected by hematoxylin and eosin (HE) staining. However, immunohistochemical staining could not be performed due to the small amount of a biopsied specimen, and the conclusive diagnosis and evaluation of malignancy could not be confirmed. Furthermore, EUS via the water-filling method using an ultrasound probe demonstrated that this lesion might be derived from the second or third layers; however, it did not provide additional information for the differential diagnosis of SET due to the insufficient manipulation of the scope (Fig. 1d). Computed tomography showed no lymph node or distant organ metastasis. The patient strongly desired to undergo endoscopic treatment because the possibility of malignancy had not been excluded. Therefore, en bloc resection of the lesion was performed by ESD to obtain an accurate pathological diagnosis.

ESD was performed using a single-use splinting tube with an inflatable balloon (ST-CB1; Olympus Optical Co. Ltd, Tokyo, Japan) for stable endoscopic manipulation (Fig. 2a, b). First, a transparent tip hood (DH-28 GR; Fujifilm Medical Co., Ltd., Tokyo, Japan) was used to maintain clear visibility while ESD procedure. Then, glycerol with diluted indigo carmine was injected into the submucosa, followed by the injection of a sodium hyaluronate solution. Mucosal incision and submucosal dissection were then performed using a Dual knife (KD-655Q; Olympus Optical

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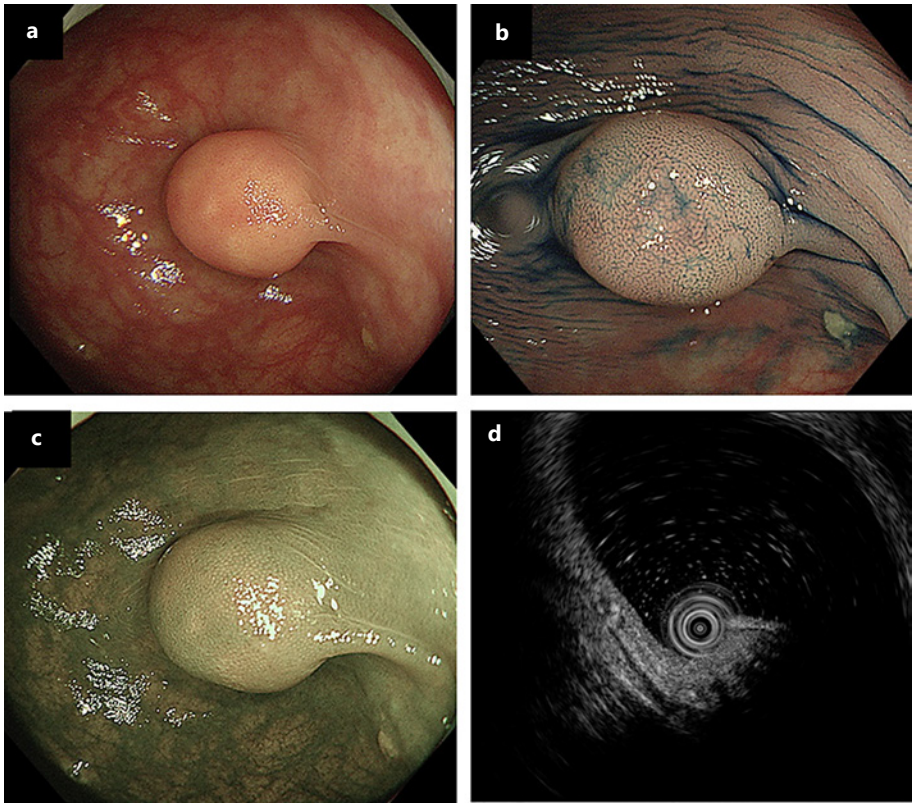

Fig. 1. Endoscopic findings of the lesion. **a** The lesion shows a SET. A bridging hold was observed on the smooth surface of the lesion under white light; the lesion has a solid appearance. **b** Image after indigo carmine spraying. No ulcer or erosion is observed on the lesion surface. **c** No irregular vessels are observed on the lesion surface in narrow-band imaging. **d** EUS indicated that this SET might be located at the second or third layers but did not provide additional information due to poor endoscopic manipulation and deep echo attenuation.

Co. Ltd, Tokyo, Japan) and IT knife nano (KD-612Q; Olympus Optical Co. Ltd, Tokyo, Japan). Because fibrosis was observed in the submucosa (Fig. 2c, d), the spring S-O clip traction method (TC1H05, Zeon Medical Tokyo, Tokyo, Japan) facilitated submucosal dissection (Fig. 2e). Finally, en bloc resection was achieved in 44 min without any adverse events (Fig. 2f).

An 8 × 7 mm lesion was resected. Histology of the resected specimen revealed proliferative, alveolar, epithelial-like cells with granular cytoplasm in the submucosa. Atypical cells with round-to-oval nuclei and acidophilic vesicles were observed on HE staining (Fig. 3a, b). Moreover, immunohistochemical staining for S-100 protein was strongly positive, and the Ki-67 labeling index was 5% (Fig. 3c, d). Consequently, the lesion was diagnosed as a low-grade GCT. Curative resection with negative margins was performed, and no recurrence was observed 6 months subsequently.

Discussion

This report describes a case of GCT with insufficient endoscopic manipulation in the HF of the colon, which was treated via ESD using a splinting tube and the spring S-O clip traction method. To the best of our knowledge, this is the second report of colonic GCT treated with ESD. A previous report of 11 cases of colonic GCTs, which were treated via ESD, suggested that

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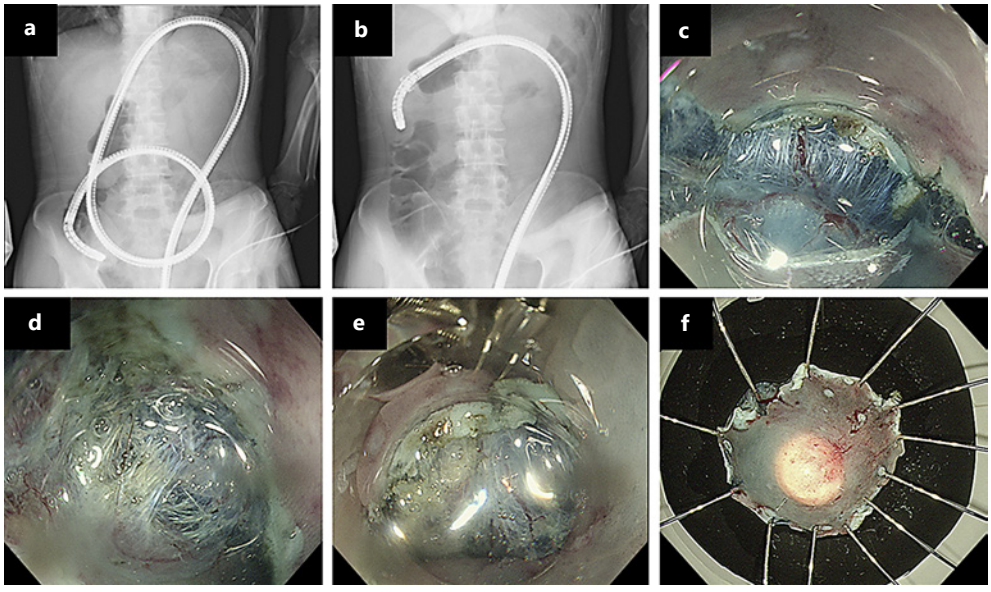

Fig. 2. Endoscopic images during ESD. **a** A loop was formed in the transverse colon, and the scope manipulation was poor. **b** A single-use splinting tube was placed before the ESD procedure. **c** Poor visualization of the cutting area makes colorectal ESD difficult. **d** Mild fibrosis is identified during the dissection of the submucosa. **e** The edge of the exfoliated mucosa was attached with the spring S-O clip, which makes cutting submucosal area more visible. **f** Immediately after ESD, the resected specimen is measured and is found to be 25 × 20 mm.

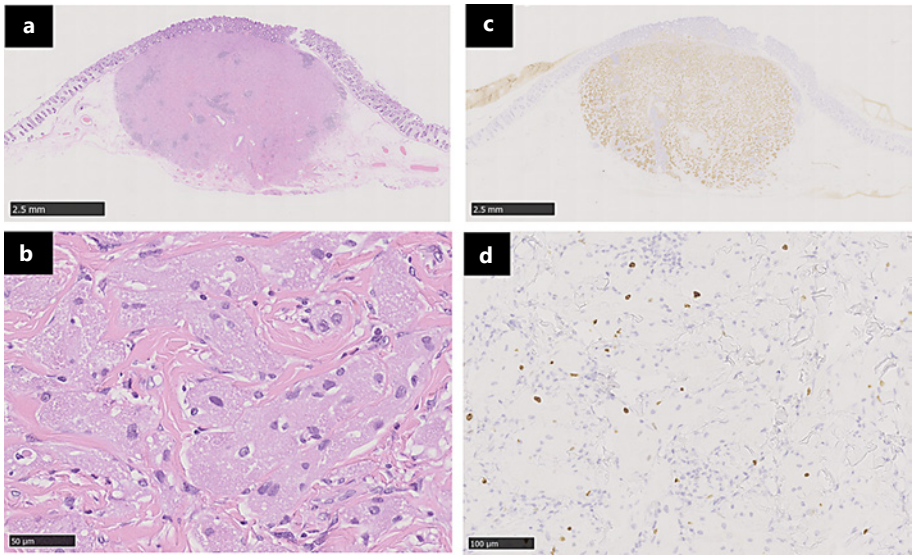

Fig. 3. Histological findings of the resected specimens. **a** The lesion is 8 × 7 mm. It is located in the submucosa, and the surface is covered with non-neoplastic mucosa. **b** Atypical cells with round-to-oval nuclei and acidophilic vesicles are observed (HE staining. ×400 magnification). **c** Immunohistochemistry reveals strong expression of S-100 protein in the lesion. **d** Low expression of Ki-67 labeling (×200 magnification).

ESD is safe for colonic GCT [5]. However, there is no report of a colonic GCT with insufficient endoscopic manipulation until now.

In this case, neuroendocrine tumor and gastrointestinal stromal tumor were also considered as differential diagnoses for colonic SET by EUS, but GCT was considered by HE staining from

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a biopsy sample. However, it is difficult to make a conclusive diagnosis due to the small amount of a biopsied specimen. According to previous reports, EUS-guided fine-needle biopsy (EUS-FNA) is reported to effective for diagnosing SETs in the proximal colon [6]. However, EUS-FNA for the lesion in the proximal colon is challenging because it is very difficult for the EUS scope to reach the proximal colon. Also in this case, the scope manipulation is insufficient and difficult to perform EUS-FNA.

GCTs are typically detected incidentally during screening colonoscopy as solitary nodules measuring less than 2 cm. Colorectal GCTs may be located anywhere from the rectum to the cecum, with a preferential localization to the ascending colon and cecum [5]. The sex and age distribution of GCTs remains controversial due to the small number of colorectal GCT cases. Most GCTs are considered low-grade malignant, but <2% exhibited malignancy potential [2, 7, 8]. However, a case of local recurrence due to incomplete resection was also reported [8], and Parfitt et al. [9] reported that postoperative perforation resulted and urgent hemicolectomy and ileostomy construction were required after polypectomy for a 10 mm GCT in the cecum. ESD facilitates en bloc resection of epithelial tumors, along with the superficial submucosal layer, regardless of tumor size. Therefore, we treated this SET with insufficient endoscopic manipulation in the HF of the colon by ESD technique using assistant devices.

ESD for colonic lesions is reportedly associated with a high risk of perforation. In the present case, the scope manipulation was insufficient. Therefore, the risk of perforation by endoscopic treatment was concerned. However, this lesion was safely treated via ESD due to adequate stability provided by the single-use splinting tube with an inflated balloon and clear visualization of the submucosa using the spring S-O clip traction method. The use of the tube with an inflated balloon facilitates the scope manipulation for colonic ESD [10]. Several traction systems, such as sinker-assisted ESD [11], clip with line-assisted ESD [12], clip-flap method [13], cross-counter traction [14], and spring S-O clip-assisted ESD [15], have been used to facilitate ESD to improve the visibility of the submucosal layer. Sinker-assisted ESD and cross-counter taction methods require special devices, with the former sometimes requiring changing the position of the patient to use gravity. Clip-flap is simple and helpful for creating a mucosal flap; however, this method does not provide constant sufficient traction. Clip with line-assisted ESD is sometimes painful for a patient because it requires the withdrawal and reinsertion of the endoscope. Furthermore, for a rectal lesion, this method could adjust the degree of traction by pulling force, but in our case, sufficient traction could not be obtained due to the interference between the line and the tube. On the other hand, the spring S-O clip-assisted method requires a small device but can maintain constant traction without interference with the tube. Furthermore, this method is less painful for the patient because it does not necessitate withdrawal and reinsertion of the endoscope. In our case, we treated the lesion with insufficient endoscopic manipulation by ESD using the splinting tube and the spring S-O clip traction.

Although most GCTs are pathologically low-grade malignant, surgery is indicated when a biopsy or other examinations suggest the presence of malignancy. Palazzo et al. [3] reported that endoscopic biopsy enabled accurate GCT diagnosis in only 50% of patients. Therefore, en bloc resection by ESD is important to obtain an accurate pathological diagnosis and determine the necessity of additional surgery. In our case, the lesion was completely resected, and the Ki-67 labeling index was 5%, and no risk factors were noted. Based on these findings, we suggest that a low risk of recurrence is associated with ESD for GCTs in the HF. In conclusion, this report shows the safe endoscopic resection for GCT with insufficient endoscopic manipulation in the HF of the colon using a splinting tube and the spring S-O clip traction method.

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Statement of Ethics

All procedures have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The case report was approved by the hospital Ethics Committee of Fukushima Medical University, and written informed consent was obtained from the patient for publication of this case report and images.

Conflict of Interest Statement

The authors have no conflict of interest to declare.

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Author Contributions

Treatment: Kazumasa Kawashima, Yutaro Takeda, Tomoaki Mochimaru, Yuto Ishizaki, Mai Murakami, and Reiko Kobayashi. Pathological diagnosis: Osamu Suzuki and Yuko Hashimoto. Source: Naohiko Gunji, Michio Onizawa, and Yasuo Shioya. Writing-original draft preparation: Kazumasa Kawashima. Review and editing: Takuto Hikichi and Masao Kobayakawa. Supervision: Hiromasa Ohira.

Data Availability Statement

All data generated or analyzed during this study are included in this case report. Further enquiries can be directed to the corresponding author.

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