Solitary schwannoma of the ascending colon

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Schwannomas are uncommon neoplasms arising from Schwann cells of the neural sheath [1-3]. Although benign, schwannomas may recur locally [1-3], and malignant transformation is occasionally observed [1]. Therefore, radical surgery is accepted as a standard treatment [1]. The incidence of submucosal schwannomas is 2% to 6% in all submucosal tumors of the intestine [4]. The stomach is the most frequent site of primary gastrointestinal schwannoma [4]. Accurate diagnosis prior to surgical resection can aid in therapeutic planning. Endoscopic biopsy with immunohistochemistry (IHC) is a reliable method for accurate preoperative assessment.

We report on a patient with schwannoma of the ascending colon detected by colonoscopy and confirmed by IHC, which was removed by endoscopic submucosal dissection. However, additional surgical resection was required because of a positive resection margin. Therefore, laparoscopic ileocolectomy was performed.

Keywords: Schwannoma; Ascending colon; Endoscopic submucosal dissection

INTRODUCTION

Schwannomas are benign tumors derived from Schwann cells of the neural sheath [1-3]. Although benign, schwannomas may recur locally [1-3], and malignant transformation is occasionally observed [1]. Therefore, radical surgery is accepted as a standard treatment [1]. The incidence of submucosal schwannoma is 2% to 6% in all submucosal tumors of the intestine [4]. The stomach is the most frequent site of primary gastrointestinal schwannoma [4]. Accurate diagnosis prior to surgical resection can aid in therapeutic planning. Endoscopic biopsy with immunohistochemistry (IHC) is a reliable method for accurate preoperative assessment.

We report on a patient with schwannoma of the ascending colon detected by colonoscopy and confirmed by IHC, which was removed by endoscopic submucosal dissection. However, additional surgical resection was required because of a positive resection margin. Therefore, laparoscopic ileocolectomy was performed. If colon schwannoma is removed endoscopically and pathologically complete resection is confirmed, we expect that endoscopic treatment is curative.

CASE

A 41-year-old man with a complaint of right lower quadrant abdominal pain for 3 days visited our gastrointestinal clinic for further evaluation and management. Physical examination of the patient revealed tenderness in the right lower quadrant. He had no remarkable past medical history, and no family history of neurofibromatosis. The vital signs were all in the normal range and laboratory findings were within normal limits. Abdominopelvic computed tomography (CT) showed a homogeneous-enhanced intra-luminal protruding mass measuring approximately 1.5 cm in the proximal ascending colon (Fig. 1). A polypoid well circumscribed, fungating mass of the ascending colon was discovered on colonoscopy (Fig. 2A). Saline was injected at the base to raise the mass. A snare was placed at the base and the mass was resected using electrosurgical technique (Fig. 2B). A subsequent biopsy showed a hypercellular spindle cell aggregate forming fascicle and a short whorled pattern with no nuclear atypia and no mitosis (Fig. 3A), and the tumor cells were surrounded by lymphoid cuffing (Fig. 3B) in microscopic view of H&E stain. IHC stains were performed to distinguish gastrointestinal stromal tumor (GIST), leiomyoma, schwannoma, and rhabdomyoma. The tumor cells were strongly diffuse positive for S-100 protein (Fig. 3C), but negative for...
smooth muscle actin, desmin, c-kit, and CD34. Therefore, a
diagnosis of this case was compatible with schwannoma ac-
cording to lymphoid cuffing and IHC profiles. The tumor
measured 2.5×1.5 cm in size. Resection margin was positive.
Laparoscopic ileocolectomy was performed for resection of
the residual mass. The patient resumed oral feeding on the
second postoperative day and, after an uneventful stay, was
discharged on the fifth postoperative day.

DISCUSSION

Schwannomas are uncommon neoplasms arising from sch-
wann cells of the neural sheath [4,5]. Although they may de-
velop anywhere in the body, these tumors are frequently found
in the head and neck, spinal cord, and extremities [4,5]. How-
ever, gastrointestinal sites are rare, accounting for 1% of all
malignant gastrointestinal tumors [6]. There is no difference
in the incidence rates between men and women [6]. The me-
dian age of presentation is 65 years of age [6]. Neurogenic
tumors usually grow very slowly with vague and nonspecific
symptoms, making preoperative diagnosis very difficult [4,5].
Depending on tumor size and location, schwannomas of the
colon may occasionally produce symptoms, such as constipa-
tion, bleeding, abdominal pain or discomfort, and anal pain [4,5].

For the diagnosis of schwannoma, colonoscopy, abdominal
ultrasound, abdominal CT, and abdominal magnetic reso-
nance imaging are useful in determining tumor localization
and their relationship with surrounding organs as well as tu-
mor multiplicity or metastasis [7]. However, benign schwan-
noma cannot be distinguished from malignant stromal tumors
using radiologic images alone. Immunohistological studies
with routine histology play a key role in differentiating sch-
wannoma from other stromal tumors with high potential of
malignancy [4,6]. Gastrointestinal schwannoma are composed
of spindle cells that are 100% immunoreactive for S-100 pro-
tein [7,8]. Cells of neurofibroma show less S-100 positivity
(30-40%), whereas GISTs are generally positive for CD117
c-kit) and CD34 (70%) but negative for S-100 protein [7,8].

Fig. 1. (A) Coronal images of abdominopelvic computed tomo-
graphy scans showing a suspicious 15 mm sized homogeneous
intraluminally protruding mass in the proximal ascending colon
(arrow). (B) Axial images of abdominopelvic computed tomogra-
phy scans showing a suspicious 15 mm sized homogeneous intra-
luminally protruding mass in the proximal ascending colon (arrow).

Fig. 2. (A) Colonoscopic finding showing a pedunculated polypoi-
dlesion measuring 2.5×1.5 cm in size on the ascending colon.
Smooth surface without erosion or ulceration was seen. (B) The
endoscopically resected tumor with yellowish and ovoid feature.

Fig. 3. (A) Microscopic findings showing that the mass is composed of a hypercellular spindle cell aggregate forming fascicle and
a short whorled pattern with no nuclear atypia and no mitosis (H&E stain, ×200). (B) The finding showing that the mass is surrounded
by a lymphoid cuff (H&E stain, ×200). (C) The tumor showing strong immunoreactivity to S-100 protein.
Leiomyomas do not express S-100 protein, expressing smooth muscle actin and desmin instead [7,8].

Complete surgical resection is the treatment of choice [6]. Due to its low incidence, the optimal treatment for a malignant schwannoma has not been fully established [6,9]. Like other soft tissue sarcomas, only a complete surgical resection can provide a chance for cure. The role of radiotherapy or chemotherapy remains unclear [6,9]. Lymph node resection is not recommended because the risk of malignant change is low [10].

The prognosis for schwannoma differs from that of other GISTs, thus, a correct diagnosis is critical. Although schwannomas are usually considered benign, local recurrence could occur if excision is incomplete [6,8,11]. In rare instances, they are capable of malignant transformation [6,8]. The surgical margin has been regarded as the most important prognostic factor [6,9]. Therefore, every effort should be made to achieve a tumor-free surgical margin without unnecessary sacrifice of nerves [6,9].

In this case we detected localized colon schwannoma by colonoscopy, and endoscopic submucosal dissection was attempted. However, resection margin was positive, therefore, laparoscopic ileocolonectomy was performed.

Compared with the other cases of localized colon schwannoma, endoscopic dissection of solitary colon schwannoma was attempted in our class. However, additional surgical resection was required because of a positive resection margin. If the vertical margin could be saved, we can expect endoscopic removal to be a good treatment option. Two cases of cecal schwannoma removed by endoscopic mucosal section were reported [12]. In that case report, no local recurrence was reported. If accumulation occurs as in our case, a minimally invasive procedure such as endoscopic submucosal dissection is expected for curative treatment of benign schwannoma of colon and rectum.

REFERENCES