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 ileocolic resection 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 according to lymphoid cuffing and IHC profiles. The tumor measured 2.5×1.5 cm in size. Resection margin was positive. Laparoscopic ileocolonectomy 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 schwann cells of the neural sheath [4,5]. Although they may develop anywhere in the body, these tumors are frequently found in the head and neck, spinal cord, and extremities [4,5]. However, 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 median 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 constipation, bleeding, abdominal pain or discomfort, and anal pain [4,5].

For the diagnosis of schwannoma, colonoscopy, abdominal ultrasound, abdominal CT, and abdominal magnetic resonance imaging are useful in determining tumor localization and their relationship with surrounding organs as well as tumor multiplicity or metastasis [7]. However, benign schwannoma cannot be distinguished from malignant stromal tumors using radiologic images alone. Immunohistological studies with routine histology play a key role in differentiating schwannoma 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 protein [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].
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 ileocolectomy 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