



Case report

Laparoscopic treatment of a series of rare tumors, gastric schwannoma with chronic iron deficiency anemia: A case report

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ABSTRACT

Introduction and importance: Gastric schwannoma is a rare and slow-growing gastrointestinal mesenchymal tumor. Gastric neurilemmoma accounts for less than 1% of all gastric tumors. Without specific clinical manifestations, it is easy to be misdiagnosed before the operation, and rupture and bleeding will lead to persistent anemia in patients. The diagnosis can only be confirmed by pathological examination.

Case presentation: A 55-year-old woman was admitted to The Second Hospital of Lanzhou University due to abdominal distension, pain, acid regurgitation, and belching. The tumor was completely removed by laparoscopy. The postoperative specimens were diagnosed as gastric neurilemmoma by pathological examination.

Clinical discussion: Schwannoma is a benign neurogenic tumor. Complete surgical resection with a negative cutting edge is an effective method for the treatment of gastric schwannoma. Because the lesion is benign, the prognosis of the patient is good.

Conclusion: Laparoscopic tumor resection is a choice for the treatment of gastric schwannoma, and the therapeutic effect is good.

1. Introduction

Gastrointestinal schwannomas are rare mesenchymal tumors, firstly reported by Daimaru, who identified a schwannoma as a primary GI tumor entity based on the positive S-100 immunostaining [1]. Gastrointestinal schwannomas are benign, slow-growing, and usually asymptomatic tumors, but in some cases bleeding, epigastric pain, and palpable mass may occur. Preoperative diagnosis is challenging due to the difficulty of differentiation from other submucosal tumors, and consequently, the correct diagnosis is most often provided through the histology report [2]. This case report has been reported in line with the SCARE Criteria [3].

2. Case presentation

A 55-year-old female was admitted to the hospital for half a year because of epigastric pain with acid regurgitation. Within six months before admission, the patient had no obvious cause of abdominal pain, paroxysmal dull pain, acid, belching, and no history of smoking or drug use. Gastroscopy was performed after admission to The Second Hospital

of Lanzhou University: 1. Chronic atrophic gastritis, bile reflux; 2. Protruberant lesion of gastric space; abdominal CT suggested: 1. Gastric space-occupying lesions, gastric stromal tumors are more likely, please combine with clinical; 2. Hepatic cyst; 3. After intrathoracic vertebral body fixation, bilateral sacroiliac arthritis. Blood examination showed that HGB89g/L, FERRITIN, 10.40 ng/mL, B-12170.00 pg/mL, tumor markers were normal. CT scan showed that the size of gastric antrum was about 5 × 4 cm, with high density and uneven enhancement (Fig. 1A, B). Gastroscopy showed that there was a dish-shaped organism in the lower part of the bottom ventricle, the size was about 5 × 3.0 cm, and the surface of the tumor was smooth. (Fig. 2A, B). The operation was performed laparoscopically by Dr. Zhou of General Surgery on July 5, 2021. The size of the tumor is about 5-4.5-3 cm. Ulcers can be seen on the surface of the tumor. The tumor is grayish-white and slightly tough. Postoperative pathology: pathological examination showed spindle cell tumor in the lower part of the gastric body, combined with immunohistochemistry: DOG1 (-), CD117 (-), GFAP (-), S100 (+) (Fig. 3A, B), CD34 (-), SMA (-), vimentin (+), CKp (-), Bcl2 (-), caldesmon (-), Desmin (-), TLEI (+), STAT6 (-), Ki67 (8%). (Fig. 4A, B). It is consistent with schwannoma. The patient was discharged 7 days after the

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Fig. 1. CT image of gastric schwannoma.

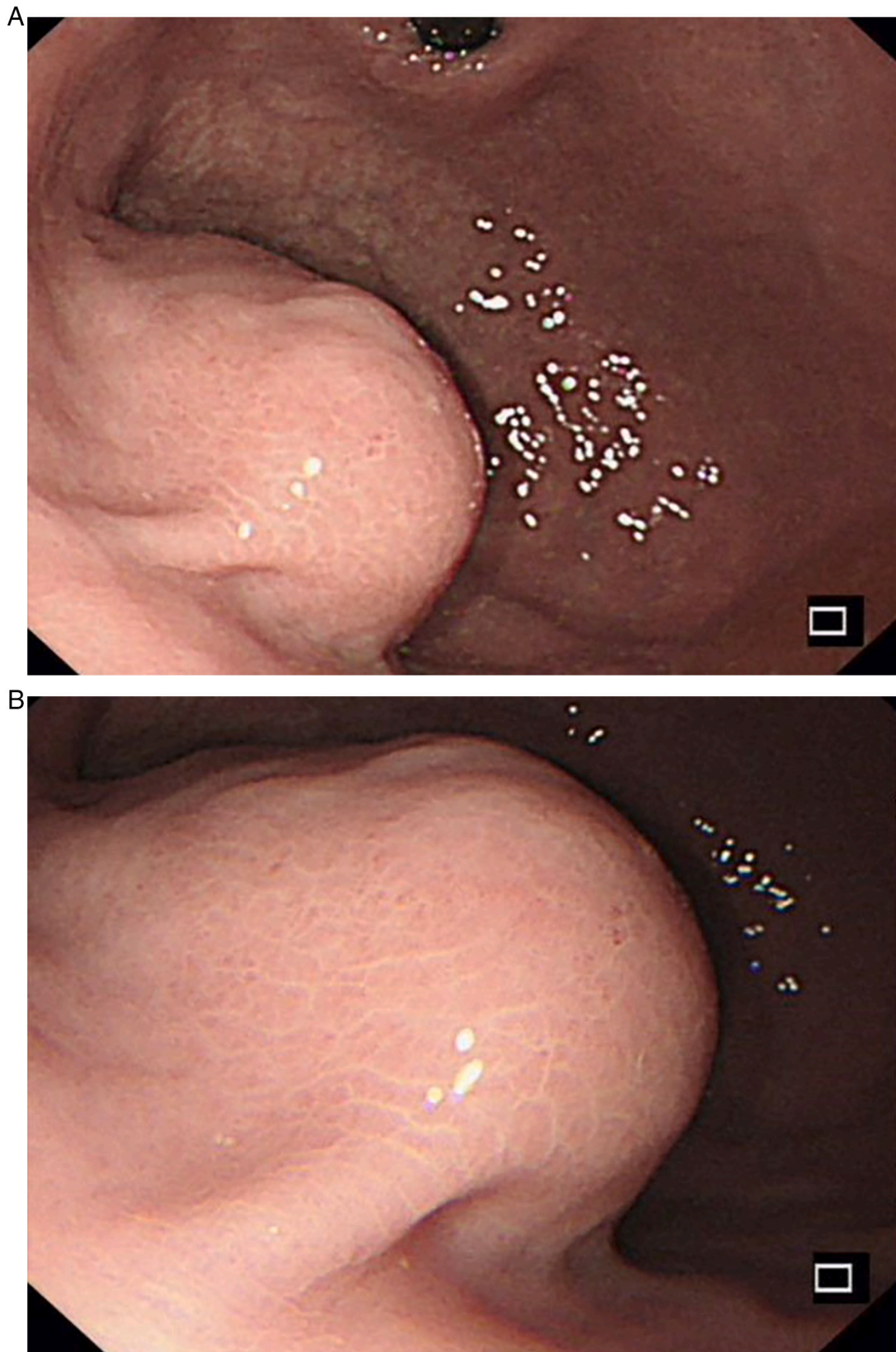


Fig. 2. Gastroscope image of gastric schwannoma.

operation. The patient's feedback recovered well and agreed with our case report.

3. Discussion

In gastroscopy performed in adults, a gastric subepithelial tumor is found in approximately 1 in 300 gastroscopies. They appear as

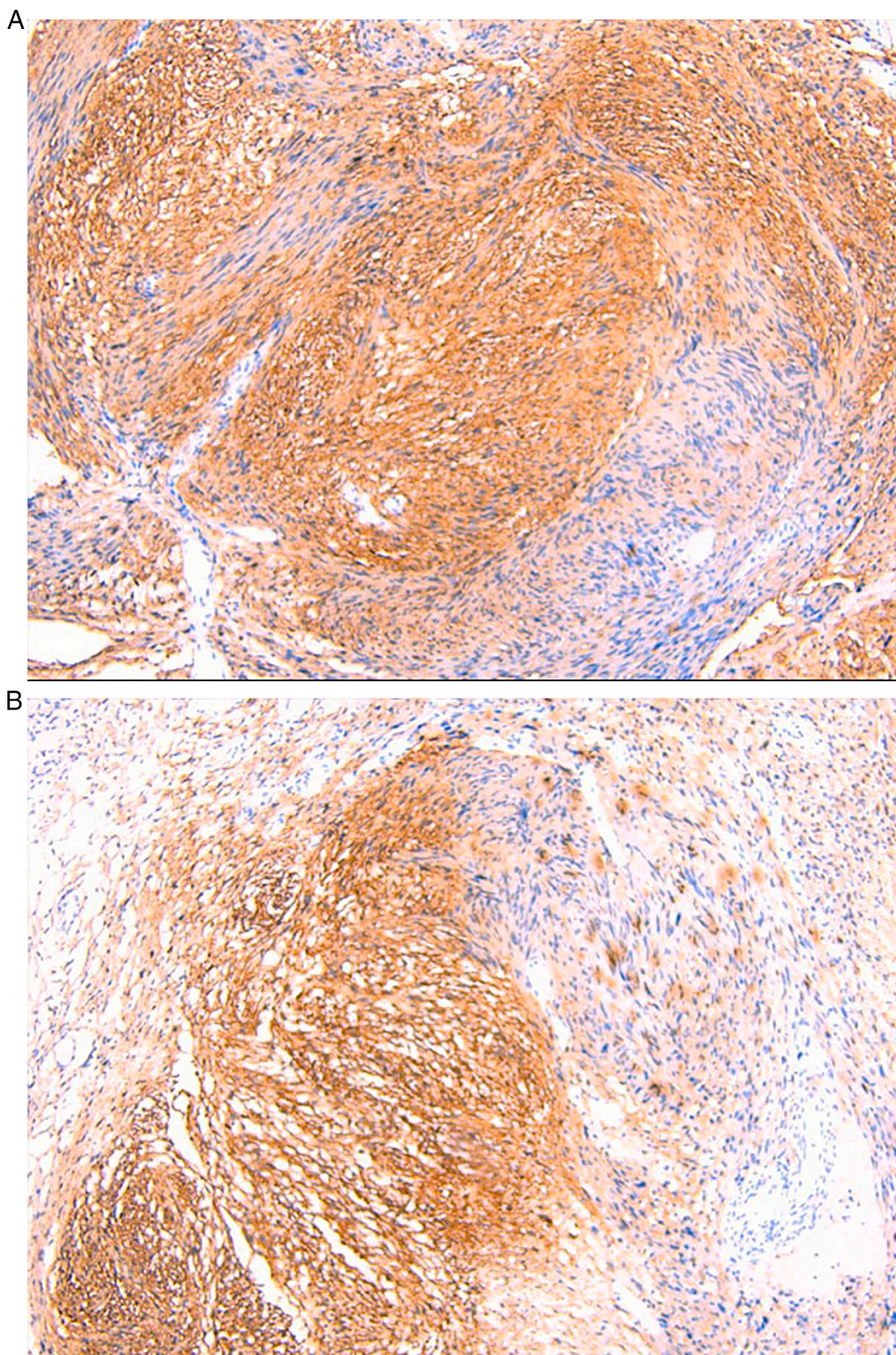


Fig. 3. Image of S100 immunochemical staining about postoperative gastric schwannoma tissue.

protrusions on the inner surface of the gastric cavity covered by the normal epithelium. These lesions may be caused by gastric wall tumors or exogenous compression. The tumors are classified into non-neoplastic and neoplastic. Non-neoplastic lesions include inflammatory lesions,

cysts, and heterotopic pancreas. The most important neoplastic lesions are mesenchymal tumors and lymphomas. Mesenchymal tumors mainly include gastrointestinal stromal tumors, myogenic tumors (such as leiomyoma and leiomyosarcoma), neurogenic tumors (including

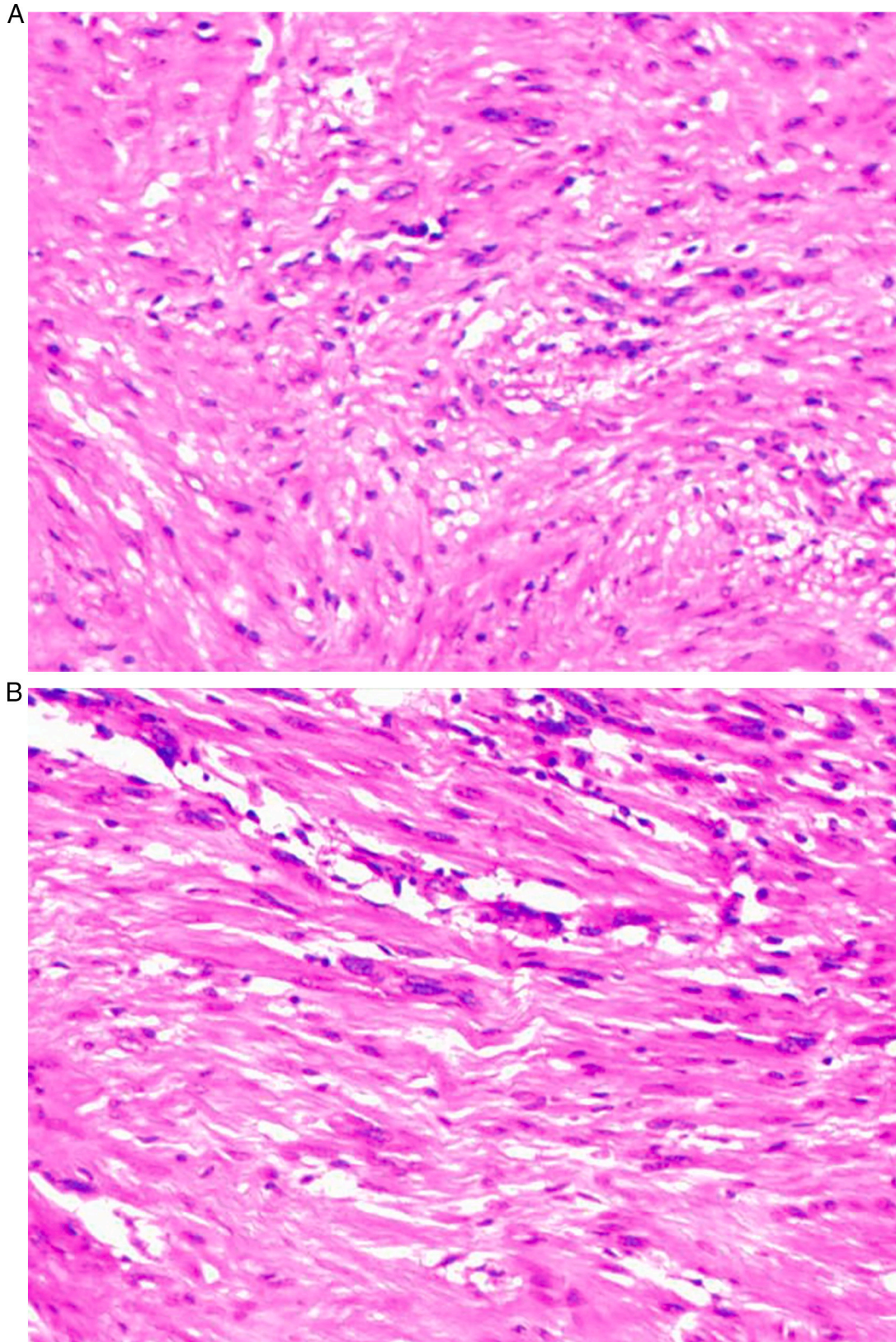


Fig. 4. Image of hematoxylin-eosin staining about postoperative gastric schwannoma tissue.

schwannomas and neurofibromas), and vascular tumors. This article reports a case of schwannoma. Schwannomas are benign neurogenic tumors, originating from Schwann cells, which normally wrap around the axons of the peripheral nerves. They can develop anywhere along the peripheral course of the nerve. Schwannomas have a predilection for the head, neck, and flexures or surfaces of the limbs, but they have rarely been reported in the GI tract and have occurred predominantly in the stomach. It is reported that gastric schwannomas account only for 0.2% of all gastric tumors, and principally involve the submucosa and muscular propria [4]. They grow slowly and exogenous.

Among gastrointestinal stromal tumors, gastrointestinal stromal tumors (GIST) are the largest mesenchymal tumors, while schwannomas are rare and more common in the elderly (average age 58 years). Shows slight female preference [5]. Our case is consistent with the law discovered by previous people, and it was found in a 55-year-old female patient.

They are often asymptomatic and can be discovered incidentally at laparotomy or radiographically. If symptomatic, the most common presenting symptom is upper GI bleeding, which may be secondary to the growing submucosal mass compromising the blood supply to the overlying mucosa. In some cases, epigastric pain, as in our case, or a palpable mass may occur. Sometimes acid reflux symptoms also occur, as described by Sreenath Meegada [6]. Owing to the rarity of gastric schwannomas, there is limited data about the imaging features of this neoplasm. As diagnostic modalities for gastric schwannomas, endoscopy, CT, and, recently, positron emission tomography (PET) have been proposed. On endoscopy, gastric schwannomas appeared as elevated submucosal masses, and a central ulcer was seen in 25–50%. Endoscopic biopsies, when performed, may not be adequate for a definite diagnosis, because gastric schwannomas are mainly located in the submucosal layers and mucosal abnormality may be minimal. Like the case was reported, the endoscopic biopsy revealed only chronic inflammation without any malignant cells. EUS-fine needle aspiration biopsy is currently considered the standard method for samples of submucosal tumors, and the diagnostic yield was 43.3%. Although most gastric schwannomas are benign, the differential diagnosis is a gastric stromal tumor (GIST). Because the typical submucosal tumors show spindle cell histology, gastric schwannoma is roughly similar to GIST. In the diagnosis of such submucosal tumors, the biopsy may lead to false-negative results and is therefore invalid. On the other hand, Endoscopic Ultrasound Fine Needle Aspiration (EUS-FNA) may help diagnosis. However, there is no consensus on the accuracy rate; in addition, according to the guidelines of the National Comprehensive Cancer Network (NCCN), it is not recommended to use conventional EUS-FNA for initial resectable GIST [7]. On CT examination, gastric schwannomas show homogeneous attenuation and enhancement, which was consistent with our case. Degenerative changes are uncommon.

Complete resection with negative surgical margins is an effective way to treat gastric schwannoma, just like gastrointestinal stromal tumors or other submucosal tumors. In recent years, laparoscopic and endoscopic collaborative surgery (LECS) has been increasingly applied to gastric submucosal tumors [8]. The possibility of malignancy cannot be ruled out in our case, because a case of a malignant tumor with a diameter of more than 50 mm has been reported [9]. To prevent the gastric tumor from rupturing, we removed the gastric tumor from the abdominal cavity under the guidance of a laparoscope. Taking into account the medical expenses, the minimal invasiveness and safety of the patient, and the oncology aspect, the treatment we choose is beneficial enough for gastric schwannoma over 50 mm and has no adverse effect on the patient. GS is a benign tumor that will not recur regardless of its size [10]. Nevertheless, we believe that regular follow-up of gastric schwannoma is necessary because of such a report of a malignant case.

4. Conclusion

Schwannomas most commonly occur in the head and neck, but rarely

in the nerve plexus of the gastrointestinal wall. The stomach is the most common site, followed by the colon. Due to the difference from other submucosal tumors, preoperative diagnosis is challenging. The most common symptoms are abdominal pain or discomfort, followed by upper gastrointestinal bleeding. CT, MRI, and EUS of the upper gastrointestinal tract usually have no specific findings, and the final pathological report confirms the definite diagnosis of gastrointestinal tumors. Complete resection with negative surgical margins is the treatment option. Laparoscopic and endoscopic collaborative surgery is also increasingly used in the treatment of gastric schwannoma. This method of treatment means that the differential diagnosis of these tumors is usually performed after surgery. This diagnosis is based on immunohistochemical examination of surgical sections. Neurinoma S-100 is positive, CD117, CD34, SMA and desmin negative. It is very important to make this diagnosis correctly because they are tumors with very low malignant potential compared to GIST, and resection margins are curable.

Ethics approval and consent to participate

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Ethical approval

The authors have no ethical conflicts to disclose.

Consent

The consent of the patient has been obtained. Except for the relevant medical history data, the personal privacy information of the patient is not involved in this paper.

Author contribution

Study concept or design, data collection: Xinyuan Zhou
Data analysis or interpretation, writing the paper: Ni Lu
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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] Y. Daimaru, H. Kido, H. Hashimoto, M. Enjoji, Benign schwannoma of the gastrointestinal tract: a clinicopathologic and immunohistochemical study, *Hum. Pathol.* 19 (1988) 257–264, [https://doi.org/10.1016/s0046-8177\(88\)80518-5](https://doi.org/10.1016/s0046-8177(88)80518-5).

- [2] F. Tatangelo, et al., Gastric schwannoma misdiagnosed as GIST: a case report with immunohistochemical and molecular study, *Oncol. Lett.* 11 (2016) 2497–2501, <https://doi.org/10.3892/ol.2016.4281>.
- [3] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg. (Lond. Engl.)* 84 (2020) 226–230, <https://doi.org/10.1016/j.ijsu.2020.10.034>.
- [4] L. Zheng, et al., Clinicopathological and immunohistochemical characterisation of gastric schwannomas in 29 cases, *Gastroenterol. Res. Pract.* 2014 (2014), 202960, <https://doi.org/10.1155/2014/202960>.
- [5] H. Joensuu, P. Hohenberger, C.L. Corless, Gastrointestinal stromal tumour, *Lancet (Lond. Engl.)* 382 (2013) 973–983, [https://doi.org/10.1016/s0140-6736\(13\)60106-3](https://doi.org/10.1016/s0140-6736(13)60106-3).
- [6] A. Albshesh, M.I. Kaufmann, I. Levy, Gastric schwannoma, *Clin. Gastroenterol. Hepatol.* 18 (2020) e142–e143, <https://doi.org/10.1016/j.cgh.2019.08.027>.
- [7] S. Yanagawa, et al., A rare case of gastric schwannoma: A case report and literature review, *Case Rep. Oncol.* 13 (2020) 330–335, <https://doi.org/10.1159/000506450>.
- [8] K. Niimi, et al., Laparoscopic and endoscopic cooperative surgery for gastrointestinal tumor 5 (2017) 187, <https://doi.org/10.21037/atm.2017.03.35>.
- [9] M. Takemura, K. Yoshida, M. Takii, K. Sakurai, A. Kanazawa, Gastric malignant schwannoma presenting with upper gastrointestinal bleeding: a case report, *J. Med. Case Rep.* 6 (2012) 37, <https://doi.org/10.1186/1752-1947-6-37>.
- [10] X. Hong, W. Wu, M. Wang, Q. Liao, Y. Zhao, Benign gastric schwannoma: how long should we follow up to monitor the recurrence? A case report and comprehensive review of literature of 137 cases, *Int. Surg.* 100 (2015) 744–747, <https://doi.org/10.9738/intsurg-d-14-00106.1>.