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CASE REPORT | ENDOSCOPY

Endoscopic Management of Ganglioneuroma in the Stomach

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ABSTRACT

Ganglioneuromas are rare benign tumors of neuroblastic origin that can occur anywhere along the sympathetic chain. They are rarely found in the gastrointestinal tract and can appear as solitary polypoid lesions or diffuse as part of a familial syndrome. They are often asymptomatic but may present with nonspecific symptoms depending on their anatomic location. They have no special endoscopic appearance and are diagnosed by histology and immunohistochemistry staining. We present a case of solitary gastric ganglioneuroma treated successfully with endoscopic resection.

INTRODUCTION

Ganglioneuromas (GN) are rare benign neoplasms of neuroblastic origin comprising ganglion cells, peripheral nerve, and supporting cell elements.[1–3] They can be found anywhere but are mainly seen in the posterior mediastinum (60%–80%) or the abdominal cavity (10%–15%).[2–4] Within the abdominal cavity, they often localize to the retroperitoneal space or in the adrenal glands.[2] They can also be seen in the cervical region (5%) but are rarely discovered in the gastrointestinal tract.[3] Ganglioneuromas appear as solitary or multiple lesions and can be isolated or associated with familial syndromes.[4–7] We present a case of isolated ganglioneuroma incidentally found in the stomach and treated with endoscopic resection in a patient who was evaluated for dysphagia.

CASE REPORT

A 50-year-old man from Russia was referred to our hepatology clinic by his primary care physician after he was found to have chronic hepatitis B and D coinfection. He had no other significant medical history. Physical examination revealed a well-appearing man without jaundice. His abdomen was soft and nondistended. He underwent an ultrasound of the liver with findings suggestive of liver cirrhosis. Transient elastography demonstrated a fibrosis stage of 4 consistent with cirrhosis. A screening esophagogastroduodenoscopy (EGD) showed 2 columns of small esophageal varices. Interestingly, a small submucosal nodule was seen in the stomach but was not biopsied. He returned to our clinic 1 year later complaining of an onset of dysphagia intermittent to solids which worsened over the past 3 months. His weight was otherwise stable. On presentation, vital signs and physical examination were normal. He agreed to an EGD and endoscopic ultrasound. Upper endoscopy was significant for a submucosal polyp with central erosion, measuring 1.2 × 0.7 × 0.5 cm, in the distal body/proximal antrum (Figure 1). Endoscopic ultrasound showed a submucosal nodule of mixed echogenicity with prominent mucosal irregularity that extended into the submucosa (Figure 2). The base of the nodule was injected with Eleview (SIC-8000; Aries Pharmaceuticals, La Jolla, CA). Using AcuSnare Polypectomy (1.5 × 3 cm; Cook Medical, Bloomington, IN) and Olympus electrosurgical unit at setting of ForcedCoag2, 20-Watt, hot snare resection was performed and the lesion was resected en bloc. Two hemoclips were placed to approximate the mucosal defect. Hot snare resection was chosen because the size of the lesion was greater than 1 cm, and gastric polyps are generally hypervascular. Histology showed proliferation of spindle and ganglion cells in the lamina propria (Figure 3). Immunohistochemistry revealed strong staining for S100, SOX10, and neurofilaments (Figure 4). These features were all consistent with the diagnosis of polypoid ganglioneuroma. The patient tolerated the procedure without any complications and returned to our clinic 6 months later without additional symptoms.

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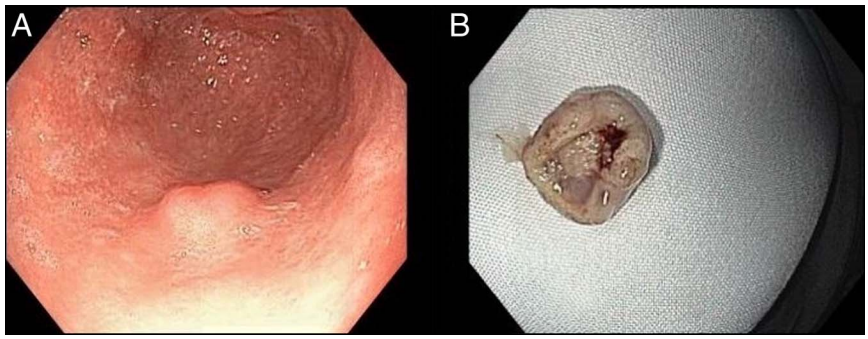

Figure 1. (A) A submucosal nodule seen in the stomach and (B) gross pathology of the well-circumscribed firm tumor.

DISCUSSION

Ganglioneuromas are benign neoplasms that arise from embryonic neural crest cells.[1–5] The reported incidence of GN are 1 per million in the general population.[1–3] They occur in all age groups but are more common in children and have no sex predilection. The pathogenesis of GN is unknown.[1,8] They can develop anywhere along the sympathetic chain but are commonly seen in the posterior mediastinum, retroperitoneum, and adrenal gland.[3] Gastrointestinal GN are even rarer, and if they occur, they are mostly concentrated in the large bowel.[7,9–11] There have been reports of GN in the appendix, small intestine, and terminal ileum.[4,6–10]

Ganglioneuromas of the gastrointestinal tract can be grouped into 3 different categories based on their morphological presentation: polypoid, ganglioneuromatosis polyposis, and diffuse ganglioneuromatosis.[8–10] Polypoid GNs can be solitary or a few in number.[5–7] Diffuse or disseminated GN are often associated with syndromes such as neurofibromatosis type 1 or multiple endocrine neoplasia type 2B.[9–13] Patients with isolated GN are often asymptomatic, and tumors are incidentally identified when looking for secondary causes. Diffuse or disseminated forms present in the GI tract may cause acute intestinal obstruction or may also be found incidentally during investigations for other pathologies.[6–10]

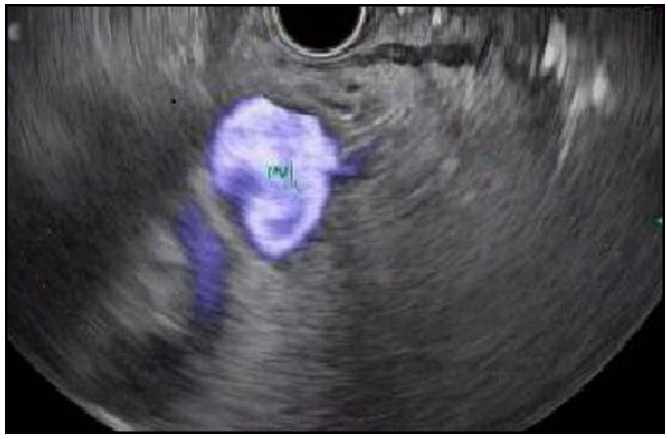

Figure 2. A mixed echogenic polypoid tumor can be seen extending into the submucosa.

As these tumors are clinically silent, functionally active GN may be detected earlier because they often secrete catecholamines.[8] Affected individuals may present with labile hypertension, diarrhea, tremors, headaches, diaphoresis, or palpitations.[8] The proportion of patients with GN that secrete catecholamine is currently unknown. Our patient did not have a personal history of hypertension and did not exhibit any of the abovementioned signs or symptoms. Laboratory testing to detect serum or urinary catecholamine or their metabolites in addition to functional imaging such as computed tomography scan, magnetic resonance imaging, and I23I- or 1311-labeled metaiodobenzylguanidine scintigraphy may be helpful for the assessment and localization of the tumor. However, histopathology remains the gold standard for the diagnosis of GN and immunohistochemistry is used to aid in the diagnosis because neither signs and symptoms or imaging studies are reliable in differentiating this tumor from other neural crest-derived tumors such as neuroblastoma or pheochromocytoma.[8]

Ganglioneuromas have no typical endoscopic appearance, and in our case, the tumor was seen as a submucosal nodule.[5–7] These tumors occupy the lamina propria and may extend into the submucosa. The lamina propria expands by proliferation of S100 positive spindle cells with wavy nuclei surrounded by ganglion cells. Immunohistochemistry shows strong staining of ganglion cells for neurofilaments, chromogranin A, and glial fibrillary acidic protein and Schwann cells for S100.[7–13] The differential diagnosis for this tumor is neurofibroma (NF) because they are microscopically similar and are commonly seen in the stomach.[4] Both NF and GN stain positively for S100 and neurofilament, but only NF stain strongly positive for CD34, calretinin, and SOX10. The presence of ganglion cells, confirmed by staining, sets GN apart from other neurogenic spindle cell tumors such as NF.[4,13] There is no consensus on the optimal management strategy of GN owing to their rarity and benign nature.[5,13] Nonetheless, malignant transformation of GN into neuroblastoma, albeit rare, has been reported in the literature. Hence, resection is often recommended.[14] When they are found in the gastrointestinal tract, endoscopic polypectomy is generally curative for the polypoid subgroups. However, care must be

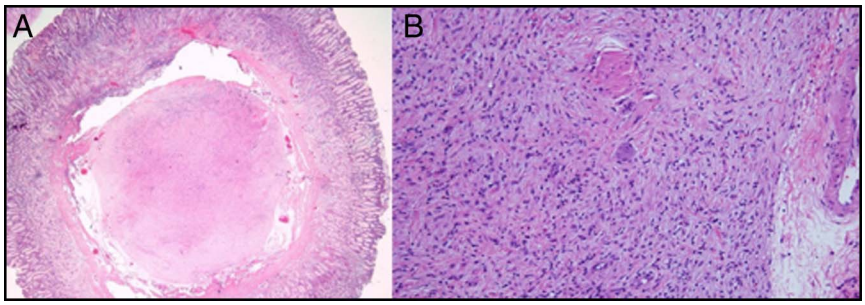

Figure 3. Histopathological slide showing (A) ganglioneuroma associated with submucosa of the stomach, a well-circumscribed tumor composed of fascicles of spindled Schwann cells with interspersed ganglion cells (2× magnification) and (B) spindle cells with wavy nuclei interspersed with ganglion cells (20× magnification).

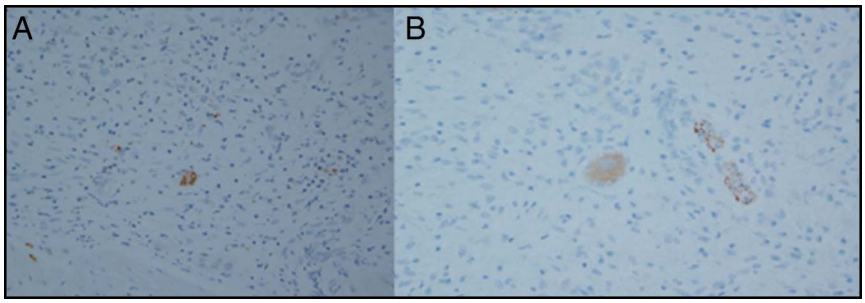

Figure 4. Immunohistopathological slides showing (A) spindle cells with patchy immunoreactivity for S100 (40× magnification) and (B) the ganglion cells stained positive for neurofilament (100× magnification).

taken to ensure that the tumor itself is not adherent to the surrounding nerves, vessels, or other important structures.[5] Endoscopic follow-up is generally recommended to screen for recurrence, although some authors believe that this screening is unnecessary because of their benign nature.[3–7]

DISCLOSURES

Author contributions: S. Ghoneim, A. Shah, and D. Sandhu wrote, edited, and approved the final version. S. Ghoneim, A. Shah, K. Han, and D. Sandhu revised the manuscript for intellectual content. S. Ghoneim is the article guarantor.

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