

Endoscopic submucosal dissection for the diagnosis and treatment of a gastric submucosal tumor: initial experience in Greece

Periklis Apostolopoulos, Antonios Zalonis, Athanasios Karamoutzos, Panagiota Mavrogiannis, Erasmia Vlachou, Panagiotis Tsibouris, Georgios Alexandrakis

NIMTS Army Veterans Hospital, Athens, Greece

Abstract

Gastric submucosal tumors (GSMTs) are frequently found incidentally on routine upper endoscopy. Definitive diagnosis based on histological confirmation is relatively difficult. Even without accurate diagnosis before treatment, open or laparoscopic surgery is considered the standard of care for most GSMTs. Alternatively, endoscopic resection of GSMTs using different techniques has been reported in a limited number of papers. We describe a case of an antral submucosal tumor, more specifically a leiomyoma of muscularis mucosa origin, in a 78-year-old woman, that was completely resected *en bloc* using an endoscopic submucosal technique with a TT-knife. It is suggested that ESD is a feasible option for the diagnosis and treatment of GSTMs.

Keywords endoscopic submucosal dissection, gastric tumors, leiomyoma, subepithelial lesions, submucosal tumors

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Introduction

Submucosal tumors (SMTs) are frequently found during endoscopy performed for screening purposes or unrelated indications. Differentiation between benign and malignant lesions is of great clinical importance, since some SMTs have malignant potential. However, definite diagnosis and nonsurgical therapy of SMTs are occasionally difficult. Conventional biopsy specimens obtained during gastroscopy have low diagnostic yield [1] and EUS-FNA, which has emerged as the diagnostic procedure of choice, has a relatively low accuracy rate, in terms of definite diagnosis [2].

Alternatively, endoscopic submucosal dissection (ESD) is being proposed for the *en bloc* resection of tumors of submucosal origin, in order to obtain tissue specimen for accurate diagnosis [3] and definitive treatment [4-6]. We present the case of an antral submucosal tumor, specifically a leiomyoma of muscularis mucosa origin, which was resected *en bloc* using an endoscopic submucosal technique with a triangle-tip electrocautery knife (TT-knife).

Case report

A 78-year-old woman with a history of right heart failure on anticoagulant therapy was referred to our department due to persistent dyspeptic symptoms. Upper gastrointestinal (GI) endoscopy revealed a submucosal lesion, ulcerated on top, measuring approximately 35 mm x 10 mm, on the anterior-inferior wall of the antrum (Fig. 1). Boring biopsies were obtained. Endoscopic ultrasonography revealed a well-circumscribed homogenous, hypoechoic mass 35 mm x 12 mm in size originating from the second gastric wall layer – muscularis mucosa (Fig. 2). Pathologic examination proved insufficient to provide a definitive diagnosis, setting the differential diagnosis among PDGFRA(+) GIST, leiomyoma and leiomyosarcoma. Immunohistochemistry revealed SMA(+), suggestive of a leiomyoma/leiomyosarcoma although desmin(-) and CD34(+), suggestive of GI stromal tumor although CD117(c-kit) (-). Moreover S-100 was negative, excluding tumors of neural origin and Schwannoma. Since the patient was not an eligible surgical candidate due to comorbidities and advanced age, she was referred for ESD after obtaining informed consent.

Midazolam plus propofol were used for sedation under anesthesiological supervision. A triangle-tip electrocautery knife (TT-Knife, KD-640L; Olympus Optical) was used through a standard-size video endoscope (GIF-1T140; Olympus Optical). A soft transparent straight-type cap device (MH595; Olympus Optical) was attached to the tip of the endoscope to obtain proper direct views of the submucosal layer.

Gastroenterology Department, NIMTS Army Veterans Hospital, Athens, Greece

Conflict of Interest: None

Correspondence to: Periklis Apostolopoulos, MD, PhD, PB 155, 19010 Saronikos, Greece, e-mail: periklisapo@yahoo.com

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Figure 1 Upper endoscopic examination revealed a submucosal lesion with a small ulceration on its top on the anterior-inferior wall of the gastric antrum

Resection of the submucosal lesion was performed according to the previously published experience [7,8]. Initially, the demarcation of the marginal dissection line was performed, approximately 5 mm distant from the tumor margin, by applying argon plasma coagulation (35W, 0.8 L/min) using a 2.3 mm diameter probe (APC-Sonde 2200 A; ERBE Elektromedizin GmbH). Complete lift of the lesion was achieved by submucosal injection of a solution of 0.5 mL of epinephrine 0.1% added in 100 mL Glycerol with 1 mL indigo carmine dye. Additional submucosal injections of epinephrine solution were applied to maintain the lift effect, when needed. Exposed blood vessels of the ulcer bed were thoroughly

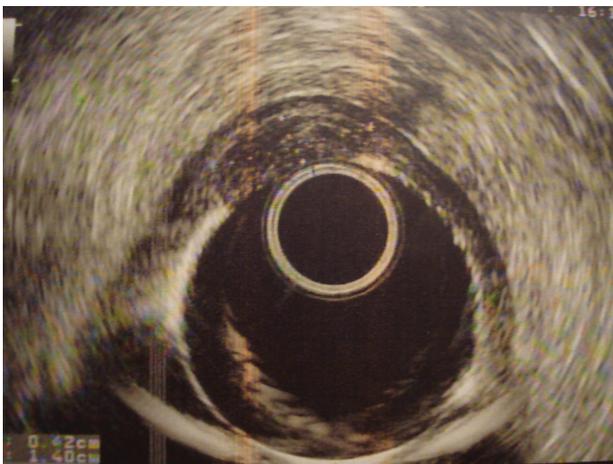


Figure 2 Endoscopic ultrasonography revealed a homogenous, hypoechoic mass originating from the second – muscularis mucosae – gastric wall layer

coagulated either with the bottom of the triangular plate or using hemostatic forceps (Coagrasper, Olympus Optical), to prevent bleeding. Finally, the resection site was carefully observed to evaluate the presence of any residual tumor and sucralfate was sprayed onto the ulcer (Fig. 3A). The duration of the procedure was 55 min, consistent with the published data, while no immediate complications, such as perforation or postoperative bleeding, occurred.

After complete *en bloc* resection, tissue specimen was fixed along its edges using thin needles, inserted onto a wooden plate and fixed in formalin solution. Histopathology examination confirmed complete resection and set the diagnosis of leiomyoma.

Upper GI endoscopy was carried out six days after the procedure in order to evaluate the ulcer bed and to initiate per os anticoagulation therapy (Fig. 3B). Follow-up upper GI endoscopy 3 months later did not reveal any signs of recurrence.

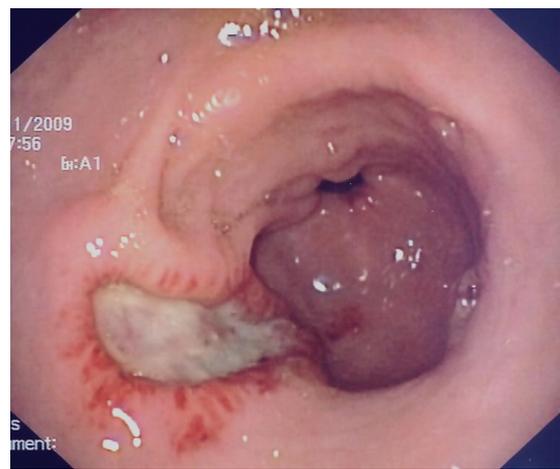


Figure 3 Endoscopic view of the ulcer bed immediately after the procedure (A) and on the sixth day (B), respectively

Discussion

Gastric SMTs (GSMTs) are frequently found incidentally during upper GI endoscopy [1]. They represent a heterogeneous class of tumors with distinct clinicopathological characteristics and different behavior patterns [3]. Endoscopic and EUS appearance are not tumor-specific [1,5] and biopsy specimens obtained at endoscopy by standard methods are usually inadequate for diagnosis [1]. The introduction of EUS-guided fine needle aspiration and EUS-guided TruCut biopsy have rendered the differential diagnosis of SMTs more reliable; however, even these techniques do not always allow a definitive diagnosis and a conclusive decision for further patient management [2].

According to the position of the American Gastrointestinal Association Institute, patients with SMTs <3 cm can be followed by periodic endoscopic or EUS examinations, while lesions >3 cm, in which the malignant potential cannot be determined by less invasive means, require surgical or endoscopic excision for diagnosis [3]. Moreover, according to recent National Comprehensive Cancer Network guidelines, all GI stromal tumors >2 cm should be resected, and the treatment options for incidental tumors <2 cm are either resection or surveillance [9]. In our case, the SMT was of muscularis mucosae origin, 3.5 cm in size according to the EUS findings and it was asymptomatic; however the diagnosis, even after immunohistochemical staining of tissue specimens, was still inconclusive, without excluding a potential malignant tumor, like GIST.

Endoscopic submucosal dissection is a technique initially developed in Japan for the *en bloc* resection of early-stage gastric cancer [10]. The literature on the use of different ESD techniques for the diagnosis and treatment of GSMTs is limited [4,6,8,11-14]. Initial data supported that complete *en bloc* resection using ESD techniques is indicated only for GSMTs originating from the muscularis mucosa and the submucosal gastric layer [4,11], as in our case. However, the use of ESD for the resection of GSMTs arising from the muscularis propria has been described in feasibility studies with a lower complete resection rate around 65% [6,12,13], with no or narrow tumor connection with the underlying muscle layer on EUS being a predictive factor of complete resectability [6].

Nevertheless, endoscopic resection of GSMTs has a number of shortcomings. ESD represents a minimally invasive but technically demanding and time-consuming procedure, with high complication rate, ranging between 0% [4,13] and 20% [14], even in experienced hands. Perforation and bleeding are among the most common complications, with the main predictive risk factor being a tumor originating from the muscularis propria gastric layer [8]. Finally, the acquisition of the technique is difficult, since the patient pool in Western countries seems to be small [15].

In conclusion, we report a case of a GSMT of undetermined histological nature, which has been successfully removed,

using an endoscopic submucosal dissection technique. With the ESD technique the procurement of adequate material for definite diagnosis was achieved, while at the same time the optimal treatment was offered. We therefore consider that ESD, despite its limitations, could be a feasible option for the diagnosis and treatment of GSMTs. To the best of our knowledge, the current report is the first case of ESD reported in Greece.

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