

Gastric Gastrointestinal Stromal Tumor (GIST) Incidentally Found After Laparoscopic Sleeve Gastrectomy: A Case Report

Reza Roshanravan¹; Mina Heidari Esfahani²; Sam Moslemi^{1,*}; Seyed Vahid Hosseini¹; Khairallah Muzhir Gabash³

¹Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran

²Department of Pathology, Shiraz University of Medical Sciences, Shiraz, IR Iran

³Department of Surgery, Al-Karama Teaching Hospital, Medical College, Wasit University, Wasit, Iraq

*Corresponding author: Sam Moslemi, Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel: +98-7112306972, Fax: +98-7116462925, E-mail: moslemis@sums.ac.ir

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Introduction: One of unexpected and incidental pathologic reports in endoscopy is Gastrointestinal Stromal Tumor (GIST) with an incidence of 1.5/100000 annually and incidental pathologic finding during bariatric surgery as around 2% herein.

Case Presentation: We reported a 45-year-old female with morbid obesity for five years scheduled for laparoscopic sleeve gastrectomy. During the operation, no mass was detected and postoperative pathology reported a GIST with positive report of CD117 and negative for S100.

Discussion: Laparoscopic resection of early stage gastric GIST is a useful approach and has become a proper technique in the recent years.

Keywords: Gastrointestinal Stromal Tumor; Bariatric Surgery; Laparoscopy; Sleeve Gastrectomy

1. Introduction

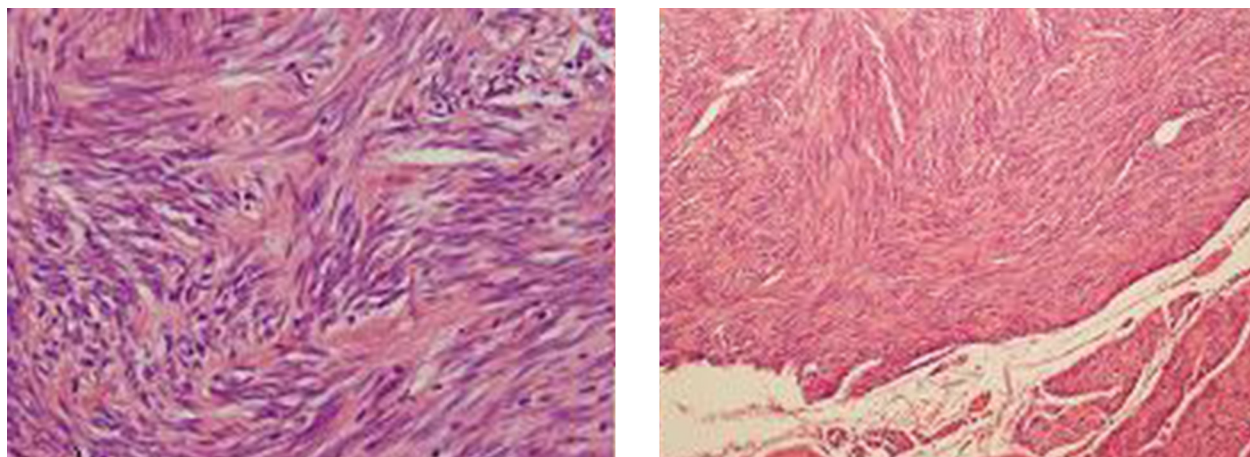
Gastrointestinal stromal tumors (GIST) are most common primary mesenchymal neoplasms of the GI tract, which involve various parts from esophagus to anus (1). During several decades, appellation, cellular origin, diagnosis and prognosis were considerable topics between scientists (2). Initially GIST was known as a smooth muscle neoplasm and considered as leiomyosarcoma; however, with advancement of technology it was found that GIST can be derived from smooth muscle, gastrointestinal autonomic nerve or both of them (mixed GIST) (3). The interstitial cell of Cajal, an intestinal pacemaker, has been recently proposed as exact cellular origin of GIST (4). Although GISTs are known since 1983 (5), they were rarely reported.

In 1998, the role of KIT proto-oncogene was defined in the pathology of GIST (6) and in 2001 a major finding regarding the activity of Imatinib mesylate against GIST was reported (7). The most common treatment of GIST is surgery for small local and non-metastatic tumors and combination of Imatinib and surgery for recurrent or metastatic GIST. Proper imaging studies for GIST include CT scan for patients with suspected abdominal mass, magnetic resonance imaging and positron emission tomography. Incidental finding of GIST during laparoscopic sleeve gastrectomy in patients with morbid obesity has been previously reported and safe laparoscopic

resection of gastric GIST has been proven in one publication (8). In this study, we discussed one patient scheduled for sleeve gastrectomy and GIST was confirmed for her in pathology report.

2. Case Presentation

A 45 year-old female with obesity for five years scheduled for laparoscopic sleeve gastrectomy with a body mass index (BMI) of 38.7 (weight: 99, height: 159 cm) was reported in this study. Patient had a history of cardiovascular disease. At our surgery center, ultrasound is performed for all patients before the operation. However, preoperative endoscopy is performed only for patients with GI tract complaints. Because our patient did not have GI tract symptoms, endoscopy was not performed for her. Ultrasound did not show any mass or lesion. Operation was performed without any problem and any abnormal lesion in abdominal cavity. Postoperation dates were clear. Nonetheless, in follow-up, pathologic examination revealed Gastrointestinal Stromal tumor with a size of 0.5 × 0.5 cm, three centimeters from the nearest margin. Resected margin was free of tumor. Immunohistochemistry (IHC) was indicative of CD34 (QB End-10) positive, Ki67 (MIB1) positive, CD117 positive, S100 negative and SMA (1A4) negative (Figure 1).

Figure 1. Microscopic Examination of the Resected Nodule

It shows a cellular spindle cell tumor with tumor cells growing in the form of fascicles. Most cells have elongated nuclei but few exhibits epithelioid morphology. Nuclear pleomorphism is minimal and mitotic figures are less than five per 50 high power fields. Tumor necrosis is absent.

3. Discussion

Laparoscopic sleeve gastrectomy has become a common bariatric procedure for surgical treatment of morbid obesity with outstanding result in weight reduction during the past decade (9). Although, laparoscopic sleeve gastrectomy was described firstly in 1999, there are many unanswered questions about exact indications of this procedure (10). At our institution, laparoscopic sleeve gastrectomy, Roux-en-Y bypass, gastric banding and gastric balloon are performed as bariatric surgeries. Endoscopy and helicobacter pylori testing are performed as routine preoperative studies for all patients undergoing bariatric surgery in a number of centers worldwide. The importance of preoperative endoscopy has been highlighted by finding pathologies such as esophagitis, Barrett's esophagus, gastric and duodenal ulcers and malignancies, gastritis and duodenitis and other disorders in upper GI tract (8). One of unexpected and incidental pathologic reports during endoscopy is GIST tumor with an incidence of 1.5/100000 annually and incidental pathologic finding during bariatric surgery as around 2% (11, 12). The median age of GIST diagnosis is approximately 60-69 years with an equal gender distribution reported in large series and population-based analysis. The most common involvement of GIST is respectively stomach (60%), jejunum and ileum (30%), duodenum (15%), colorectum (4%), esophagus and appendix (< 1%) (13). Presentation of large and small size GISTs are different as in small types the lining mucosa is usually intact, but large type GISTs can cause bleeding due to ulceration and central cavitation. Typical symptoms of presentation include abdominal pain, nausea, bloating, obstructive jaundice, dysphasia, fever and the most common is GI bleeding (3). Our patient was a 45-year-old female with asymptomatic GIST and if the patient was not admitted due to bariatric surgery,

GIST was progressed and induced symptoms. We did not find any mass during the operation; later GIST was confirmed by immunohistochemical stains with positive results for CD34 and CD117. Other immunohistochemical markers were Ki67 (MIB 1) positive, S100 negative and SMA (1A4) negative. Incidental GIST was reported in a 52 year-old male with a BMI of 40 and positive history of diabetes mellitus, hypertension and obstructive sleep apnea admitted for laparoscopic sleeve gastrectomy. During the laparoscopy a small yellowish, raised, smooth nodule was noted over the antrum near to the greater curvature. Any mucosal lesion was not detected by intraoperative endoscopy. A laparoscopic gastrectomy was performed encompassing the mass with 2 cm margins around the tumor. Pathologic examination reported a 1.5 × 1 cm nodule consisted of spindle cells with minimal nuclear pleomorphism and few epithelioid cells without mitotic activity. Therefore, the tumor was considered benign. Immunohistochemistry had positive results for CD117 and CD34 and negative for S100, desmin and α -smooth muscle actin (8). Nevertheless, in our case, we did not find any lesion during the procedure and GIST was reported in pathologic assay. Safe laparoscopic resection of GIST was first described in 1992 as a proven approach for small exophytic gastric GISTs. Magnified visualization of laparoscopy provides a high rate of small tumors diagnosis during laparoscopic bariatric surgeries. Improved laparoscopic stapling devices enable the surgeon to resect mass with a free margin of 2 or 3 cm as a proper treatment for benign gastric tumors. GISTs disseminate firstly to the liver and abdominal cavity; however, soft tissue, skin and lymph node involvement are seen rarely in this type of tumor. Lung metastases are rare and occur only in advanced stage of GIST. Sanchez BR et al. presented the first case series of GISTs as-

sociated with gastric bypass surgery including four case reports found and resected lesion during operation (14).

According to our case, preoperative upper gastrointestinal endoscopic evaluation seems mandatory in patients older than 40 years to detect subtle pathologic diseases/lesions. Laparoscopic resection of early stage gastric GIST is a useful approach and has been a proper technique in the recent years.

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Authors' contributions

Dr. Seyed Vahid Hosseini, Dr. Reza Roshanravan and Dr. Khairallah Muzhir Gabash did the operation. Dr. Sam Moslemi: organization and writing and final approval; Dr. Mina Heidari Esfahani helped with pathologic comments; Dr. Seyed Vahid Hosseini revising the manuscript for intellectual content and final approval.

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References

- Miettinen M, Lasota J. Gastrointestinal stromal tumors—definition, clinical, histological, immunohistochemical, and molecular genetic features and differential diagnosis. *Virchows Arch*. 2001;**438**(1):1-12.
- Suster S. Gastrointestinal stromal tumors. *Semin Diagn Pathol*. 1996;**13**(4):297-313.
- DeMatteo RP, Lewis JJ, Leung D, Mudan SS, Woodruff JM, Brennan MF. Two hundred gastrointestinal stromal tumors: recurrence patterns and prognostic factors for survival. *Ann Surg*. 2000;**231**(1):51-8.
- Kindblom LG, Remotti HE, Aldenborg F, Meis-Kindblom JM. Gastrointestinal pacemaker cell tumor (GIPACT): gastrointestinal stromal tumors show phenotypic characteristics of the interstitial cells of Cajal. *Am J Pathol*. 1998;**152**(5):1259-69.
- Mazur MT, Clark HB. Gastric stromal tumors. Reappraisal of histogenesis. *Am J Surg Pathol*. 1983;**7**(6):507-19.
- Hirota S, Isozaki K, Moriyama Y, Hashimoto K, Nishida T, Ishiguro S, et al. Gain-of-function mutations of c-kit in human gastrointestinal stromal tumors. *Science*. 1998;**279**(5350):577-80.
- Joensuu H, Roberts PJ, Sarlomo-Rikala M, Andersson LC, Tervahartiala P, Tuveson D, et al. Effect of the tyrosine kinase inhibitor STI571 in a patient with a metastatic gastrointestinal stromal tumor. *N Engl J Med*. 2001;**344**(14):1052-6.
- Beltran MA, Pujado B, Mendez PE, Gonzales FJ, Margulis DI, Contreras MA, et al. Gastric gastrointestinal stromal tumor (GIST) incidentally found and resected during laparoscopic sleeve gastrectomy. *Obes Surg*. 2010;**20**(3):393-6.
- Noel P, Nedelcu M, Nocca D, Schneck AS, Gugenheim J, Iannelli A, et al. Revised sleeve gastrectomy: another option for weight loss failure after sleeve gastrectomy. *Surg Endosc*. 2014;**28**(4):1096-102.
- Akkary E, Duffy A, Bell R. Deciphering the sleeve: technique, indications, efficacy, and safety of sleeve gastrectomy. *Obes Surg*. 2008;**18**(10):1323-9.
- Finnell CW, Madan AK, Ternovits CA, Menachery SJ, Tichansky DS. Unexpected pathology during laparoscopic bariatric surgery. *Surg Endosc*. 2007;**21**(6):867-9.
- Casali PG, Jost L, Reichardt P, Schlemmer M, Blay JY. Gastrointestinal stromal tumors: ESMO clinical recommendations for diagnosis, treatment and follow-up. *Ann Oncol*. 2008;**19**(Suppl 2):35-8.
- Bareck E, Ba-Ssalamah A, Brodowicz T, Eisterer W, Hafner M, Hogenauer C, et al. Gastrointestinal stromal tumors: diagnosis, therapy and follow-up care in Austria. *Wien Med Wochenschr*. 2013;**163**(5-6):137-52.
- Sanchez BR, Morton JM, Curet MJ, Alami RS, Safadi BY. Incidental finding of gastrointestinal stromal tumors (GISTs) during laparoscopic gastric bypass. *Obes Surg*. 2005;**15**(10):1384-8.