

Laparoscopic gastric wedge resection as the method of choice in the treatment of gastrointestinal stromal tumors – A case report

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SUMMARY

Introduction The gastrointestinal stromal tumors (GIST) are the most frequent mesenchymal tumors of the gastrointestinal tract. The surgery of resectable gastric GIST is the primary therapy for these tumors, but the decision regarding the surgical radicality of the procedures is still a point of discussion among surgeons and oncologists.

Case Outline A 74-year-old patient was admitted to hospital with signs of bleeding from the upper parts of the gastrointestinal tract. Urgent gastroscopy was performed and a subepithelial gastric lesion with bleeding ulceration was noted in the region of the fornix. A computed tomography scan of the abdomen showed a tumor in the fornix region with the dimensions of 48 × 32 mm, which was growing mostly intraluminally. After an adequate preoperative preparation the patient underwent a laparoscopic wedge resection of gastric fornix with intramural tumor lesion. The histopathological analysis of the specimen showed a well differentiated GIST (histological grade G1), of the spindle cell type. Based on the immunohistochemical analysis of the specimen it was concluded that the patient was in the IA stage of the disease with a low risk of malignant progression. In the population of patients with GIST, this is the most common group (43%), with low malignant potential, and relapses present in only 3.6% of cases. The patient started with oral food intake on the first postoperative day, the first bowel movement occurred 36 hours after surgery, and the patient was released from hospital on the fourth postoperative day.

Conclusion Based on the aforementioned, we consider that the laparoscopic gastric wedge resection is a safe and efficient surgical procedure. This is primary therapy for most common group of patients with resectable gastric GIST.

Keywords: laparoscopic wedge resection; gastrointestinal stromal tumors; laparoscopy

INTRODUCTION

Gastrointestinal stromal tumor (GIST) is the most frequent mesenchymal tumor of the gastrointestinal tract [1]. In the last decades, with the advances made in the diagnostic and immunohistochemical methods, a clear cut edge has been made between the GISTs and other mesenchymal tumors. During the immunohistochemical examination of the GIST, different tumor markers are used. Among them, CD117 (c-kit antigen) and CD34 show the greatest sensitivity (94% and 70%, respectively) for these tumors and are considered the main diagnostic markers by which the decision if the tumor is GIST or not is made. The most common sites for GIST include the stomach (60%) and small intestine (30%) followed by duodenum (5%), colon and rectum (less than 5%), esophagus (less than 1%), and appendix (less than 1%) [2]. Size of these tumors is between 0.5 cm to 30 cm in diameter. Tumors with the diameter greater than 5 cm with necrosis in the tumor lesion are considered to have intermediate or high malignant potential [3]. Besides tumor size and the presence of necrosis, mitotic index and cellular atypia also have influence on tumors' aggressive behavior. Based on this

parameters, these tumors can be classified as very low, low, intermediate, and high risk lesions [4]. The surgery for resectable gastric GIST is the primary treatment option, but the decision regarding the surgical radicality of the procedures is still a point of discussion among surgeons and oncologists. Since GIST is characterized by an expansive type of growth and it does not significantly invade primary organs, wide resection margins are not necessary (less than 1–2 cm). According to contemporary surgical guidelines, marginal or segmental gastric resection is a possible and sufficient resection procedure. Laparoscopic resection is recommended for gastric GISTs whose larger dimension is smaller than 5 cm, but there are still no clear consensus guidelines for gastric GIST laparoscopic approach based on tumor size and location. Tumor size and location should not be an absolute contraindication to laparoscopic techniques. Large tumors, multicentric and specific localization of gastric GIST require open extensive resection (total or subtotal gastrectomy) [5, 6]. The GIST do not spread to lymph nodes and lymphadenectomy is not recommended during the surgical procedures [7]. In cases when we have unresectable GIST or dissemination of the primary disease,

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the patients prognosis is adverse, and before the surgery, biotherapy (imatinib or sunitinib) is recommended [8, 9].

CASE REPORT

A 74-year-old patient was admitted to hospital as an urgent case, with signs of bleeding from the upper parts of the gastrointestinal tract. After the admission an urgent gastroscopy was performed, during which a subepithelial lesion with bleeding ulceration was noted. The lesion was located on the greater gastric curvature, in the region of the distal fornix. The source of bleeding was treated with adrenalin solution. After the intervention, the patient was given proton-pump inhibitors, infusion solutions, and because of lower values of blood count, two units of blood. After the abovementioned therapy, he hadn't experienced any bleeding episodes. A computed tomography (CT) scan of the abdomen was performed, and it revealed a tumor in the fornix region, toward the left diaphragm and in the vicinity of the spleen, with the dimensions of 48 × 32 mm, growing mostly intraluminally, but with a small extraluminal portion. There were no signs of dissemination of the disease intraabdominally. On the second gastroscopy, no signs of bleeding were present, and the ulceration spot was partially epithelized.

After an adequate preoperative, cardiologic and anesthesiologic preparation, the patient underwent a laparoscopic surgical procedure, under the conditions of general endotracheal anesthesia. After performing the pneumoperitoneum, two 12 mm ports and two 5 mm ports were placed, through which the optical instruments, forceps, ultrasound scissors, and endoscopic linear staplers were introduced. The patient was in the anti-Trendelenburg position. After skeletization of the greater curvature of the upper third of stomach corpus and fornix with ultrasound scissors, the intramural part of the tumor was exposed from surrounding structures. With three staple loads of the endoscopic linear 60 mm stapler, a wedge resection of the stomach fornix with the tumor mass was performed. The resection's margins were free of tumor. During surgery, the patient lost about 50 ml of blood. The resection specimen was pulled out of the abdomen through an infraumbilical port by an Endopouch (Ethicon, Inc., Somerville, NJ, USA). The surgery duration was 100 minutes. The postoperative course was uneventful. The patient started with oral food intake on the first postoperative day, he got the first bowel movement 36 hours after surgery and was released from hospital on the fourth postoperative day. The surgical sutures were removed on the seventh postoperative day.

The histopathological analysis of the specimen showed a well differentiated gastrointestinal stromal tumor (histological grade G1), of the spindle cell type. The tumor was not present on the surgical resection margins. The mitotic count was that of a low risk tumor (1 mitosis / 5 mm² or 1 mitosis on 50 high-power fields). The tumor's largest dimension was smaller than 5 cm (46 × 35 × 30 mm). Necrotic foci were not identified in the specimen. The immunohistochemical profile of the lesion was as follows:



Figure 1. Preoperative CT scan of the patient's abdomen



Figure 2. Intraoperative photograph showing resected specimen

CD117 (+), CD34 (+), vimentin (+), desmin (-/+), DOG1 (+), alfaSMA (-/+), chromogranin (-), synaptophysin (-), Ki67 (+, in about 20% of tumor cells).

DISCUSSION

Although GIST represents only 1–3% of all the gastrointestinal tumors, they are the most common type of mesenchymal tumor. The delayed diagnosis of these tumors is usually due to the nonspecific clinical presentation. Sometimes the symptoms are just nonspecific epigastric pain, dyspepsia and swelling, based on which a clinical examination is performed. Because of this, these tumors can reach great size without significant clinical presentation. The first and most expressed clinical sign is bleeding (in about 58–61% of cases) [10].

Our patient was diagnosed with a bleeding intramural tumor, smaller than 5 cm, located in the region of the gastric fornix in the greater curvature, by gastroscopy and abdominal CT scan. Regarding the data from the literature, women are affected by these tumors more often than men (60% of patients are female), with an average age of 60 ± 10.2 (standard deviation). The upper third of the stomach wall is the most common localization (about 50%), and 61% of the tumors are sized 2–5 cm. The standard diagnostic procedures are gastroscopy, intraluminal sonography, and abdominal CT scan [11]. In

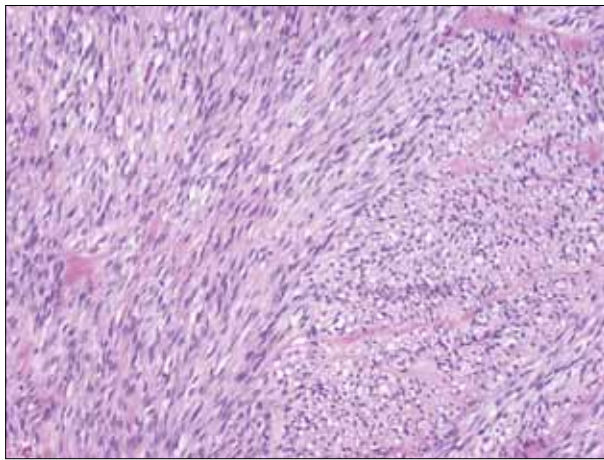


Figure 3. Gastrointestinal stromal tumor, spindle cell type (× 200, H&E)

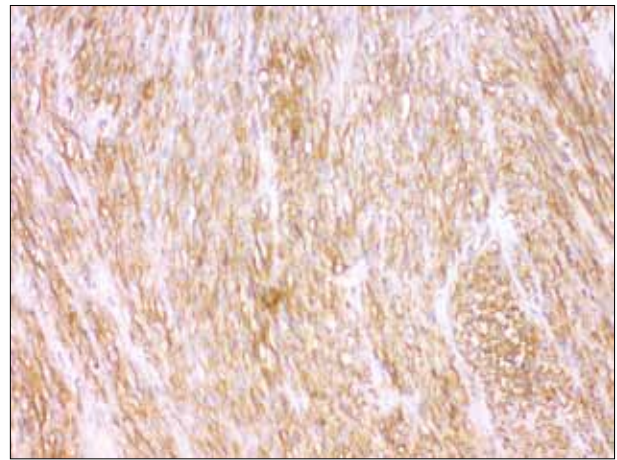


Figure 4. Spindle cell type GIST showing strong immunopositivity for anti-DOG1 (× 200, anti-DOG1 antibody)

our case, because of the emergent admission and risk of recurrent bleeding, the intraluminal sonography was not performed. The two diagnostic procedures that were performed provided sufficient data about the size, localization, and relationship with surrounding structures and the esophagogastric transition zone. There was no data about the dissemination of the disease.

Based on the preoperative diagnostics, it was decided to perform a laparoscopic wedge resection of the stomach. This type of surgical radicality was, according to the literature data, sufficient for a tumor sized 5 cm and less, without visible intratumoral necrosis [12]. At the same time, we had preserved enough of the healthy stomach tissue to have an adequate resection without having collision with the esophagogastric transition zone. Special care, during the preparation and tumor extraction, was taken to prevent peritoneal seeding and possibility of capsular rupture. This iatrogenic peritoneal dissemination is the cause of the recurrence of the disease in about 20% of patients. Due to this fact laparoscopic resection requires trained and experienced laparoscopic surgeons. According to the literature data, during GIST surgery, without signs of dissemination of the disease, it is enough to reach clean resection margins (1–2 cm) to have an R0 resection [6, 13]. Since GISTs do not show lymphogenic spread, lymphadenectomy is not necessary.

In the last ten years, GIST has often been removed laparoscopically. According to available data from the literature, about 40% of patients underwent laparoscopic surgery, and this fact reduced the postoperative morbid-

ity. The reduction of the postoperative pain and blood loss, faster start of oral intake, and a better esthetic effect are some of the advantages of this minimally invasive technique [14, 15]. Data from the literature showed no significant difference in the five-year survival percentage between laparoscopic wedge resection and open wedge resection treated GIST patients (93.7% for the first, and 95.5% for the second group) [16].

The most important prognostic parameters for GIST are tumor size and the number of mitoses on high-power fields. Based on this parameters, tumors are classified by the American Joint Committee on Cancer (AJCC), the TNM Classification of Malignant Tumours system, and the National Institute of Health (NIH) [17, 18]. Based on the immunohistochemical analysis of our specimen, it was concluded that the patient was in IA stage of the disease with low malignant potential. In the population of patients with gastric GIST, this is the most common group (43%), and the relapses are present in only 3.6% of cases [17, 18, 19]. According to the AJCC classification, stage I of GIST is the most frequent in the general population, with 70% of cases [20]. In this case the patient was resectable, underwent primary surgical treatment, had low malignant potential GIST, and it was not necessary to prescribe biological therapy [21].

Based on the aforementioned, we consider that the laparoscopic gastric wedge resection is a safe and efficient surgical procedure. This is primary therapy for the most common group of patients with resectable gastric GIST. The procedure is characterized by quick recovery and low percentage of postoperative complications.

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Лапароскопска клинаста ресекција желуца као метод избора у лечењу гастроинтестиналних стромалних тумора – приказ случаја

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КРАТАК САДРЖАЈ

Увод Гастроинтестинални стромални тумори (ГИСТ) најзаступљенији су мезенхимски тумори гастроинтестиналног тракта. Хируршки третман ресектабилних ГИСТ-ома желуца је примарна терапија ових тумора, али је одлука о начину извођења хируршког захвата и опсежност ресекције желуца остала до данас предмет дискусије између хирурга и онколога.

Приказ случаја У овом раду дат је приказ пацијента старог 74 године, који је примљен на болничко лечење као хитан случај због знакова крварења из горњих партија гастроинтестиналног тракта. Дијагностичким процедурама (гастроскопија и компјутеризована томографија абдомена) дијагностикована је интрамурална крварећа туморска промена у регији форникса желуца, промера 48 × 32 mm, без колизије са езофагогастричним прелазом. Није било знакова за дисеминације основне болести интраабдоминално. На дату конзервативну терапију дошло је до смиривања крварења на контролној гастроскопији, док је место егзулцерације делимично епителизовано. Након адекватне

преоперативне припреме пацијент је у условима опште анестезије оперисан лапароскопским путем, када је урађена клинаста ресекција форникса желуца са тумором. Имунохистохемијском анализом препарата закључено да се ради о гастроинтестиналном стромалном тумору који је добро диферентован (хистолошки градус G1), ниског митотоског индекса (мање од 1 митозе на 50 поља великог увећања) без присутне некрозе, што говори у прилог томе да се ради о ГИСТ-ому ниског малигног потенцијала. Постоперативни ток протекао уредно, пацијент четвртог постоперативног дана пуштен на кућно лечење.

Закључак Лапароскопска клинаста ресекција желуца је сигурна и ефикасна оперативна процедура, која се изводи као примарна терапија код најзаступљеније групе пацијента са ГИСТ-ом желуца. Ова процедура се одликује брзим опоравком пацијента, са малим процентом постоперативних компликација.

Кључне речи: клинаста ресекција желуца; гастроинтестинални стромални тумор; лапароскопија

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