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**Novel combined endoscopic and laparoscopic surgery for advanced T2 gastric cancer:
Two case reports**

Dai JH *et al.* A new treatment

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Abstract

BACKGROUND

The standard treatment for advanced T2 gastric cancer (GC) is laparoscopic or surgical gastrectomy (either partial or total) and D2 lymphadenectomy. A novel combined endoscopic and laparoscopic surgery (NCELS) has recently been proposed as a better option for T2 GC. Here we describe two case studies demonstrating the efficacy and safety of NCELS.

CASE SUMMARY

Two T2 GC cases were both resected by endoscopic submucosal dissection and full-thickness resection, and laparoscopic lymph nodes dissection. This method has the advantage of being more precise and minimally invasive compared to current methods. The treatment of these two patients was safe and effective with no complications. These cases were followed up for nearly 4 years without recurrence or metastasis.

CONCLUSION

This novel method provides a minimally invasive treatment option for T2 GC, and its potential indications, effectiveness and safety needs to be further evaluated in controlled studies.

Key Words: Novel combined endoscopic and laparoscopic surgery; T2 gastric cancer; Endoscopic submucosal dissection and full-thickness resection; Laparoscopic lymph nodes dissection; Minimally invasive; Case report

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Core Tip: We propose a new method of combining endoscopic local lesion resection and laparoscopic lymph nodes dissection for 2 cases of advanced T2 gastric cancer (GC). And this new method has the advantages of precision, being minimally invasive with the similar outcome as surgical resection. It is a novel method providing a minimally invasive treatment option for T2 GC.

INTRODUCTION

The standard treatment for advanced gastric cancer (GC) is laparoscopic or surgical gastrectomy (either partial or total) and D2 lymphadenectomy^[1]. Here, we report two cases indicating that endoscopic local lesion resection combined with laparoscopic lymph node dissection may be an effective treatment for T2 GC. These cases include ² a 23-year-old male with a 2 cm × 2 cm T2 poorly differentiated gastric antrum adenocarcinoma and ² a 54-year-old female with a 2 cm × 2.5 cm T2 poorly differentiated gastric body adenocarcinoma which were both resected by endoscopic submucosal dissection and full-thickness resection (ESDFTR), and laparoscopic lymph nodes dissection with good postoperative recovery. This method has the advantage that it is more precise and minimally invasive compared to current methods. With this in mind, its potential indications, effectiveness and safety need to be further evaluated in controlled studies.

At present, partial or total gastrectomy is used in the minimally invasive treatment of advanced GC. However, this procedure has the drawback that it destroys the normal anatomical structure of the stomach seriously affecting its physiological function. It is often ¹ associated with substantial trauma, slower recovery, higher complication rate and decreased postoperative quality of life. With advances in endoscopic resection technology, endoscopic submucosal dissection (ESD) or closed laparoscopic and endoscopic cooperative surgery is increasingly applied for T1 early cancer^[2]. Endoscopic full-thickness resection technology can completely remove benign tumors of the muscularis propria^[3]. For treatment of T2 GC, we report a novel combined endoscopic and laparoscopic surgery (NCELS) to resect local lesion with ESDFTR (Figure 1) along with lymph node removal by laparoscope, which together achieved complete resection of the lesion and thorough clearing of the lymph nodes. This procedure also allowed preservation of the anatomical structure and physiological function of the stomach thereby enhancing the postoperative quality of life of the patients.

CASE PRESENTATION

Chief complaints

4

A 23-year-old man and a 54-year-old woman were admitted to our hospital with poorly differentiated gastric adenocarcinoma.

Personal and family history

No specific medical history.

Laboratory examinations

Carcinoembryonic antigen (CEA) test values were in the normal range.

Imaging examinations

Gastroscopy revealed the male patient with a 2 cm × 2 cm protuberant lesion on the greater curvature of the anterior wall of the gastric antrum (Figure 2) and the female patient with a 2 cm × 2.5 cm 0-IIa + IIc type lesion on the greater curvature of the lower gastric body (Figure 3). Pathological examination showed poorly differentiated adenocarcinoma. Contrast-enhanced computed tomography (CT) of the abdomen showed that areas of antrum and gastric body were slightly thickened. No metastasis to the lymph nodes or other organs was observed on the chest and abdomen CT scan. Endoscopic ultrasonography revealed invasion of the muscularis propria.

FINAL DIAGNOSIS

The clinical diagnosis in both cases was T2 GC without lymph node and other organ metastasis. Postoperative pathological diagnosis was T2 GC for both cases.

TREATMENT

The patient is placed under general anesthesia with endotracheal intubation. The procedure includes four steps as follows:

Step 1: Determine the demarcation line: Magnifying endoscopy with narrow band imaging was used to determine the demarcation line of the lesion, marking was set to 1.5 cm outside the lesion.

Step 2: ESD/FTR: After submucosal injection, the lesion was dissected by circumferential ESD until the tumor infiltrated deeper (the submucosa was thin or unclear), then dental floss was used to traction the lesion. A whole layer incision was performed at 0.5-1.0 cm lateral to the deep infiltration, followed by circumferential full-thickness resection, and the resected lesion was removed.

Step 3: Gastric wound suture and lymph node dissection: The gastric wound was sutured with endoscope or laparoscope. Then regional lymph nodes were radically dissected (Figure 4).

Step 4: Pathological examination: The resected gastric specimens and lymph nodes were pathologically examined to determine the depth of invasion and lymph node metastasis.

OUTCOME AND FOLLOW-UP

Two cases were characterized as poorly differentiated adenocarcinoma, infiltrating into the superficial layer of the muscularis propria. One case had negative lymph node metastasis and the other case had nerve infiltration. Postoperative pathological diagnosis was T2 GC for both cases.

The patients were discharged 8 d and 10 d after operation. No local or metastatic recurrence of lymph nodes and organs were found in regular review of gastroscopy (Figure 5) and enhanced CT of the abdomen within 4 years for the male patient and 3 years for the female patient following the operation. CEA test values remained in the normal range. Their postoperative quality of life was good, with no significant gastrointestinal symptoms, retaining a normal diet and weight.

DISCUSSION

At present, there are two main techniques for minimally invasive treatment of GC: endoscopic resection and laparoscopic radical resection. Both endoscopic and laparoscopic therapies have their own advantages and limitations in the treatment of T2 GC. The advantages of endoscopic resection are that the lesion can be observed under

direct vision, the resection range of the lesion can be accurately determined, the lesion can be completely removed, and the normal gastric anatomy and gastric physiological function can be preserved, thus ensuring postoperative quality of life of the patient. However, the limitation is that the lymph nodes cannot be cleared and the risk of lymph node metastasis cannot be eliminated^[4]. The advantage of laparoscopic surgery is that it can completely remove the lesion and thoroughly clear the lymph nodes. However, because T2 cancers grow in the lumen, the extent of the lesion cannot be accurately determined outside the gastric wall. Therefore, laparoscopic surgery alone takes partial or total gastrectomy, which destroys the normal anatomical structure of the stomach and affects the physiological function of the stomach, thus seriously affecting postoperative quality of life of the patient, combined with a remaining risk of local residue and recurrence^[5,6].

T2 GC often has deep infiltration in the central part of the lesion, while the surrounding region is shallow, with mucosal or submucosal infiltration. Using ESD/FTR technology, submucosal dissection can be used to completely remove the mucosal and submucosal infiltrating lesion, followed by full-thickness resection to remove the lesion in the deep submucosa and muscularis propria, which can minimize the damage to the gastric anatomical structure providing a more precise and minimally invasive treatment option. In addition, laparoscopy is a more reliable procedure to seal the gastric wound. Furthermore, the lymph nodes can be thoroughly cleared of metastatic tumor tissue. Therefore, the NCELS can both provide a cure and be precise and minimally invasive. Compared with traditional surgery, NCELS for T2 GC achieved complete resection of the lesion, thorough clearing of the lymph nodes, and preservation of the anatomical structure and physiological function of the stomach. It has the advantages of less trauma, fewer complications, lower cost, and better postoperative quality of life.

CONCLUSION

The novel method described here provides a minimally invasive treatment option for T2 GC. However, the selection of standard indications, surgical methods, short-term and

long-term complications, long-term recurrence rate, and prognosis still need further evaluation.

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