INTRODUCTION

In the past decade, minimal access surgery is moving towards minimizing the surgical trauma by reducing numbers and size of the portals. In the last few years, a novel technique with a single-incision laparoscopic approach has been described. This technique has mainly been used for laparoscopic cholecystectomy, but recent reports showed feasibility even in more complex operations such as gastric, liver and pancreas resection.

In the English literature, there are few papers dealing with single-port laparoscopic gastrointestinal resections. The main reason is that the majority of systems available for a single-port laparoscopic surgery needs specific articulating instruments, use of small laparoscopes and allows poor triangulation. The use of a new single-port platform based on gelatin cap is essential to avoid triangulation problems and precluded the use of articulated instruments.

The objective of this paper is to present technical details of single-port laparoscopic partial gastrectomy and the use of this procedure in one patient with gastric duplication.
The patient is placed in a supine and reverse Trendelenburg position with surgeon between his legs. First assistant is on the right side with the monitor placed on the patient’s cranial side. Under general anesthesia, a transumbilical 3 cm skin incision is performed (Figure 1a). A single-incision advanced access platform with gelatin cap, self-retaining sleeve and wound protector (GelPoint, Applied Med. R.S. Margarita, CA, USA) is introduced through this incision. Three 5-12 mm operating ports are introduced through the single-port device (Figure 1b). Due to the gel cap and sleeves, no articulated instruments are necessary. CO₂ pneumoperitoneum is established at 12 mmHg. A rigid 30 degree 10 mm laparoscope is introduced. The single-port is able to accommodate at the same time three instruments with no triangulation prejudice: a 10 mm laparoscope, a 12 mm ultrasound probe and a 5 mm instrument such as harmonic scalpel, grasper, scissor or dissector (Figure 2c).

Operation begins with access to the lesser sac by opening the omentum along the greater curvature of the stomach using harmonic scalpel (Ultracision, Ethicon Endo Surgery, Cincinnati, OH, USA). Once the stomach is fully exposed a stay suture is place around the tumor. Gastric wall is divided with cautery 1 cm away from the tumor and the tumor is excised. Gastric wall is closed with running suture in one or two layers. No drain is used. Umbilical incision is closed (Figure 1d).

RESULTS

This procedure was used in a 47-year-old woman with a 4.2 cm retroperitoneal cystic lesion found by routine ultrasonography. Endosonography, MIR, CT and biopsy findings were consistent with pancreatic mucinous cystadenoma (Figure 2a). The initial plan was to perform a single-port distal pancreatectomy with splenic preservation. Intraoperative ultrasound (SonoSite, Inc., Bothell, WA, USA) indicated that the tumor was not from pancreatic origin. Absence of cleavage...
plane between gastric wall and the cystic tumor was consistent with the diagnosis of gastric duplication that was resected and removed through the single-port with the technic above described. Further dissection was done and it was able to dissect the cystic tumor away from the superior border of the pancreas. Absence of cleavage plane between gastric wall and the cystic tumor was consistent with the diagnosis of gastric duplication (Figure 2b). Gastric duplication was finally removed without opening of the cyst or gastric mucosa. Surgical specimen was removed through the single-port (Figure 2c and d). Gastric mucosa was closed with running suture. Umbilical incision was sutured and abdominal cavity was not drained. Frozen section confirmed the diagnosis and no malignancy were found in the surgical specimen.

Operative time was 200 minutes. Blood loss was minimal, and the patient did not receive transfusion. The recovery was uneventful, and the patient was discharged on postoperative day 2. Final pathology disclosed gastric duplication without malignant transformation. Patient had no signs of disease at nine months after operation. Final aspect of the umbilical incision was good (Figure 1d).

**DISCUSSION**

To the best of knowledge of the authors, this is the first case of gastric duplication treated by this method reported in the English literature.

Gastrointestinal duplications are rare congenital malformations that may arise from the oral cavity to the rectum. The ileum is more frequently affected, while gastric duplications comprises as low as 4% of all digestive duplications. Its usual location is the greater curvature. Sixty-seven percent of all gastric duplication cysts are diagnosed in the first year of life, when they present abdominal mass and gastric obstruction. Less than 25% of the cases are diagnosed after 12 years of age and in adult life is very rare, but may be associated with malignant degeneration. In this setting, diagnosis may be difficult, as gastric duplications are usually asymptomatic or present with vague symptoms, such as weight loss, anemia, epigastric fullness or nausea. The author's previous experience with gastric duplication resection showed that gastric duplication usually shared the same seromuscular layer with the stomach. Therefore, meticulous dissection was needed in order not to open the gastric mucosa. However, whenever necessary, as in cases of more infiltrative neoplasms, opening of gastric mucosa can safely be performed.

The novel single-port platform may increase the adoption of single-port operations. Although several issues such as costs and learning curve of this technique remain to be studied, the cosmetic benefits of single-incision approach are obvious.

There are very few published articles on laparoscopic resection of duplication cysts in adults affecting the stomach. In the past decade, minimal access surgery is moving toward minimizing the surgical trauma by reducing numbers and size of the port. In the last few years, a novel technique with a single-incision laparoscopic approach has been described. It is especially used in young female due to the good cosmetic results. Single-incision laparoscopic procedure is less invasive than standard multiport laparoscopy but may have unique difficulties for the laparoscopic surgeon. First, retraction is significantly limited. The introduction of a camera and several instruments parallel to each other may result in decreased range of motion and collision of instruments. The single-port platform used in this case allowed the use of standard instruments with no loss of triangulation due to the presence of self-retaining sleeves which maximizes internal working diameter. It was able to use a high definition 10 mm laparoscope during all steps of the operation.

**CONCLUSION**

Single-port laparoscopic gastric resection is feasible. This new surgical platform may increase the adoption of single-port operations. Although several issues such as costs and learning curve of this technique remain to be studied, the cosmetic benefits of single-incision approach are obvious.

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