

Left Side First Approach in Nissen Procedure for Gastroesophageal Reflux Disease; How We Do It.

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Abstract

Introduction

Gastroesophageal reflux disease (GERD) is a major public health problem. The "gold standard" in the surgical treatment of this condition is the laparoscopic technique called Nissen fundoplication.

Aim

This paper presents a safer alternative of the laparoscopic Nissen fundoplication, with special focus on the most difficult moment of the intervention, the creation of a retroesophageal passage.

Material and method (presentation of the surgical technique)

The conventional Nissen technique consists of the dissection of the esogastric junction in a clockwise direction, right to left: right pillar, hiatus, left pillar, retroesophageal passage, skeletonization of the fornix and reconstruction of the valve. We decided to perform a technique inspired from laparoscopic sleeve gastrectomy, which starts in anti-clockwise direction, with the skeletonization of the upper third of the greater curvature of the stomach, then continues with the complete dissection of the left diaphragmatic pillar ("left side first") and finally with the dissection of the right pillar and the creation of the retroesophageal passage, thus, the procedure becoming less complicated. A complete decollement of the area nuda is performed, this way avoiding possible complications at this stage, like: bleeding from the area nuda or short vessels, ruptures of the stomach, esophagus, spleen, penetrating the thoracic cavity with a retroesophageal clamp, etc.

Results

Introduced in 2011, this technique was applied with success in all 20 consecutive cases of hiatus hernia operated in our clinic. There were neither intraoperative accidents and conversions nor early or late postoperative complications. 19 cases were primary Nissen while one case was a recurrent hiatal hernia after an insufficient cruroplasty made in another center. There were three cases in which we had to use Parietene Composite type mesh to strengthen the cruroplasty.

Conclusion

The applied modification has improved the original laparoscopic Nissen fundoplication technique, thus this has become a less complicated procedure at the same time providing more security to the patient.

Keywords: GERD; Floppy Nissen; Diaphragmatic Pillars Dissection

Introduction

Gastroesophageal reflux disease (GERD) is a major public health issue, which is caused by the quasi-constant problem of axial hiatus hernia. Short-term drug therapy has relative efficiency, which rather alters the properties of the refluxate than the reflux itself. Due to the mechanical character of the deficiency and concerns related to the lifelong use of proton pump inhibitors (PPIs), surgery remains the first therapeutic option for hiatal hernia with esophageal reflux (GERD).

The laparoscopic Nissen fundoplication technique is now considered the "gold standard" for the treatment of hiatal hernias, and the widely adopted two main surgical techniques are: the Short Floppy Nissen technique involving the skeletonization of the gastric fornix

and the Nissen-Rosetti technique with no skeletonization of the short gastric vessels [1].

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The key element of the initial dissection in both techniques is the right diaphragmatic pillar, preparation being performed in clockwise direction, from right to left. The key element of this technique is the creation of the retroesophageal passage, the main "source" of perioperative complications as: hemorrhage, splenic decapsulation, gastroesophageal perforations, intrathoracic "migration" with or without pleural lesions.

Aim

This paper aims to present a safer dissection technique of the esogastric junction, technique derived from the longitudinal laparoscopic sleeve gastrectomy (LSG), which consists of the primary preparation of the gastric fornix (future valve), the release of the gastric area nuda and full exposure of the left pillar, only then followed by the "right to left" approach of the right pillar and the construction of the retroesophageal passage.

Method

The study, performed during April 2011 – January 2014, was approved by the Ethics Committee of the "St. Constantin" Hospital, Brasov. We included in the study 20 patients suffering from hiatal hernia, diagnosis established on the following criteria: clinical, based on the assessment scales for gastroesophageal reflux disease, upper gastrointestinal endoscopy, hiatal hernia also confirmed by CT scan. There were no patients excluded from the study, all interventions were performed by the same surgical team. In 19 cases, patients underwent primary treatment of hiatal hernia, we had one case of recurrence following Nissen surgery, referred to us from another healthcare center.

Presentation of the Technique

The surgical setup is virtually identical to the one used during LSG, in French position, while operating the surgeon takes the standing position between the patient's legs, the first surgical assistant is located on the left of the patient, the instruments are placed between the surgeon and surgical assistant. The Storz laparoscopy tower is used with the monitor placed above the patient's head and ValleyLab Force Triad electrosurgery platform with Ligasure 10 mm blunt tip vessel sealer. We use 5 trocars positioned fanwise in the upper abdominal quadrants as follows (Figure 1):

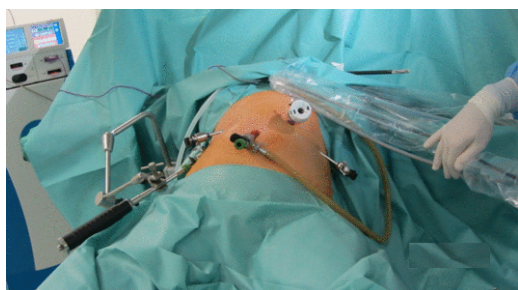


Figure 1: Surgical setup

1. 10 mm optical trocar placed in the umbilical or supraumbilical area according to the patient's height;

2. 12 mm trocar placed in the left paramedian area at 3-4 cm in the supraumbilical area: for Ligasure and suture (surgeon's right hand);

3. 5 mm trocar placed in the right paramedian area at 3-4 cm in the supraumbilical area: holding clamp (surgeon's left hand);

4. 5 mm trocar placed in the left anterior axillary line: assistant's holding clamp;

5. 10 mm trocar placed in the right anterior axillary line: self-retaining snake retractor.

The procedure begins with the skeletonization of the upper third of the greater curvature of the stomach, the opening of the omental bursa by using Ligasure Atlas vessel sealing instrument, which facilitates dissection at the division of the gastric wall. (Figure 2 and 3)

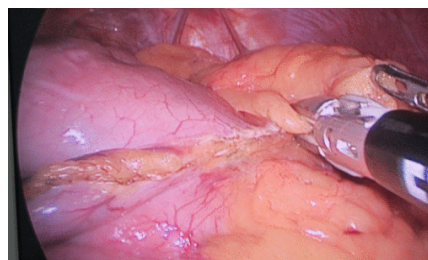


Figure 2: Starting the skeletonization of the greater curvature of the stomach

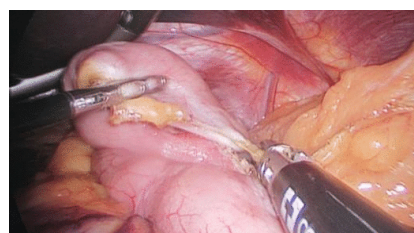


Figure 3: Sectioning of the short gastric vessels

The procedure continues similarly to LSG: sectioning of the posterior vessels, complete release of the area nuda, the exposure of the left diaphragmatic pillar, sectioning of the Leimer Bertelli membrane, thus carefully preparing the left side of the retroesophageal passage. (Figure 4)

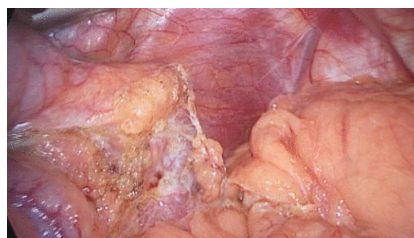


Figure 4: Complete exposure of the left pillar after releasing the gastric fornix

At this stage the stomach is released and the dissection of the right side of the esogastric junction is started according to the common procedures of the conventional technique as follows: sectioning the pars flaccida of the lesser omentum, exposure of the right pillar, sectioning the parietal peritoneum at the level of the right and upper esophageal hiatus, dissection of the fat pad in the hiatus, blunt retroesophageal penetration made simple and easy by applying left-side dissection, lifting the esophagus on a textile mesh. (Figures 5 to 11).

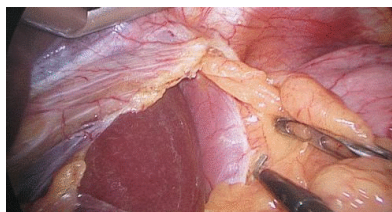


Figure 5: Exposure of the right side of the gastroesophageal junction and reduction of the hernia

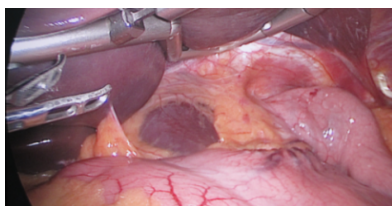


Figure 6: Sectioning of the pars flaccida and the exposure of the right pillar

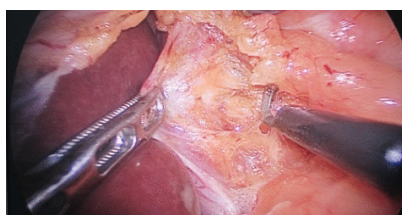


Figure 7: Dissection of the esophageal hiatus

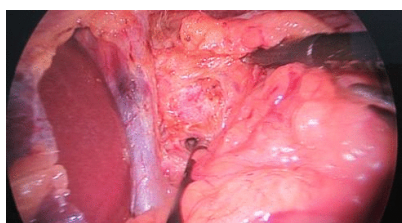


Figure 8: Retroesophageal blunt dissection

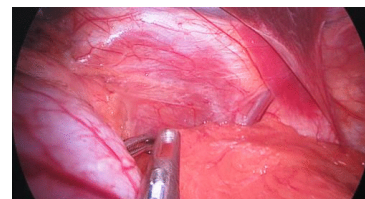


Figure 9: Easily accessed retroesophageal passage

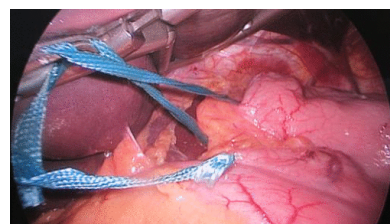


Figure 10: Lifting of the esophagus on a textile mesh

The mesh is drawn down by traction to enlarge the retroesophageal passage to allow the formation of a large, tension-free valve, "abdominalizing" as much of the lower esophagus as possible, then cruroplasty is performed around the esophagus with single silk or 2-0 polypropylene thread applied in X shape in the upper area. (Figure 11 and 12).

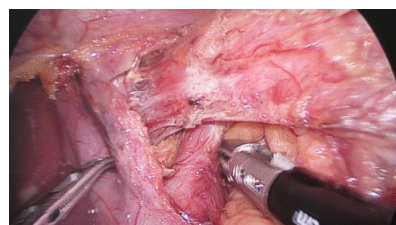


Figure 11: The final aspect of the hiatus before calibration

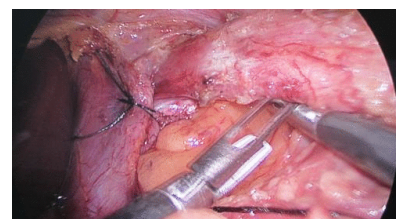


Figure 12: Single thread applied in X shape for calibration, placed in the upper area

If the lesion is too large stitches are placed both below and above the esophagus and a reinforcement mesh is applied too (Figure 13).



Figure 13: Composite reinforcement mesh around the esophagus

We finalize the intervention by reconstructing the valve with 3 staples of 2-0 silk/Prolene thread, the superior one anchored to the esophagus and sometimes to the right pillar. (Figure 14 and 15) We do not drain this area.

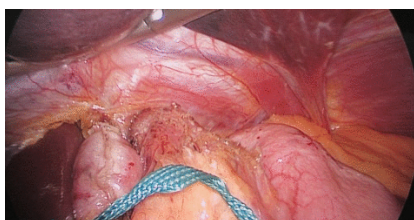


Figure 14: Floppy valve, situated in the right position without tension

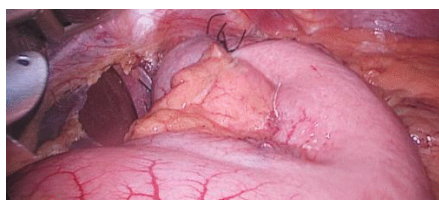


Figure 15: Final aspect of a Floppy Nissen valve

The presence of a large accessory left hepatic artery in the small omentum requires a delicate dissection and its preservation. (Figure 16 and 17)

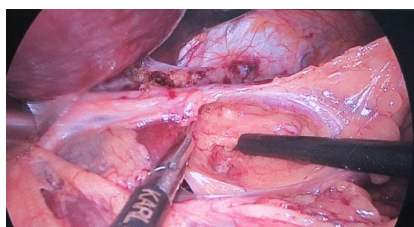


Figure 16: Hiatal dissection preserving the left hepatic artery

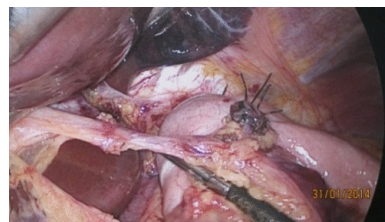


Figure 17: The final aspect of the valve situated above the artery

Results

This article is not a retrospective study but a presentation of a surgical technique. We used this technique in the last 20 cases consecutively, with no record of inconveniences, conversions, significant peri- and postoperative complications, change of intraoperative strategies (choosing a different type of Dor or Toupet valve). We did not record any persistent reflux episodes or gas and bloating in the studied casuistry. The duration of the follow-up period was between 1 and 34 months.

Discussions

We intended to achieve a simpler alternative, but most of all a safer version of the Floppy Nissen technique by simplifying the retroesophageal passage. The "left side first" approach allows safe intervention, without possible complications during the reconstruction of the retroesophageal passage, like: bleeding, perforation, splenic injuries, "misplacing" the left hand clamp in the thorax or area nuda.

This technique is similar to the skeletonization of the greater curvature and area nuda in a laparoscopic sleeve gastrectomy, thus becoming an almost natural development for experienced teams in bariatric surgery. The surgical setup is the same except for trocar No. 3. Its size is 5 mm instead of 10 mm.

The specialty literature describes other technical procedures that start dissection on the left side of the esogastric junction, variants that significantly differ from the one described above in some essential elements [2-4]:

- Top-down dissection of the left pillar.
- Sectioning the Leimer-Bertelli membrane only and complete release of the left pillar, similar to the gastric banding technique.
- The skeletonization of the fornix is performed subsequent to the retroesophageal passage, after the most difficult moment of the intervention, where the major benefit is the complete exposure of the area.

Conclusion

The complete dissection of the left flank is the key to a large, tension-free floppy valve, thus efficient and without complications for the patient.

Inspired from the longitudinal laparoscopic sleeve gastrectomy, the original technique is slightly changed, which simplifies a lot and at the same time makes the laparoscopic Nissen technique more secure. The

key point of this intervention is the retroesophageal passage and the key point of the retroesophageal passage is the left pillar and the area nuda and not the right pillar, which is evident. For this reason, dissection should start from the left pillar and area nuda to the right, so the "left side first" technique should be applied.

Conflict of interest

Authors have no conflict of interest to declare

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