Nissen fundoplication: how I do it

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Introduction

Laparoscopic Nissen fundoplication is now the standard approach for treatment of severe gastro-oesophageal reflux disease (GORD), not responding to medical treatment [1]. GORD affects 10% of the population and it causes significant morbidity to this group of people. The main cause for GORD is the dysfunctional lower oesophageal sphincter (LOS) rather than an over production of acid [2].

Rudolph Nissen (1896-1981) described the first fundoplication in 1950 [3,4]. The procedure has been revised many times and currently laparoscopic Nissen fundoplication is the gold standard for symptomatic GORD [5]. In Sri Lanka the procedure is offered to a very selective group of patients as pH and manometric studies are not freely available. The preceding two articles by our medical colleagues describe the value and the importance of evaluating symptomatic GORD patients.

Indication

The indications for surgery for a patient with GORD are,

1. Ineffective medical management.
2. Need for long term medical treatment: The long term treatment with proton pump inhibitors can cause undesirable side effects. In addition patients can have a poor quality of life due to long term drug treatment.
3. Alarming signs - asthma, chest pain, aspiration, hoarseness.
4. Para-oesophageal hernia.
5. Recurrent reflux.
6. Complications after previous antireflux surgery.

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Contraindications

Open fundoplication is now almost an unacceptable procedure. The contraindications for laparoscopic fundoplication are,

1. Portal hypertension.
2. Contraindication for general anaesthesia.
3. Coagulopathy.
4. Inexperienced surgeon.

Previous surgery, short esophagus and morbid obesity (BMI>35kg/m^2) will make it a risky operation. For patients with BMI of >35kg/m^2 it is recommended to do a gastric bypass surgery. Patients with esophageal dysmotility disorders should also be excluded from the procedure. The learning curve for a laparoscopic Nissen fundoplication would be at least 20 mentored procedures [6].

Procedure

Prior to the procedure it is important to do an upper GI endoscopy by the operating surgeon at which he should measure the length of the gastro-oesophageal junction (GOJ). In addition 24-hour pH monitoring, oesophageal manometry, impedance monitoring, fluoroscopic real time swallowing studies and gastric emptying testing are important.

Technique

After the patient is anaesthetised, patient is placed in Lloyd Davies stirrups in the reverse Trendelenburg position. The operating surgeon stands in between the legs of the patient and the camera holding surgeon will stand on the left of the patient while the assistant stands on the right.

We use an optical guided trocar for placement of the camera port at the paramedian region above and lateral

to the umbilicus. A 10mm port is used for the camera. If the falciform ligament is bulky and redundant, we use a percutaneously placed and laparoscopically guided suspension suture. Further four 5mm ports are placed; 2 ports are on the left and one on the right side of the abdomen and one epigastric port (Figure 1).

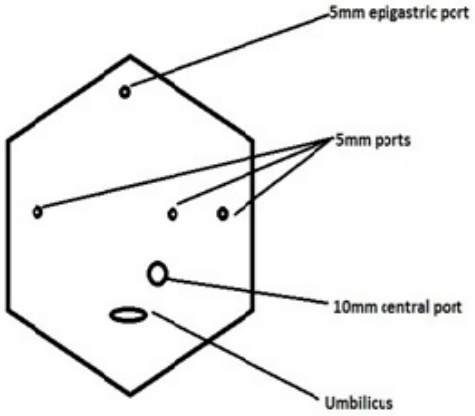

Figure 1. Laparosopic port sites at Nissen fundoplication

We use an improvised technique to retract the liver utilising a laparoscopic needle holder through the epigastric port. The left lobe of the liver is retracted and held up with the sheath of the needle holder and the jaw of the needle holder is used to pinch the diaphragm. Further, the pars flaccida is divided using an ultrasonic shear (Harmonic Scalpel, Ethicon endosurgery) and the right crus of the diaphragm is defined. The oesophagus is then mobilized along the crus. Retro-oesophageal dissection is done lifting the posterior vagus nerve along with the oesophagus, up to the lateral border of left crus and a tunnel is made between the posterior to the oesophagus. The vagus nerve is protected which is retracted superiorly with the oesophagus. The fundus of the stomach is mobilized along the greater curvature of the stomach dividing the short gastric vessels with the Harmonic scalpel.

The crural defect is then sutured using 2/0 silk sutures. The fundus is pulled behind the GOJ and the fundal wrap is formed with 2/0 silk sutures. We perform a 360^0 degree wrap. There are other centres which perform 270^0 wraps and Dor wraps.

The new fundal wrap and the tightness of the GOJ is checked using on-table endoscopy. Though the wrap can be made on a bougie to prevent narrowing, we do not use this technique.

Where there is a short oesophagus, the thoracic oesophagus has to be mobilized and pulled down prior to forming the wrap. In addition, there are additional procedures to lengthen the GOJ. Where there is a large hiatus hernia the repair can be augmented by a mesh.

Post-operative period

Patient is then managed with anti-emetics and pureed food for 2 days and gradually introduced to more solid food.

Patients do complain of "tightness" on swallowing but with pre-operative counselling and reassurance that this feeling will disappear as time progresses, the patient usually overcomes this fear. Early post-operative symptoms include abdominal discomfort and fullness, mild dysphagia, and post prandial discomfort. These are mainly due to swelling around the fundus and GOJ and usually resolve in 2-6 weeks. Post-surgical pneumothorax and surrounding structural damage to the spleen or vagus nerve are very rare.

Dysphagia lasting more than 12 weeks will require further evaluation. About 5-10% of patients who undergo Nissen fundoplication will require re-do surgery.

Conclusion

Laparoscopic Nissen Fundoplication is effective for carefully selected patients with severe GORD who are refractory to medical treatment. When performed by an experienced surgeon in appropriately selected patients laparoscopic anti-reflux surgery is cost effective than life long medical treatment. However, there is no evidence that laparoscopic fundoplication reverses the metaplasia in Barrett oesophagus. Furthermore there is no evidence to suggest that fundoplication reduces the incidence of adenocarcinoma in patients with Barrett oesophagus.

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