Gastroesophageal reflux disease (GERD) is a set of signs and symptoms and changes resulting from pathological backward flow of gastric or intestinal contents to the esophagus. Reflux of gastric contents occurs periodically in all people during a 24-hour period. Therefore physiological reflux of gastric contents that does not cause any complaints or histopathological changes in the esophagus should be differentiated from gastroesophageal reflux disease that results in subjective complaints or its complications confirmed by diagnostic methods. Prevalence of gastroesophageal reflux disease is difficult to estimate, however it is believed to occur in 0.35 to 2% of the whole population (1).

Before a decision is taken to proceed with surgical treatment, detailed diagnostic work-up of causes of pathological gastroesophageal reflux is required and the strategy of surgical treatment should be based on three basic principles: alleviation of typical subjective complaints, healing and prevention of recurrences of reflux injury of the esophageal mucosa and prevention of possible complications of the long standing disease such as bleeding, ulceration and esophageal stricture, aspiration pneumonia and intestinal metaplasia.

Approach of surgeons to pathogenesis of esophageal ulcerations changed since Quincke reported for the first time three cases of this condition in 1879. Quincke concluded that similar macroscopic nature of esophageal ulcers and gastric ulcers and close anatomical proximity indicated that reflux of gastric juice into the esophagus could be the cause of “ulcer ex digestion”. In 1906 Tileston presented a similar concept, on the basis of examination of 41 cases of esophageal ulcerations, supporting his concept with Albert’s publications from 1839. In 1946 Allison presented a new disease entity – “peptic oesophagitis”. He reported it on the basis of clinical signs and symptoms and radiographic picture. He concluded that abnormal reflux of gastric juice through abnormal cardia is a pathological factor of the new disease. However Barret in 1950 suggested a new term for the disease reported by Allison – reflux esophagitis that was to reflect relationship between esophagitis and the disease etiological factor. A paper published in 1988 allowed us to understand a role of individual anatomical factors of so called anti-reflux mechanism, protecting against pathological gastroesophageal reflux. Further progress in the understanding of gastroesophageal reflux was associated with development of diagnostic methods used to diagnose gastroesophageal reflux and its consequences. In 1926 Robin and Jankelson were the first to demonstrate gastroesophageal reflux using a radiological study (2-8).

Detailed assessment of gastroesophageal reflux and development of knowledge about pathogenesis of reflux esophagitis facilitated progress in implementation of new methods of surgical treatment of this disease. In 1919 Soeresi was the first to perform an operation
of a sliding hiatus hernia due to complaints related to gastroesophageal reflux, from abdominal approach. The assumption that a sliding hiatal hernia is the main cause of a principal clinical symptom of gastroesophageal reflux, i.e. heartburn, persisted until the early 1950’s. Therefore, restoration of primary anatomical conditions was considered sufficient to cure the disease. Only discovery of the key role of the lower esophageal sphincter (LES) resulted in development of the first rational method of surgical treatment – fundoplication procedure (in 1956 by Rudolf Nissen).

The primary Nissen procedure involved formation of 2 wide folds from the gastric fundus, surrounding the esophagus with these folds and approximation of “free” margins at the front of the esophagus with 4-5 sutures. Dissection and demonstration of gastroesophageal region and opening of the omental sac was required during the procedure. It resulted in an extensive injury of the vagus nerve branches, in particular of the right trunk of the vagus nerve, resulting in serious abnormalities of gastric motility (9, 10).

Therefore efforts of both Nissen and other surgeons focused on development of a technique that would result in sparing of the vagus nerve branches. So called “anterior wall technique”, prepared by Rosetti and Hell, fulfilled these requirements. It involved creation of a cuff from the anterior gastric wall and surrounding of the whole esophageal circumference with it. However, this technique usually required extensive mobilization and ligation of the short gastric vessels (11).

Currently the most commonly used modification of complete Nissan fundoplication is so called technique of a short, soft cuff, implemented by Donahue and Bobeck in 1977. This procedure involves dissection of the gastric fundus and the region of gastroesophageal junction and surrounding it with a short (2-2.5 cm) cuff, with preservation of the vagus nerve trunks. This resulted in decrease of incidence of postoperative abnormalities including dysphagia and gas distension syndrome (12).


Apart from complete fundoplication, partial fundoplication is also used, involving surrounding of an anterior (Dora procedure) or posterior (Toupet procedure) part of the esophageal circumference with a cuff created from the gastric fundus. Belsey-Mark IV procedure, from thoracic approach, is another variation of partial fundoplication. Some surgeons consider partial fundoplication procedures particularly useful in patients with reduced esophageal motility. In 1991 Dellemagne was the first to perform a surgical procedure in the treatment of gastroesophageal reflux disease using a laparoscopic approach (21).

This approach was later considered “gold standard” in anti-reflux surgical procedures. Marked reduction of surgical trauma and significant reduction of duration of hospitalization related to the nature of this approach, contributed to significant interest of surgeons in the treatment of gastroesophageal disease, in particular in patients with coexisting cardiovascular disorders, in children and in patients with genetic defects (1, 22-31).

Currently complete (360°) fundoplication with creation of a loose cuff around the abdominal part of the esophagus (so called floppy Nissen) is the most commonly performed procedure. This type of procedure results in the best results in patients with GERD (32-42). Currently, subsequent gastropexy is also recommended to reduce postoperative complaints and incidence of sliding hiatal hernia (43). Both Nissen and Toupet procedures are considered equally effective in the surgical treatment of GERD (44).

Current indications for surgical treatment of gastroesophageal reflux disease include: ineffective medical treatment, complications of the disease including erosions, ulceration, esophageal stricture, reflux esophagitis that results in massive gastrointestinal bleeding in 6-7% of patients, severe asthma (in 45-65% of cases related to gastroesophageal reflux disease) as well as recurrent aspiration pneumonia. One should also remember about a precursor lesion, Barret’s esophagus, that may evolve into esophageal adenocarcinoma irrespective of its length. An estimated incidence of Barret’s esophagus in the population of patients with gastroesophageal reflux is 5-15%. When patients are qualified to surgical treatment of gastroesophageal reflux disease, it must be taken into account that in patients
with high grade dysplasia the risk of adenocarcinoma is as high as 25%. The risk of Barret’s esophagus increases with frequent gastroesophageal reflux (45-51).

In conclusion, surgical treatment of gastroesophageal reflux disease conforms to current trends favoring low invasive surgical procedures that significantly reduce duration of hospitalization and therefore more rapid return to full life and professional activity that results in better quality of life after procedures of this type. When proper qualification criteria for surgical treatment are followed, a surgical procedure results in alleviation of typical complaints, effective protection against reflux of gastric contents into the esophagus and prevention of reflux-related complications.

REFERENCES


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