Gastroesophageal reflux disease – clinical practice guidelines

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Introduction

Guidelines for diagnosis and treatment of gastroesophageal reflux disease (GERD) were published by the American College of Gastroenterology (ACG) in 1995 and updated in 1999. Two years later another document was printed, signed by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). This document defined indications for surgical treatment of GERD. Until now, there have been no clear criteria delineated by indigenous authors, especially in the specialty of gastroenterological surgery. Existent guidelines by the Polish Gastroenterological Society from 2005 do not fully cover surgical treatment issues.

Already in 1919 A. L. Soresi had written: "The possibility of gastroesophageal reflux disease remains an object of interest of both the gastroenterologist and the surgeon; however, when the diagnosis is established, the patient belongs to the surgeon". This discordance in surgeons' and gastroenterologists' attitude to GERD demands new guidelines.

Gastroesophageal reflux disease definition

A new definition of GERD was established in the last decade. Jamieson and Duranceau's definition presumed both physiological and pathological reflux – the latter called reflux disease, with or without morphological changes in oesophageal mucosa (Figure 1). In 2006 at the Montreal conference an evidence-based definition of GERD was established. The global consensus on GERD definition aimed at simplification of the diagnostic and therapeutic process, scientific cooperation, and giving a chance for comparative studies for the benefit of patients, doctors, national health organizations and world insurance companies.

Finally GERD was defined as: "a chronic condition in which gastric content is regurgitated into the oesophagus and causes bothersome symptoms and/or complications" (Figure 2).

Diagnosis of reflux disease

After analysis of the literature and available meta-analyses of numerous clinical trials, the following rules in assessment of each patient with suspected GERD seem justified:

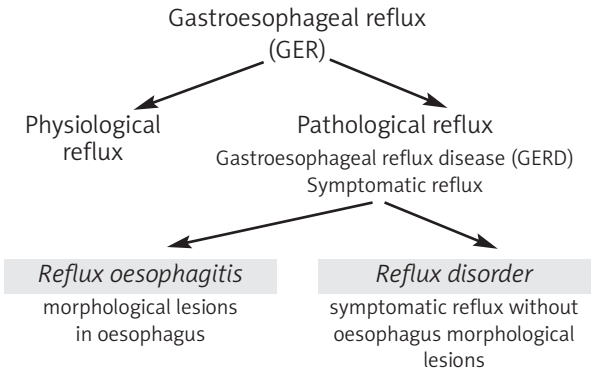

Figure 1. Classification of reflux disease according to Jamieson and Duranceau. Jamieson, Duranceau eds. Gastroesophageal reflux. Saunders 1988

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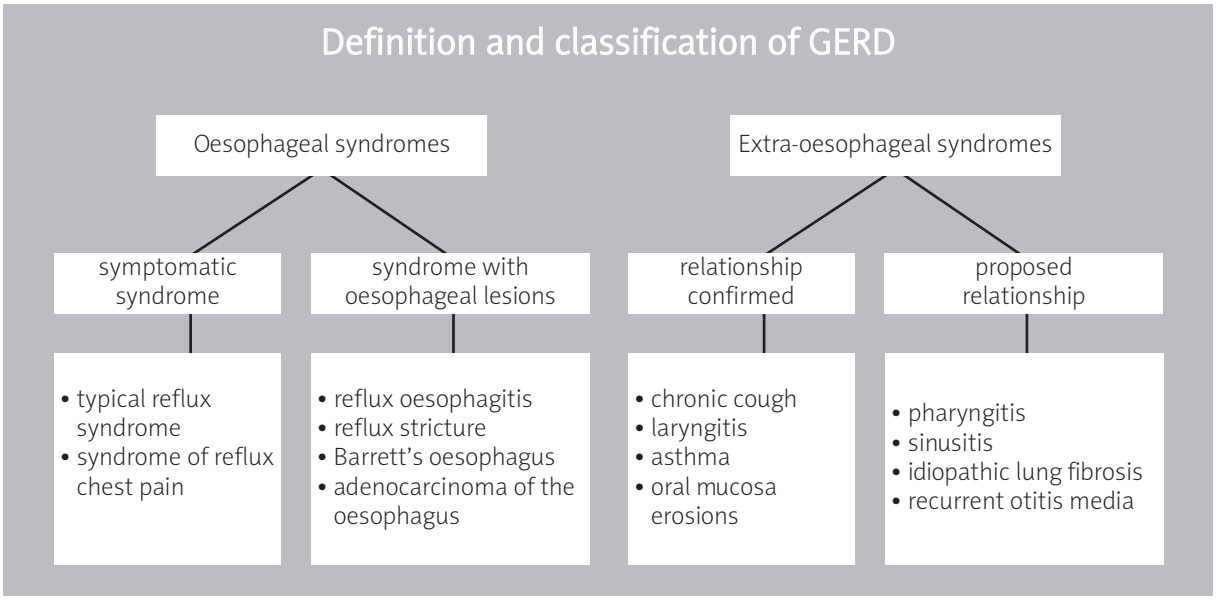

Figure 2. Reflux disease classification. The overall definition of GERD, and its constituent syndromes (Montreal classification). Am J Gastroenterol 2006; 101: 1900-1920

1) taking of detailed medical history,
2) physical examination,
3) additional diagnostic tests.

After detailed anamnesis, a further diagnostic and therapeutic plan can be devised. It can be simplified into a few points:
1) reflux disease as a cause of subjective discomfort,
2) cause of reflux disease in a specific patient,
3) consequences of pathological gastroesophageal reflux,
4) identification of patients at risk of complications typical for GERD,
5) identification of patients at risk of respiratory complications in the course of GERD,
6) risk factors affecting final result of treatment,
7) identification and qualification of patients for optimal (conservative or surgical) treatment modality.

Diagnostic guideline I: empirical therapy

- Initiation of treatment with proton pump inhibitor (PPI) at therapeutic dose.
- If symptoms are still present, further diagnostic steps should be done.

When typical symptoms of reflux disease are present (heartburn, regurgitation or both), often immediately after a large, fatty meal, and no risk of disease complications or Barrett's oesophagus is suspected, pharmacological treatment can be attempted. A positive response with resolution of symptoms can be confirmative of such symptom origin. Combination of symptoms with endoscopic findings is highly specific for GERD (97%). Endoscopy should be recommended prior to empirical therapy only when disease complications are suspected or when both patient and doctor believe it ought to be done. Further studies should be considered if there is no response to empirical therapy.

Likelihood of GERD complications is higher when alarm symptoms (dysphagia, no effect of empirical therapy) are present.

Diagnostic guideline II: endoscopic examination

Endoscopic examination – necessary:
- diagnostic endoscopy with biopsies for histology whenever inflammatory changes are present;
- determination of the stage of the disease according to one of the classifications:
  – Savary-Miller,
  – Los Angeles,
  – MUSE;
- whenever a diagnosis of Barrett's oesophagus is made, the patient is referred to the National

Barrett's Oesophagus Registry; treatment of Barrett's oesophagus is another issue.

Endoscopy is a technology which allows for thorough examination of the oesophagus and identification of patients with GERD or Barrett's oesophagus. To confirm Barrett's oesophagus, biopsy or brush cytology is a must. This test provides assessment of the magnitude of inflammatory changes in mucosal lesions. When substantial inflammation is present and Barrett's epithelium is suspected, biopsies should be done after initial pharmacological treatment to make sure severe inflammation will not be taken for dysplasia on microscopic evaluation.

Broad spectrum of macroscopic changes in reflux disease is an indication for application of classifications and grading systems of disease progression. This simplifies assessment when the patient changes the centre and allows the course of the disease to be followed. Los Angeles classification is most often recommended in oesophagitis. The next most popular one is the Savary-Miller scale in original or modified version (Table I). MUSE classification is less common. So-called alarming symptoms (body weight reduction, GI bleeding, dysphagia), substantial symptom intensity and ineffectiveness of pharmacological therapy are particular indications for endoscopy. For assessment of metaplasia, Prague C&M classification is applied most often. To properly assess metaplasia, certain conditions must be met:

- skill of endoscopic diagnosis of metaplasia,
- ability to identify squamocolumnar junction (Z line) on endoscopy,
- ability to identify high pressure zone (diaphragmatic impression/hhe) on endoscopy,
- endoscopic definition of C (circumferential) area and M (maximum) protrusion of glandular epithelium into the oesophagus, for instance C2, M5.

However, biopsy remains the basis for microscopic verification.

Diagnostic guideline III: radiological studies

Radiological examination – indicated – with double contrast:

- assessment of the size and type of hiatal diaphragmatic hernia,
- initial judgement of oesophageal contractility (limited availability of oesophageal manometry in Poland),
- shortened oesophagus diagnosis – qualification for Collis gastroplasty.

Double contrast examination in its active phase provides valuable information when endoscopy cannot be done. It allows one to assess morphology of the oesophagus, strictures, and the size of large diaphragmatic hernias. It is also a valuable indication for a surgeon planning surgical treatment in the future. Reduction of the hernia in upright position gives a better chance for a tension-free procedure with no need for

Table I. Classifications of oesophagitis: Los Angeles, Savary-Miller and modified Savary-Miller

Los Angeles	Savary-Miller	Modified Savary-Miller
A: at least one mucosa lesion < 5 mm long **B:** at least one mucosa lesion > 5 mm long, not affecting whole area between two neighbouring oesophageal mucosal folds **C:** at least one lesion of mucosa affecting whole area between two or more oesophageal mucosal folds, and less than 75% of oesophagus circumference **D:** lesion of mucosa affecting at least 75% of circumference of the oesophagus	**I:** one or more non-confluent mucosal lesions with erythema or exudate or superficial erosion **II:** erosive or exudative mucosal lesions confluent without covering the entire circumference of the oesophagus **III:** erosive and exudative lesions cover the whole oesophageal mucus membrane circumferentially and lead to inflammatory infiltration of the wall without stricture **IV:** appearance of chronic mucosal lesions (ulcer, fibrosis of the wall, stricture, short oesophagus, scarring with columnar epithelium)	**I:** single erosive or exudative lesion, oval or linear, taking only one longitudinal fold **II:** noncircular multiple erosions or exudative lesions taking more than one longitudinal fold, with or without confluence **III:** circular erosive or exudative lesion **IV:** chronic lesions: ulcer(s), stricture(s), or short oesophagus, isolated or associated with lesions of grades I, II, or III **V:** islands, finger-like forms or circumferential distribution of Barrett's epithelium isolated or associated with lesions of grades I to IV

Collins gastroplasty when shortening of the oesophagus is present. Spontaneous contrast regurgitation in upright position is a pathognomonic sign.

Diagnostic guideline IV: pH-metry/multi-channel gastroesophageal impedance with pH monitoring

pH-metry/multi-channel intraluminal gastroesophageal impedance and pH monitoring is indicated in:

- unsure diagnosis and qualification for surgery,
- presence of clinical symptoms of reflux disease without endoscopic lesions,
- need for diagnosis of non-acidic or mixed type reflux,
- presence of extra-oesophageal symptoms,
- control of conservative or operative treatment.

To confirm a chain of cause-and-effect relationship of inflammatory changes in the oesophagus, studies monitoring reflux of gastric content into the oesophagus are indicated, especially when surgery is planned. Many patients with documented acidic gastric content regurgitation do not present with oesophagitis. On the other hand, there are patients with significant lesions or pronounced symptoms without any proof of acidic regurgitation. Adequately treated patients with persistent symptoms fall into the latter group. These patients finally are candidates for multi-channel intraluminal impedance and pH monitoring. This test allows for physical determination of the number of reflux episodes per day and assessment of regurgitated gastric content acidity. This test also affords control of treatment results and can be performed during therapy with PPI or histamine H2 receptor inhibitors.

Diagnostic guideline V: oesophageal manometry

Oesophageal manometry – test recommended in dysphagia, when aforementioned studies have been completed:

- assessment of motor activity of the oesophagus and lower oesophageal sphincter (LES),
- confirmation or exclusion of primary oesophageal motor activity changes,
- diagnosis of achalasia, diffuse oesophageal spasm (DES) or nutcracker oesophagus.

Allows for precise pH-metric sensor placement (5 cm above upper margin of lower oesophageal sphincter), documents normal or aberrant peristalsis of the oesophagus and function of oesophageal sphincters. Propulsive function of the lower part of the oesophagus, length of its abdominal part and resting pressure of the lower oesophageal sphincter are all important information to a surgeon. Only these basic parameters give a chance for planning anti-reflux surgery. At present, high resolution manometry with intraluminal oesophageal impedance measurement is becoming more and more popular in pre-operative patient workup.

Gastroesophageal reflux disease pharmacotherapy

Detailed guidelines of pharmacotherapy were prepared and presented by the Working Group of the Polish Society of Gastroenterology (2005). A basis for any treatment is patients' will to cooperate. In many patients with GERD a decrease in magnitude of symptoms can be achieved with change of diet and lifestyle with small doses of anti-secretory agents. At the moment, PPI are recommended in two dosing schemes.

In the first regimen, therapy is begun with a single dose (10-20 mg) administered 20 min before breakfast. When there is no improvement, the single dose is doubled (20-40 mg), and when the problem persists, twice-daily dosage is introduced up to 80 mg per day in two fractionated doses. Administration of H2-inhibitor monotherapy is not recommended, as their efficacy is lower than PPI. In reasonable cases an additional night dose can be administered, reducing so-called nocturnal acidic regurgitation.

In the second regimen therapy is begun with high doses of PPI, which are reduced later to a dosage which allows for control of symptoms in a particular patient. It should be stressed that treatment ought to be tailored to each individual patient. Such regimens are described as step up and step down strategies. If surgical treatment is considered, and a patient has pronounced inflammatory lesions, pharmacotherapy is recommended as a first, safer choice with subsequent anti-reflux surgery.

Prokinetic agents, as aetiopathogenetically most reasonable, are not recommended either in GERD monotherapy or in combination with hyposecretory treatment. Commencing intensive treatment with high-dose PPI in patients with symptoms from the respiratory system potentially resulting from unconfirmed GERD should not be practised.

Surgical treatment

Indications for surgery concern only patients with well-documented reflux disease who:

1) did not improve in spite of intensive pharmacological therapy,
2) choose surgical treatment despite adequate pharmacological treatment, are young, have to constantly adhere to medical therapy even for the rest of their lives, which involves high expenses, or whose lifestyle excludes regular treatment,
3) develop reflux disease complications (Barrett's oesophagus, high grade oesophagitis),
4) have accompanying large hiatal hernia with complications such as bleeding or dysphagia,
5) have atypical symptoms (asthma, hoarse, chest pain, choking).

Operative treatment should not be considered only as an efficient alternative to pharmacotherapy, but should rather be seen as a method aimed at determining correction of the mechanical cause of reflux disease, with a satisfactory result achieved in 85-93% of patients. Guidelines for patient qualification for anti-reflux surgery, accepted by the American Society of Gastroenterology, are as follows:

- no effect of pharmacotherapy,
- patients requiring increasing dosage of therapy, with disease progression,
- no effect of maintenance therapy – development of complications (shortening of oesophagus, ulceration, motor impairment) despite pharmacotherapy,
- young patients, requiring long-term aggressive therapy,
- patient non-adherence, costs, fear of drug side effects,
- refusal of chronic pharmacotherapy,
- patients with stage 3-4 reflux oesophagitis with high risk of complications – mostly with non-acidic and mixed reflux,
- patients with low grade dysplasia, with efficient LES,
- patients with large sliding hiatus hernia resistant to pharmacological treatment,
- complicated reflux disease – strictures, ulcerations, Barrett's oesophagus,
- pulmonary complications – aspiration, repeated pneumonias, chronic laryngitis, and other extra-oesophageal symptoms.

When planning surgical treatment in reflux disease so-called absolute indications for operative treatment should also be considered:

- perforation of:
  – Barrett's ulcer,
  – gastic peptic ulcer within the thorax,
  – iatrogenic (instrumental);
- uncontrolled bleeding from GI tract:
  – Barrett's ulcer,
  – peptic ulcer of the stomach within the thorax;
- signs of bowel obstruction:
  – organic stricture type,
  – advanced peptic stricture;
- necrosis of the stomach:
  – organic stricture with signs of strangulation;
- aspiration to respiratory system resistant to therapy:
  – recurrent laryngitis or tracheitis,
  – recurrent bronchitis;
- signs of malignancy:
  – confirmed or suspected malignancy in Barrett's oesophagus.

Special attention must be paid to patients with Barrett's oesophagus due to the risk of adenocarcinoma development. Resection of the oesophagus ought to be considered if the patient presents with extensive lesions and high-grade dysplasia.

The goal of the surgical anti-reflux procedure is to stop gastric content regurgitation. Its superiority over pharmacotherapy has been proven in numerous controlled clinical studies. Anti-reflux surgery efficiently corrects a mechanically deficient existing valve and prevents temporary loss of sphincter function occurring at distension of the stomach. Years-long studies have shown such correction to alleviate heartburn and regurgitation symptoms, cure oesophagitis, inhibit disease progression and be effective 10 years after surgery. The efficacy of surgical treatment depends on the experience of the surgeon and adequate preoperative patient assessment.

Goals of surgical treatment are as follows:

1) obtain appropriate length of the abdominal part of the oesophagus from its mobilization to secure tension-free fundoplication, which would stay below the diaphragm,
2) prepare and mobilize the gastric fundus widely enough to make sure that the formed cuff would not rotate in the longitudinal axis and decrease the tension of fundoplication,
3) reduce diaphragmatic hiatus opening.

The gold standard for treatment of reflux disease is now laparoscopic fundoplication. This method has brought about a significant reduction of hospitalization and patient convalescence time. Full Nissen's or Nissen-Rosetti's fundoplication is recommended in patients with normal oesophageal motor function. In patients with significant dysfunction, non-complete posterior Toupet's fundoplication should be considered. Descriptions of anti-reflux procedures are widely available in the literature and identical for both open and laparoscopic access. Choice of technique depends on the surgeon's preferences and practicality; numerous modifications of the mentioned methods can be seen.

In some cases, such as coexistent chest pathology, or grade 3 or 4 incarcerated diaphragmatic hiatus hernia, the procedure can be completed through thoracotomy, yet it is not recommended access.

When short oesophagus is found or when there is significant tension after reducing reconstructed cardia into the abdominal cavity, the Collis procedure with fundoplication ought to be done.

Endoscopic treatment

As a method with expected high efficacy and low complication rate, endoscopic treatment is gaining increasing popularity and is a subject of meticulous assessment of clinical efficiency. At the moment, only two methods are accepted by FDA: Stretta and EsophyX™. Recommendations for biopolymers have been withdrawn due to the substantial complication rate. EsophyX™ is a minimally invasive method of reflux disease treatment, and has recently been approved in the European Union for endoscopic fundoplication. The Stretta method uses radiofrequency energy on the LES and the subcardial area. This results in an increase of LES tension and muscular layer hypertrophy and decreases the number of transient sphincter relaxations. It is the only method with efficacy confirmed with randomized studies. Radiofrequency is also used for Barrett's epithelium ablation with Halo 360 and Halo 90 apparatus. More traditional measures, such as endoscopic mucosectomy, argon or laser ablation, have been used for a much longer time. Any procedure of Barrett's epithelium removal ought to be supplemented with surgical or endoscopic fundoplication.

Summary

Reflux disease is a serious problem of not only medical, but also economic significance. The costs of long-term pharmacological treatment are tremendous. Surgical treatment for the majority of these patients seems justified. Such therapy ought to be undertaken in a centre with the volume exceeding 50 anti-reflux procedures per year. The procedure performed by an experienced surgeon gives a chance for remission of symptoms for over 5 years in more than 90% of patients. Application of laparoscopic techniques has made this method of treatment much more attractive.

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