Heartburn

Basics

Heartburn describes the leading symptom of reflux (gastroesophageal reflux disease; GERD). Heartburn is the burning sensation, which starts in the upper abdomen and extends behind the breastbone (sternum) through the chest into the neck, mouth and ears. Typically heartburn occurs 30 min to 60 min after a meal. Heartburn affects 20% to 30% of the population in Europe, North America (Canada, USA) and Asian countries (China, Taiwan, Japan). Males and females are equally affected by heartburn (age: 30-40 years). Heartburn per se is not dangerous but it may be the marker for a premalignant Barrett’s esophagus. Therefore persons with heartburn are recommended to undergo gastroscopy for the examination of inflammation (esophagitis) and Barrett’s esophagus.

Causes

Reflux causes heartburn. Reflux is the consequence of the dysfunction of the anti reflux mechanism in the lower portion of the esophagus (lower esophageal sphincter; LES). Reflux of gastric content inflames the esophagus and attacks the nerves of the esophagus. As a consequence heartburn develops. The following factors weaken the anti reflux mechanism and provoke heartburn: food (too sweet, too often and too much), beverages (alcohol, fruit juices, carbonated drinks), obesity, cigarette smoking, supine body position and medications (nitro, sedative).
Heartburn Symptoms

Heartburn symptoms include the burning sensation behind the breastbone, in the chest, and ascending to the neck and ears.

Diagnosis and tests

Diagnosis and tests for heartburn include gastroscopy, esophageal manometry and esophageal reflux monitoring. The tests assess hiatal hernia, reflux inflammation and Barrett’s esophagus (gastroscopy), the dysfunction of the anti reflux mechanism (esophageal manometry), the amount of reflux and if reflux causes heartburn (esophageal reflux monitoring). Radiologic tests (barium swallow; videokinematography) assess the presence of hiatal hernia, esophageal diverticula (excavations of the esophagus) and consequences of reflux esophagitis (narrowing strictures, rings, webs).

Heartburn diagnosis: the cartoon depicts the principles of manometry and reflux monitoring.

Heartburn treatment

Heartburn treatment includes medical and surgical options. Here we inform you about medical treatment and anti reflux surgery (heartburn surgery, magnetic ring, fundoplication).

Contact us, we’d like to help you!

Basics

Reflux causes heartburn. The causes for reflux include gastric distention (overeating) and dysfunction of the anti reflux mechanism (lower esophageal sphincter). The stomach produces gastric acid. Therefore reflux contains acid and non-acid components. Conceptually the treatment options for reflux include (1)
modification of the eating behavior (what and how you eat, drink), (2) reduce the amount of acid reflux with medical therapy (proton pump inhibitor, antacids) and (3) the surgical repair of the anti reflux mechanism (anti reflux surgery, heartburn surgery). There should be no heartburn treatment without gastroscopy. We perform gastroscopy to assess the presence of a premalignant Barrett’s esophagus (heartburn is an alarm symptom for esophageal cancer).

Gastric distention weakens the anti reflux mechanism within the lower portion of the esophagus (B). As a consequence reflux and heartburn occur (B). Over time permanent dilatation of the lower portion of the esophagus enlarges the hole within the diaphragm. Hiatal hernia develops (C).

**Self care**

Self care means to eliminate food and beverages, which provoke reflux and heartburn. For details see food and beverages. There should be no heartburn self care without gastroscopy. We conduct gastroscopy to exclude the cancer risk (Barrett’s esophagus).

**Food & beverages**

You are what you eat. Accordingly, specific food and beverages provoke reflux and heartburn: too sweet, too often, too much, too spicy; alcohol, juices, carbonated drinks, cigarette smoking. In addition medications, which weaken the anti reflux mechanism (lower esophageal sphincter) favor reflux and heartburn (nitro, sedatives and sleeping pills). Therefore, elimination of the above listed food, beverages and pills contributes to reduce reflux and heartburn.

**Medical treatment & heartburn relief**

Medical treatment either (1) neutralizes the gastric acid (antacid) or (2) blocks the gastric acid secretion (histamine-2 blocker, H-2 blocker; proton pump inhibitor, PPI). Administration of antacids, H2 blocker
and PPI reduces the acid reflux and causes heartburn relief. PPI is the most potent drug to reduce the acid reflux, when compared to antacids and H2 blocker. Medical treatment with PPI should be started with twice daily administration of the highest dose (2x 40 mg p.o. daily). Thereafter therapy follows the dose response. Initially medical treatment causes relief of heartburn in 80% of the cases. However, over the time the response to medical treatment decreases towards 50%. The combined bedtime administration of H2-blocker and PPI causes relief of nocturnal acid reflux and heartburn (sleep disturbance). However, over time this response gets lost and alternative treatment options should be considered (anti reflux surgery, heartburn surgery).

There should be no medical heartburn treatment without gastroscopy for the exclusion of cancer risk (Barrett’s esophagus).

**Anti Reflux Surgery (heartburn surgery)**

Anti reflux surgery is performed as a minimally invasive laparoscopic procedure. By the creation of a novel anti reflux mechanism surgery stops reflux and mediates heartburn relief. Here we inform you about the novel magnetic ring operation and the fundoplication.

**Basics**

Anti reflux surgery (heartburn surgery) is minimal invasive and includes the magnetic ring operation and the fundoplication (partial, total). Reflux and heartburn occur as a consequence of the dysfunction of the anti reflux mechanism in the lower portion of the esophagus (the lower esophageal sphincter; LES). Anti reflux surgery augments the anti reflux mechanism by wrapping a magnetic ring (Linx, Torax®) or the gastric fundus (fundoplication) around the lower portion of the esophagus. In addition surgery repairs the hiatal hernia. Surgery is conducted as a minimal invasive laparoscopic procedure and lasts 20 min (magnetic ring) or 60 min – 90 min (fundoplication). The mandatory tests before anti reflux surgery (heartburn surgery) include (1) gastroscopy, (2) esophageal manometry, (3) esophageal reflux monitoring. There should be no anti reflux surgery without these tests.

**Magnetic ring (LinX, Torax®)**

The magnetic ring operation represents a novel and highly effective minimal invasive anti reflux surgery against heartburn. During a 20 min to 30 min laparoscopic operation a ring containing magnetic titanium beads is placed around the lower end of the esophagus (Linx System, Torax Medical, USA). At rest, the magnetic attraction closes the ring around the esophagus and prevents reflux. Upon eating the ring dilates due to swallowing forces and allows the passage of food. During the operation the surgeon also repairs the hiatal hernia. The magnetic sphincter should be offered to persons with reflux, heartburn and a small hiatal hernia (Prognosis: normalization of esophageal acid exposure and absence of heartburn without medical treatment in 85% to 90% of the patients after 3 years.

**Advantage vs. fundoplication**: shorter operation time, no slipping. Ring can be removed any time.

**Disadvantage**: magnetic resonance tomography (MRT) is not allowed, alternative: computed tomography scan.
Magnetic sphincter: the ring works by magnetic attraction of the magnetic titanium beads.

The magnetic ring is placed around the lower end of the esophagus and closes the anti reflux mechanism. Consequence: reflux and heartburn stop. During eating the ring dilates due to swallowing forces and allows the passage of food.

**Fundoplication**

Reflux and heartburn result from the impaired function of the anti reflux mechanism (the lower esophageal sphincter; LES). Reflux associates with hiatal hernia of the diaphragm. During fundoplication the surgeon reduces the hiatal hernia and wraps the fundus (proximal part of the stomach) around the
lower end of the esophagus. This creates a new anti reflux mechanism. The fundoplication is conducted laparoscopically as a minimally invasive procedure (60 min to 90 min operation time; 1-2 days hospital stay). During laparoscopic fundoplication the fundus is wrapped around the entire circumference of the esophagus (Nissen fundoplication), the dorsal 270° of the circumference of the esophagus (Toupet fundoplication; dorsal partial fundoplication) or the anterior aspect of the esophagus (Dor fundoplication; anterior partial fundoplication). Nissen and Toupet fundoplication are equally effective to eliminate reflux and heartburn. Dor fundoplication is only used as anti reflux surgery during a laparoscopic Heller myotomy operation for the treatment for achalasia (inability to swallow). When compared to Nissen and Toupet fundoplication, the Dor fundoplication is significantly less effective to restore the function of the anti reflux mechanism. Therefore we do not recommend Dor fundoplication for the treatment of reflux and heartburn.

**Prognosis:** when conducted in experienced centers, fundoplication works for 10 years in 80% to 90% of the cases. Slipping and dislocation of the fundic wrap may occur in 10% to 20% of the cases. In 5% to 10% of the cases a reoperation may be necessary over the time (10 years).

**Side effects:** During the first 2-4 weeks after anti reflux surgery gas bloat and dysphagia (swallowing difficulties) are more frequent after Nissen fundoplication, when compared to Toupet fundoplication. Thereafter these symptoms vanish and both Nissen and Toupet fundoplication are equally effective to eliminate reflux and heartburn.

*Schematic drawing of Nissen fundoplication: the fundus of the stomach is wrapped around the lower end of the esophagus to create a new anti reflux mechanism: reflux and heartburn stop. During the operation the size of the hiatal hernia is reduced. During the mobilization of the fundus the surgeon dissects the vessels between the fundus and the spleen.*
Different types of anti reflux surgery (fundoplication). The fundus is wrapped around the entire circumference of the esophagus (Nissen fundoplication), the dorsal 270° of the circumference of the esophagus (Toupet fundoplication; dorsal partial fundoplication) or the anterior aspect of the esophagus (Dor fundoplication; anterior partial fundoplication). Nissen and Toupet fundoplication are equally effective to eliminate reflux and heartburn. Dor fundoplication is less effective to stop reflux. Dor fundoplication is only used as anti reflux procedure during Heller myotomy operation for the treatment of achalasia.

Heartburn prevention

Heartburn prevention includes life style modification, change of the eating behavior and medical treatment. For heartburn prevention change your life style: avoid over eating (large meals) and the consumption of food and beverages, which cause reflux and heartburn (see above food and beverages). Avoid sweeties, alcohol, carbonated drinks, cocktails; cigarette smoking; sphincter relaxing medications (nitro, sedatives). Avoid a late meal before bed time, do not lie down immediately after a meal (>60 min). If you have heartburn you should undergo gastroscopy for the exclusion of Barrett’s esophagus and cancer. If nonsurgical heartburn prevention fails surgical treatment should be considered (magnetic ring, fundoplication).

Self test

Avoid large, sweet meals, avoid carbonated beverages, alcohol, juices and cigarette smoking. Undergo a medical treatment with proton pump inhibitor (PPI). If these measures relief heartburn, this proofs that you in fact have reflux (gastroesophageal reflux, GERD). We recommend to see us to undergo gastroscopy (exclusion of cancer risk), esophageal manometry and esophageal reflux monitoring.

Expert opinion

Sebastian Schoppmann (Surgeon, Vienna):
Heartburn impairs the life quality and productivity. In addition it may be associated with Barrett’s esophagus and cancer risk. Therefore the treatment aims to normalize the life quality and to prevent cancer development. When medical therapy fails we should go for anti reflux surgery. Early cases profit from the ring operation. Advanced reflux requires fundoplication. Nowadays these operations are minimal invasive laparoscopic procedures. In experienced hands these operations provide excellent results.

Johannes Lenglinger (Physiologist, Vienna):

Heartburn is the main reflux symptom. Diagnosis includes gastroscopy, esophageal manometry and esophageal reflux monitoring. The results of the test help to tailor the treatment. We recommend a first line treatment with proton pump inhibitor (PPI). If PPI therapy fails to provide adequate symptom relief we should consider surgical options.

Martin Riegler (Surgeon, Vienna):

Most importantly heartburn may mask Barrett’s esophagus and cancer risk. Therefore two things are to be considered: first we have to actively treat heartburn with the administration of proton pump inhibitor (PPI, 2 x 40 mg daily). Second, we have to exclude cancer risk. Therefore we offer gastroscopy. During the test we obtain biopsies (tissue samples). The pathologist examines these samples under microscope. 4-5 days after the gastroscopy we can report the result of the microscopic examination. For Barrett’s esophagus we offer the immediate elimination by radiofrequency ablation. In the absence of Barrett’s esophagus we treat heartburn. If PPI therapy fails we consider anti reflux surgery.

Literature