

Severe Intermittent Dysphagia is not a Contraindication for Total Nissen Fundoplication

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ABSTRACT

Aim: To study the effect of total Nissen fundoplication on severe intermittent esophageal dysphagia according to a hiatal hernia.

Methods: Twenty-three consecutive patients (12 men, 11 women, median age 43 yrs) with severe intermittent dysphagia and with hiatal hernia verified by endoscopy were included in the study. They were investigated with esophageal high-resolution manometry (HRM)-, and 24-hr pH- monitoring prior to hiatal hernia repair and at follow-up 6 months after surgery. On both test occasions, the patients were asked to fill in a questionnaire comprising 17 questions on esophageal and chest symptoms (severity grades 0-3).

Results: A hiatal hernia was recorded via HRM in all 23 patients prior to surgery and in no one at follow-up. Prior to surgery, all patients had either severe no stenotic dysphagia or frequent retention symptoms in the chest while eating. These two mechanical problems were relieved by surgery ($p < 0.0001$). Motility disturbances in the distal esophagus were recorded in 35 % of patients prior to surgery, but in no one at follow-up. The median total reflux time prior to surgery was 2.2 % (range 0.2 – 36.5 %) and at follow-up 0 % (0 – 0.3 %). Five patients had no pathological gastro-esophageal reflux prior to surgery.

Conclusion: Severe intermittent esophageal dysphagia in hiatal hernia patients can be successfully treated with total Nissen fundoplication, and this should be a strong indication for hiatal hernia surgery even in the absence of pathological gastro-esophageal reflux.

Keywords

Nissen fundoplication, Hiatal hernia, Pathological gastroesophageal reflux.

Introduction

In most studies on hiatal hernia, pathological gastroesophageal reflux has been the main indication for surgical repair. With the introduction of esophageal manometry in the 1970s, esophageal dysmotility was considered a contraindication for total Nissen fundoplication. The recommendation was to perform a partial

fundoplication if operation was considered. Esophageal dysphagia has not been recognized as a problem in patients with hiatal hernia if an esophageal stricture has been excluded. This study aimed to assess the effect of total Nissen fundoplication on severe nonstenotic esophageal dysphagia regardless of whether gastroesophageal reflux problems exist. To this end, 23 adult patients with a hiatal hernia, verified by endoscopy, and severe nonstenotic dysphagia or esophageal retention problems were investigated using a validated symptom questionnaire [1,2], high resolution manometry (HRM), and 24-hr esophageal pH-monitoring prior to and six months after hiatal hernia repair.

Material and methods

From a consecutive group of 160 adult patients (median age 48yr, range 15-74yr) with a hiatal hernia determined by endoscopy who underwent total Nissen fundoplication, twenty-three adult patients (12 men, 11 women, median age 43yr, range 15-69yr) with severe nonstenotic dysphagia as their main symptom were included in the study. Before inclusion in the study, all 23 patients had been treated with a proton pump inhibitor (PPI) for at least three months without any effect on their dysphagia problems. PPI medication was withdrawn for 10 days before performing manometry and 24-hr esophageal pH- monitoring.

Surgery included a floppy 360-degree Nissen fundoplication with crural repair [3]. During surgery, a 30-French tube was placed in the esophago-gastric region to prevent too tight crural repair. Laparoscopic surgery was performed in ten patients, and open surgery was performed in twelve patients. In one patient laparoscopic surgery was converted to open surgery.

Manometry- All patients underwent HRM (ManoScan 360 A-100, ManoView analysis software version, 2.0.1 from Sierra Scientific Instruments Inc, Los Angeles, CA) [4,5] prior to surgery and at follow-up six weeks after the hiatal hernia repair. The HRM catheter was passed nasally and positioned to take recordings simultaneously at points every cm from the hypopharynx, through the esophagus, to the stomach. The catheter was calibrated outside the patient before and immediately after the investigation using the thermal compensation option in the software. The investigation comprised ten swallows (time intervals of 30 sec) of a 10-ml water bolus in the supine position and was performed on an empty stomach. A hiatal hernia was defined as a distance between the LES (lower esophageal sphincter) and the hiatus canal of at least one cm. Dysmotility was defined in the HRM- program according to the Chicago classification [5] as a simultaneous pressure rise at two different intraesophageal locations 4 cm apart following the swallowing of a water bolus.

Twenty-four-hour esophageal pH monitoring

Patients who had proton pump inhibitors (PPI) were asked to withdraw their medication for 10 days before the 24-hr pH monitoring that started in the morning (after the manometry examination), and lasted 24 hr. An antimony pH probe was placed 5 cm above the upper end of LES. The patients were asked to refrain from acid drinks during the test day. The recordings were digitally analyzed. A value of pH < 4.0 during 4% of the test period was regarded as normal [6].

Questionnaire

The questionnaire comprised questions on the following symptoms: heartburn, burning chest pain, acid regurgitation, belching, swallowing difficulties, feeling of intermittent food retention in the chest, feeling of a lump in the throat, chest pain, epigastric pain, abdominal pain at mealtimes, unfitness already in the beginning of a meal, indisposition, flatulence, vomiting after a meal, cough, misdirected swallowing and hoarseness. The patients graded each symptom from 0 to 3 as follows: grade 0 (no symptom), grade 1

(mild symptom), grade 2 (moderate symptom), and grade 3 (severe symptom). The patients regarded dysphagia as “grade 1” when a feeling of food retention occurred less than once a week, as “grade 2” for more than once a week and “grade 3” for daily symptoms.

Statistical evaluation

Fisher’s exact test was used for comparison between data obtained prior to surgery and at follow-up. A p-value < 0.05 was regarded as significant. Symptom scores are given as median values and ranges.

Ethics consideration

The Ethics Committee approved this study for Human Research at the University Hospital of Linköping.

Results

A hiatus hernia was recorded via HRM in all 23 patients prior to surgery (median length 3 cm, range 2 – 7 cm) and in no one at follow-up (Figure 1). Before surgery, all patients had either severe dysphagia or frequent retention symptoms in the chest during meals (Table 1). These two mechanical problems were significantly relieved after surgery (p< 0.001). Of the other 15 symptoms, highly significant relief at follow-up (p < 0.001) was declared for heartburn, burning chest pain, epigastric pain, acid regurgitation, belching, indisposition and misdirected swallowing (Table 1). The frequency of flatulence problems did not differ between the two occasions. Motility disturbances in the distal esophagus were recorded in 35 % of patients prior to surgery but in no one at follow-up. The median total reflux time prior to surgery was 2, 2 % (range 0, 2 – 36, 5 %). Five of these patients had normal 24-hr pH monitoring results. At follow-up, no pathological reflux was recorded (0 – 0, 3 %). There were no differences between men and women in any of the items.

Table 1: Frequency of symptoms before total Nissen fundoplication (TNF) and at follow-up 6 months after surgery in 23 patients. Number (N) of patients with symptoms, median symptom score (M) and ranges (in parenthesis), and p-values for comparison before and after surgery are given under follow-up. Not significant = n.s.

Symptom	Before TNF	Follow-up
Heartburn	N = 17 M = 3 (1-3)	N = 0 p< 0.0001
Burning chest pain	N = 8 M = 3 (2-3)	N = 0 p < 0.004
Acid regurgitation	N = 8 M = 3 (2-3)	N = 0 p < 0.004
Belching	N = 12 M = 3 (1-3)	N = 0 p< 0.0001
Swallowing difficulties	N = 23 M = 3 (2-3)	N = 0 p < 0.0001
Food retention	N = 20 M = 2 (1-3)	N = 1 p< 0.0001
Lump in the throat	N = 11 M = 3 (1-3)	N = 1 p< 0.002
Chest pain	N = 4 M = 2 (1-3)	N = 0 n.s.
Epigastric pain	N = 14 M = 2,5 (2-3)	N = 1 p< 0.0001
Pain at mealtimes	N = 3 M = 2 (1-3)	N = 0 n.s.
Surfeitness	N = 6 M = 2 (1-3)	N = 3 M = 1 (1-1) p< 0.05
Indisposition	N = 15 M = 3 (1-3)	N = 2 M = 1 (1-1) p< 0.0001
Flatulence	N = 10 M = 2 (1-3)	N = 12 M = 1 (1-2) n.s.
Vomiting	N = 3 M = 3 (2-3)	N = 0 n.s.
Cough	N = 5 M = 2 (1-3)	N = 1 n.s.
Misdirected swallowing	N = 15 M = 2 (1-3)	N = 0 p< 0.0001
Hoarseness	N = 3 M = 2 (1-3)	N = 0 n.s.

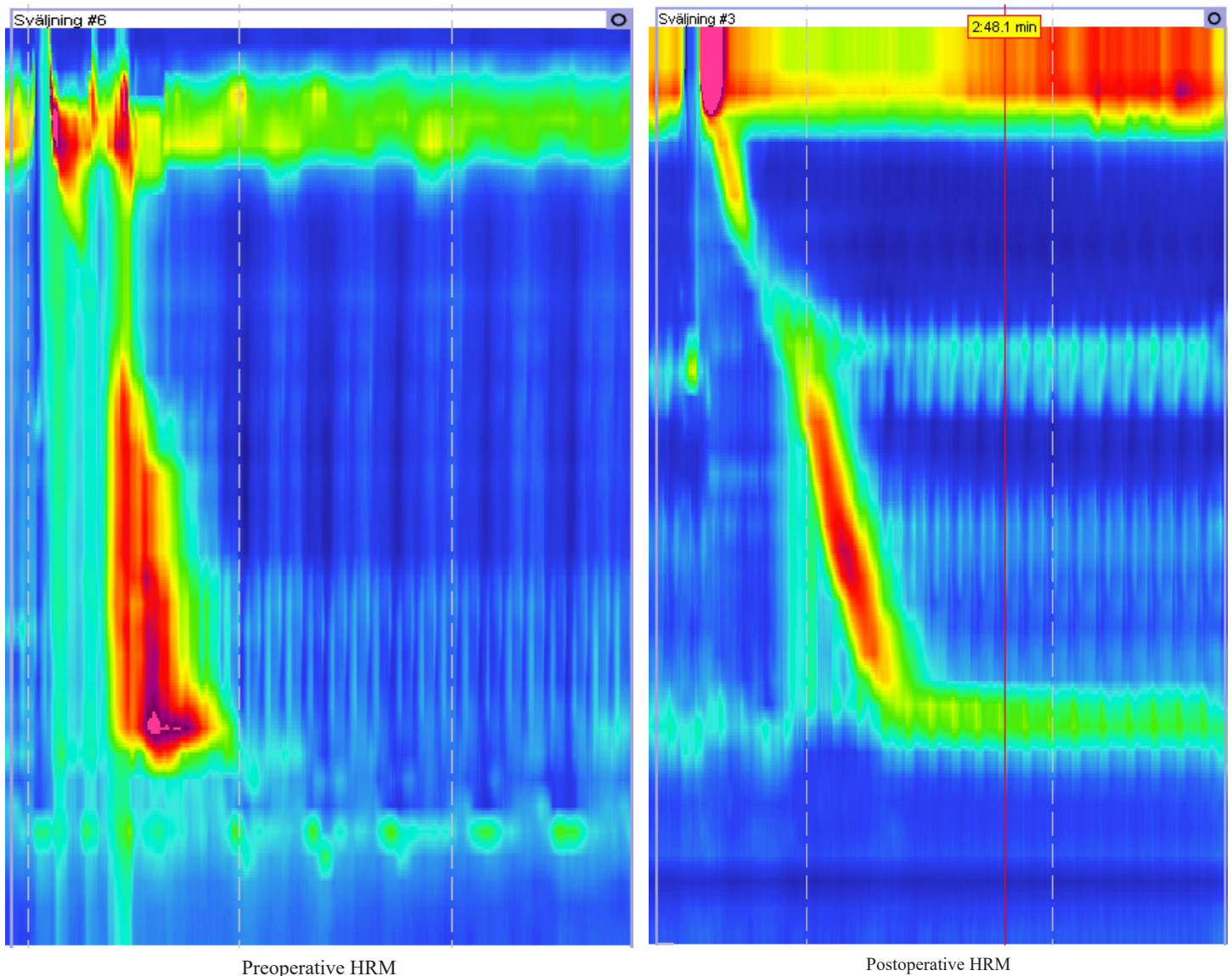


Figure 1: Pre- and postoperative HRM recordings of the gastroesophageal level and esophageal motility after swallowing a 10-ml water bolus in a patient with preoperative herniation (3 cm distance between LES and hiatus) and dysmotility (no progressive motility in the distal esophagus) that were relieved after surgery (no distance between LES and hiatus, progressive motility).

Discussion

This study shows that severe intermittent esophageal dysphagia in patients with a hiatus hernia, even in the absence of pathological gastro-esophageal reflux, can be successfully treated with total Nissen fundoplication. Severe intermittent esophageal dysphagia as the main indication for total Nissen fundoplication in patients with hiatus hernia has not been studied before to our knowledge. The presence of symptoms of esophageal dysphagia of intermittent character in patients with a hiatus hernia at times to have been regarded as a contraindication to fundoplication [7]. Only a few studies have directed attention to the effect of fundoplication on preoperative dysphagia in patients with hiatus hernia and gastro-esophageal reflux [8]. In a study from 1999 [9], patients with poor esophageal motility at manometry prior to surgery were excluded, but those with normal peristalsis and dysphagia underwent fundoplication, most of whom were relieved of their dysphagia

symptoms. In another study from 2001 [10], patients with hiatus hernia with poor esophageal motility at manometry underwent fundoplication. All of these patients had no dysphagia 6 weeks after the operation. However, dysphagia has been of great interest after hiatal hernia repair and has been regarded as an unwanted complication. Postoperative dysphagia seems to be dependent on a too tight crural repair, on too tight fundoplication or on whether the small gastric vessels have been divided or not.

The reason for esophageal dysphagia in patients with a hiatal hernia is apparently not connected with poor peristaltic activity in the distal esophagus. The finding of dysmotility in some patients probably has something to do with bolus retention in the distal part of the esophagus, which gives a false impression of dysmotility. As noted previously [11], one of the main reasons for dysphagia in hiatal hernia is shortening of the longitudinal esophageal muscle

when the hernia sac moves upwards in connection with swallowing, which will decrease wall compliance in the distal esophagus thereby impairing esophageal emptying. Furthermore, because contraction of the longitudinal esophageal muscle is associated with transient lower esophageal sphincter (LES) relaxation [12], a flaccid longitudinal muscle will impair LES opening and gastro-esophageal transit.

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