Post-fundoplication Symptoms

Do They Restrict the Success of Nissen Fundoplication?

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The post-fundoplication symptoms were assessed in 226 patients who had symptomatical improvement of gastroesophageal reflux after Nissen fundoplication. Follow-up range was from 3 to 12 years (average 5,6 years). Of these patients, 24% were totally asymptomatic. All had transient postoperative dysphagia which improved within an average of 3–5 months. Forty four per cent had changes in habits of swallowing; 38% had increased abdominal meteorism; 31% were unable to vomit and 19% unable to belch; 12% had pain in the upper left abdominal quadrant; and 10% had dyspepsia. These symptoms were uncomfortable in 26% and disturbing in 10%. Diverse causes can be responsible for these symptoms; mechanical (narrowing of the cardia, postoperative adherences), functional (motor troubles, denervation), and depending of the patients (alimentary habits). The high frequency of post-fundoplication symptoms restrict clearly the success of Nissen fundoplication.

ALTHOUGH NISSEN FUNDOPLICATION is a widely used procedure in the surgical treatment of gastroesophageal reflux, its detractors argue that the postoperative symptoms are a restriction to its success.[1-3] Gas-bloat and dysphagia are the most known post-fundoplication symptoms.[2,4] However, there is no objective data proceeding from large series with long follow-up about the occurrence of these symptoms.[3]

The aim of our study was to evaluate the late results of Nissen fundoplication by assessing the post-fundoplication symptoms and their possible causes.

Patients and Methods

Patients

Of 345 patients surgically treated by Nissen fundoplication for gastroesophageal reflux between 1970 and 1979, 226 were included in this study. For the purpose of this study the patients fulfilled the following conditions: they attended follow-up, they had symptomatic improvement of the gastroesophageal reflux, and they had no concomitant abdominal disease. One hundred thirty-one were men and 95 were women. Their age ranged from 25 to 72 years (average 52 years).

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Operations and Operative Technique

All of the operations were performed in the Department of Thoracic Surgery of the Central Hospital of Tampere by five surgeons. The surgeon who introduced the procedure in this hospital operated himself on 118 patients and taught the procedure to the other four surgeons. The procedure carried out was Nissen fundoplication with technical modifications described by Rossetti[5] through an abdominal approach. An additional hiatusplasty was carried out in all of the cases. A 18Fr tube was passed through the lumen of the esophagus for the confection of the fundoplication wrap. Pylorotomy was added to the procedure in 82 patients, cholecystectomy in 20, and vagotomy in 13. There was no major postoperative complication.

Follow-up

After operation, the patients were clinically controlled until improvement, usually for 3 to 6 months, after which the control was discontinued. During 1982, the patients attended follow-up and were all personally interviewed by one physician, who did not participate in their treatment. If necessary, radiological or endoscopical investigations were done to exclude the presence of pathological features. The average follow-up period was 5, 6 years with range from 3 to 12 years.

In this paper, the term post-fundoplication symptom is defined as a new symptom appearing immediately after the operation to the exclusion of symptoms caused by wound complications as wound pain or postoperative hernia.

Results

The frequency and intensity of the post-fundoplication symptoms are shown in Tables 1 and 2.

Increased abdominal meteorism. Eighty-seven patients (38 per cent) had increased abdominal meteorism, which was an uncomfortable symptom in 14 (6%) and disturbing in eight (3%). Sixty-three of them were able to belch. Increased abdominal meteorism was more frequent in younger (48% of patients under 40 years old) than in elder ones (26% of patients elder than 60 years). It was usually more disturbing in the immediate postoperative period and tended later to attenuate.

Postoperative dysphagia. All of the patients had a transient postoperative dysphagia, which lasted from some days to 1 year (average 3–5 months).

Changes in the habits of swallowing. One hundred patients (44%) had a slight degree of dysphagia for some food or drink such as fresh bread, apples, carrots, sour milk, and ice drinks. This was never disturbing for the patients but often required careful mastication and swallowing.

Inability to vomit and belch. Seventy patients (31%) were unable to vomit, while 62 (27%) were able. The others did not experience this need. Forty four patients (39%) were unable to belch and 120 (52%) were able to.

Abdominal pain in the upper left quadrant. Twenty eight patients (12%) complained of this pain related to the movements and the positions but not influenced by the ingestion of food. This pain was intense and disturbing in eight patients (4%) in which there were no objective findings at radiological or endoscopical investigations.

Dyspepsia. Twenty two patients (10%) had various dyspepsia. Of them, 15 complained of a sensation of fullness after eating and seven complained of epigastric burn after ingestion of some foods or drinks such as milk or coffee. This dyspepsia was usually prevented by a mild diet and thus was not disturbing.

Other symptoms. Diarrhea, dysphagia, dumping syndrome, or hiccups were experienced by 22 patients (10%). The adjunction to the Nissen repair of pylorotomy, vagotomy or cholecystectomy did not influence the incidence and the intensity of these postoperative symptoms.

TABLE 1. *Incidence of the Different Post Fundoplication Symptoms at the End of the Follow-up in 226 Patients in which Gastroesophageal Reflux was Improved*

Changes in the habits of swallowing	100	44%
Increased abdominal meteorism	87	38%
Inability to vomit	70	31%
Inability to belch	44	19%
Inability to vomit and belch	35	15%
Pain in upper left abdominal quadrant	26	12%
Dyspepsia	22	10%
Diarrhea	7	3%
Others	20	9%

Discussion

The term "gas-bloat syndrome" is commonly used to describe the side-effect symptoms following Nissen fundoplication. According to different reports, its incidence varies from 10% to 49%[2,6,7]. However, no precise definition of this term has been given and probably different types of symptoms have been described as "gas-bloat." For this reason, we prefer to use the term "increased abdominal meteorism." Three mechanisms have been proposed to explain the appearance of this symptom: tight fundoplication wrap leading to supercompetence of the cardia and inability to vomit and belch,[8] increased aerophagia contracted by the patient before the operation and persisting after it,[9] and surgical damage of the vagus nerves leading to gastric retention.[10]

Thirty eight percent of our patients had increased abdominal meteorism after surgery, which was occasionally disturbing in 3%. None of them had dysphagia, most of them were able to belch, and younger patients had this symptom twice as much as the elder ones. Many patients related its cause to the habit of eating quickly or irregularly. From these observations, we think that increased abdominal meteorism is not the consequence of inability to belch but rather the result of an increased aerophagia entertained by alimentary habits and probably also by psychological factors. The relative obstacle to the deglutition created by the fundoplication requiring more frequent acts of swallowing and thus swallowing of air, can also be a factor of persistence of this aerophagia. As emphasized by Skinner,[4] patients must be instructed about the air-swallowing problem and prevention or attenuation of this postoperative symptom depends on successful efforts done by the patients.

A transient dysphagia occurs after all antireflux procedures[9] but Nissen fundoplication carries the greatest risk of postoperative dysphagia.[4] The reasons advocated are tight fundoplication, postoperative oedema and denervation of the low esophagus by operative mobilization.[10] There are few data about the incidence and the duration of this normal postoperative dysphagia. In DeMeester and Johnson's study,[9] 86% of the patients experienced dysphagia which improved within 6 months. In our study, all of the patients had postoperative dysphagia which lasted from some days to 1 year. The use of a small calibre (18 Fr) intraesophageal sond during

TABLE 2. *Intensity of the Post Fundoplication Symptoms at the End of the Follow-Up in 226 Patients*

No symptoms	54	24%
Symptoms but no discomfort	91	40%
Symptoms causing discomfort	58	26%
Disturbing symptoms	23	10%

the confection of the fundoplication explains this high incidence and long duration. The use of at least 30 Fr sond, as recommended by several authors[4,6] will reduce the duration of this dysphagia.

After improvement of this marked dysphagia, almost half of our patients had a slight degree of dysphagia which persisted over the follow-up period. We described this symptom as a change in habit of swallowing and not as a dysphagia becuse it occurred only with specific kinds of food or drink. The cause can be purely mechanical, as narrowing of the cardia by tight fundoplication or hiatusplastia. A peristaltic trouble of the low-esophagus and cardial region can also be a cause, as suggested by its occurrence with drinks and especially ice drinks.

In our study, 31% of the patients were unable to vomit, 19% were unable to belch and only some of them were unable to do either. Patients who had frequent nausea, as those suffering from migraine, complained strongly of inability to vomit. Nobody complained of inability to belch.

Abdominal pain was the most disturbing postfundoplication in our patients. As there is no previous report of such painful syndrome, it is possible that it has been described as "gas-bloat" syndrome. Twenty two per cent of our patients had postoperative abdominal pains of three types. The first type was a pain of piercing or stretching nature, felt in the upper left abdominal quadrant, provoked of movements and positions of the body. We attribute its cause to stretching of the fundus or cardia by sutures or adherences. The second type of pain was a burning epigastric pain caused by ingestion of some kinds of foods. The third type was a painful sensation of post-prandial fullness and distension.

Vansant and Baker[11] found a much higher rate of postoperative symptoms when vagotomy was added to the antireflux procedure. Thus, surgical damage of the vagus nerves resulting in functional disorders of the upper abdominal tract is a possible cause of these dyspepsias. Postoperative adherences may also be responsible by causing a mechanical obstacle to gastric or duodenal emptying. However, it is possible that the dyspepsic syndrome is due to undiagnosed underlying disease, in which case the operation is not the direct cause of these symptoms but only a revealing factor. Nevertheless, gentle manipulation and careful operative technique recommended by Nissen et al.[12] in order to avoid damage of the vagus nerves is to be emphasized.

From this study, we conclude that the postoperative symptoms following Nissen fundoplication are frequent, various, occasionally disturbing, and last over a long follow-up period. For these reasons they restrict the success of this operation. However, the patients' faculty to adapt their alimentary habits to the new situation created by the operation is an important factor of their prevention or minimization. Details in operative technique such as "loose wrap" and care of vagus damage could also be a factor of prevention.

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