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A systematic review of Toupet and Nissen technique for treatment of GERD

Abstract

Background: Gastroesophageal reflux disease (GERD) is a highly prevalent condition that impacts patients' quality of life. When medical therapy fails, surgical treatment, particularly Nissen (NF) and Toupet fundoplication (TF), is indicated.

Aims: To compare the efficacy, complications, and outcomes of NF and TF in GERD treatment.

Methods: A systematic review was conducted in PubMed, Cochrane, SciELO, and LILACS (2002–2025). Randomized controlled trials and cohort studies comparing NF and TF with ≥12 months follow-up were included. Primary outcomes: postoperative dysphagia, reflux control. Secondary outcomes: PPI use, quality of life (QoL), reoperations.

Results: Nine studies (2,130 patients) were included. Both techniques showed similar efficacy in reflux control. NF resulted in higher lower esophageal sphincter pressure but increased early postoperative dysphagia. TF preserved esophageal motility better and had lower early dysphagia rates. Long-term PPI use, QoL, and patient satisfaction were comparable.

Conclusions: NF and TF are effective for GERD. NF increases sphincter pressure but with more dysphagia; TF offers better motility preservation and fewer side effects. Surgical choice should be individualized based on esophageal motility and patient characteristics.

Keywords: gastroesophageal reflux disease; nissen fundoplication; toupet fundoplication

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Abbreviations: GERD, gastroesophageal reflux disease; NF, nissen fundoplication; TF, Toupet Fundoplication; LES, lower esophageal sphincter; PPI, proton pump inhibitor; QoL, quality of life; RCT, randomized controlled trial; GIQLI, gastrointestinal quality of life index; GSRS, gastrointestinal symptom rating scale; SF-36, short form health survey

Introduction

Gastroesophageal reflux disease (GERD) is a chronic digestive condition characterized by the abnormal backflow of gastric contents into the esophagus, leading to symptoms such as heartburn, regurgitation, chest pain, and, in more severe cases, complications such as esophagitis, esophageal stricture, and Barrett's esophagus.[1,2] Additionally, extra-gastrointestinal complications may occur, including dental erosions, laryngitis, chronic cough, asthma, sinusitis, and idiopathic pulmonary fibrosis, highlighting the systemic nature of this condition.

The prevalence of GERD has been increasing globally, particularly in Western countries, and is currently considered one of the most common gastrointestinal disorders. It is estimated that the prevalence reaches approximately 20% of the population in countries such as the United States, with a progressive increase also observed in developing countries, possibly associated with the westernization of dietary habits and the rising rates of obesity.[3–5] Studies also report a significant impact of GERD on quality of life, increased healthcare costs, and higher incidence of complications such as Barrett's esophagus and esophageal adenocarcinoma.[6,7]

GERD primarily involves dysfunction and transient relaxations of the lower esophageal sphincter (LES), hiatal hernia, and increased intra-abdominal pressure, along with factors such as esophageal hypersensitivity and delayed gastric emptying.[8] Risk factors for this condition include age, obesity, and Western dietary habits.[3,5,9] Among the most commonly performed surgical procedures for GERD treatment are fundoplication techniques, which involve reconfiguring the gastric fundus to wrap it circumferentially or partially around the distal esophagus, creating an effective valvular mechanism that restores the anti-reflux barrier function.[10,11] The two main techniques are the Nissen total fundoplication and the Toupet posterior partial fundoplication.

Nissen fundoplication (NF), first described in 1956, consists of a 360° wrap of the distal esophagus with the gastric fundus, forming an anti-reflux valve that reinforces the LES.[12,13] This procedure can be performed via a laparoscopic approach, which is associated with lower morbidity rates, shorter hospital stays, and faster recovery.[14] As an alternative to the Nissen technique, Toupet posterior partial fundoplication (270°) was described in 1961 and is particularly indicated for patients with esophageal motility disorders or those at higher risk of postoperative dysphagia.[15,16] In this technique, the gastric fundus is partially wrapped around the posterior aspect of the esophagus, leaving the anterior aspect free. This approach aims to minimize side effects associated with total fundoplication, such as dysphagia and gas-bloat syndrome, while maintaining effective reflux control.[17] Manometric studies have demonstrated that posterior partial fundoplication preserves more physiological gastroesophageal junction dynamics while maintaining effective reflux control.[18]

Comparative studies between the Nissen and Toupet fundoplication techniques have shown similar results in terms of GERD symptom control. However, they differ in the frequency of adverse effects: the Nissen technique is more often associated with persistent dysphagia, whereas the Toupet technique tends to better preserve esophageal function.[19–22] These differences in outcomes make it

difficult to establish a definitive consensus on the superiority of one technique over the other, highlighting the need for individualized surgical approaches based on each patient's clinical and functional characteristics. The choice between techniques often depends on the surgeon's experience, the patient's clinical status, and the presence of functional abnormalities such as esophageal motility disorders, in which partial fundoplication may be preferable to reduce dysphagia symptoms.[23,24] Preoperative esophageal manometry thus becomes an essential tool for appropriately selecting the surgical technique.

Given the clinical relevance of GERD and the need to understand the technical aspects, advantages, and limitations of NF and TF, this study aims to conduct a systematic review of the literature regarding these two surgical approaches. The objective is to provide an updated comparative analysis, grounded in the available evidence, to support a better understanding of the indication criteria and outcomes associated with each technique.

Methods

This is a systematic literature review aiming to compare the Nissen and Toupet fundoplication techniques in the surgical treatment of gastroesophageal reflux disease (GERD), based on clinical evidence available in the literature.

Study type

This review considered studies that compared the Nissen and Toupet fundoplication techniques and their respective outcomes in adult patients diagnosed with GERD.

Inclusion criteria

Studies that met the following criteria were included:

i. Direct comparison between Nissen fundoplication and Toupet fundoplication;

ii. Randomized clinical trials (RCTs) or cohort studies;

iii. Population composed of adults (≥18 years) with a confirmed diagnosis of GERD;

iv. Minimum postoperative follow-up of 12 months;

v. Presentation of quantitative data related to at least one of the following outcomes: postoperative dysphagia, reflux control, continued use of PPIs, quality of life and satisfaction, and reoperations;

vi. Publications in Portuguese, English, or Spanish, with access to the full text.

Exclusion criteria

The following were excluded:

i. Studies with inadequate design;

ii. Studies with a pediatric population (age <18 years);

iii. Duplicate studies;

iv. Studies with insufficient or incomplete data, or that did not present relevant information for the outcomes of interest;

v. Studies without a direct comparison between Nissen fundoplication and Toupet fundoplication;

vi. Publications in languages other than Portuguese, English, or Spanish, or without access to the full text.

Search strategy

The search strategy was designed to identify studies that directly compared the Nissen and Toupet fundoplication techniques in the surgical treatment of gastroesophageal reflux disease (GERD). A systematic search was conducted in the PubMed/MEDLINE, Cochrane, SciELO, and LILACS databases, including publications from January 2002 to July 2025, in Portuguese, English, and Spanish. The strategy was developed using a combination of controlled descriptors (DeCS/MeSH) and free-text keywords, applying the Boolean operators AND and OR to refine the results. The search terms included: 'Nissen fundoplication', 'Toupet fundoplication', 'posterior partial fundoplication', 'posterior total fundoplication', 'laparoscopic Nissen', 'laparoscopic Toupet', 'laparoscopic fundoplication', 'gastroesophageal reflux disease', 'GERD', 'antireflux surgery', 'surgical treatment of GERD', 'fundoplication techniques', 'fundoplication outcomes', 'fundoplication comparison', 'Nissen versus Toupet', and their equivalents in the selected search languages.

Search expressions were adapted to the specifications of each database. In PubMed/MEDLINE, Medical Subject Headings (MeSH) terms were prioritized; in Cochrane, specific filters for systematic reviews and randomized controlled trials available on the platform were applied; while in SciELO and LILACS, Descritores em Ciências da Saúde (DeCS) and their respective translations were used. Filters for study type (randomized controlled trials), language, and full-text availability were also applied. The selection of studies retrieved followed the eligibility criteria previously defined in this methodology.

Study selection

Screening was performed in two stages by two independent reviewers: initial assessment of titles and abstracts, followed by full-text evaluation of potentially eligible articles. In cases of disagreement between reviewers, a third reviewer was consulted.

Data extraction and analysis

The extracted data included the number of participants per group, incidence of persistent dysphagia, recurrence of GERD symptoms, continuous use of proton pump inhibitors (PPIs), and patient satisfaction levels. The information was organized into tables and analyzed descriptively and comparatively across the included studies.

Assessed outcomes

i. Primary outcomes: postoperative dysphagia and reflux control;

ii. Secondary outcomes: continued PPI use, quality of life and satisfaction, and reoperations.

Results

A total of 1,014 records were identified across the PubMed, Cochrane, LILACS, and SciELO databases. After the removal of 210 duplicates, 804 records were screened, of which 731 were excluded based on titles and abstracts. Seventy-three studies were selected for full-text assessment; however, 6 could not be retrieved. Of the 67 full-text articles assessed, 58 were excluded for meeting exclusion criteria. Thus, 9 studies were included in the present systematic review. The complete selection process is illustrated in the PRISMA flow diagram (Figure 1), which details the identification, screening, eligibility, and inclusion phases. The included studies were published between 2002 and 2022 and were conducted in six different countries. The total sample comprised 2,130 patients, of whom 1,140 underwent Toupet fundoplication and 990 underwent Nissen fundoplication. Methodological designs included three cohort studies and six randomized controlled trials (RCTs).

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The mean age of patients ranged from 46.6 to 57 years. Sample sizes varied between 84 and 456 participants, and follow-up periods ranged from 12 months to 16 years, indicating variability in study objectives and approaches. The characteristics of the studies included in this review are summarized in Table 1.

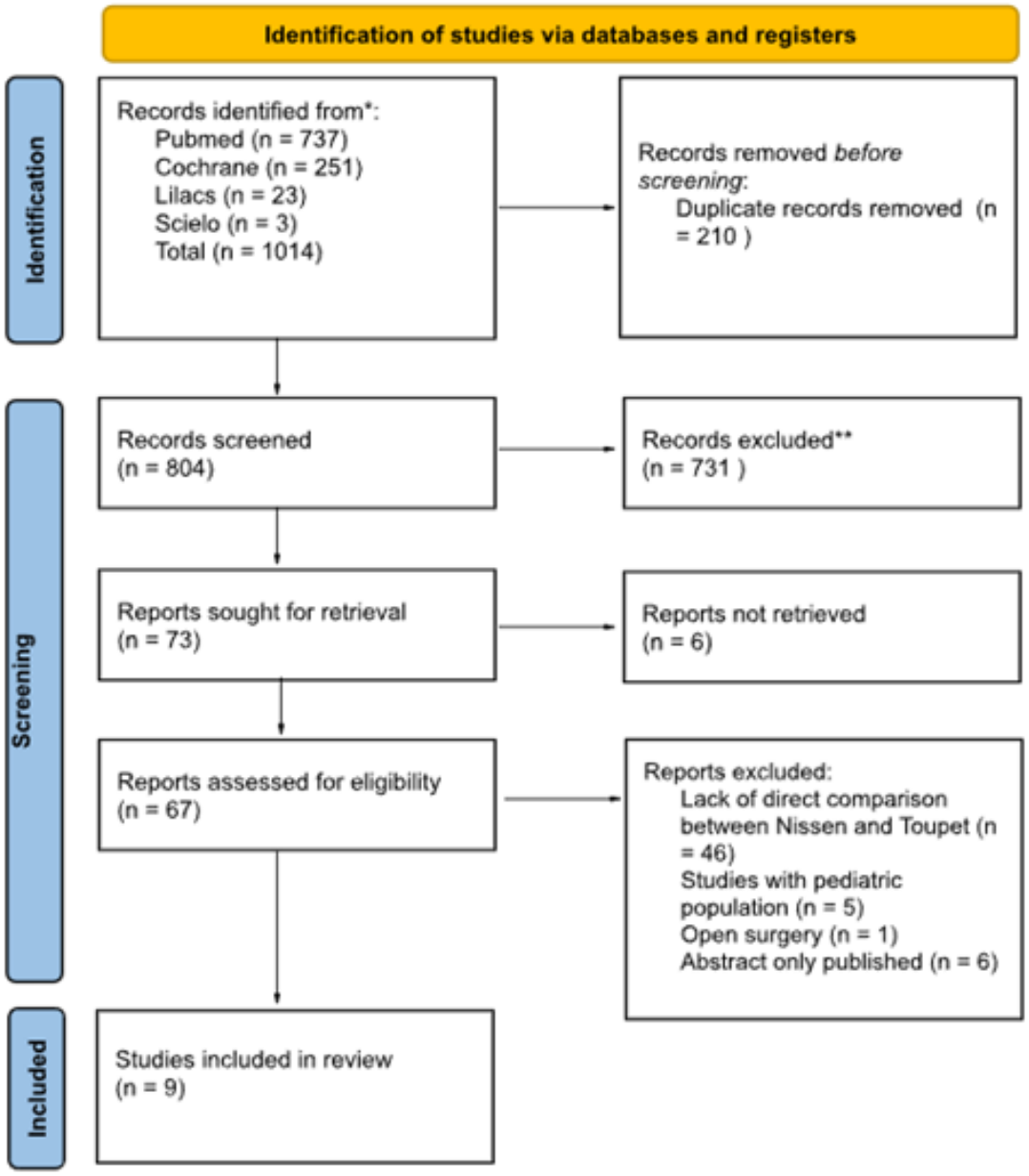

Figure 1 PRISMA flow diagram of this review.

Characteristics of the included studies

Table 1 Description of studies included in the review

Author/Year	Type of study	Country	Number of patients (Toupet/ Nissen)	Average age (Toupet/ Nissen) (years)	Follow-up
Zügel et al.[25]	Retrospective cohort	Germany	162 (122 T / 40 N)	46.6 (±1.6)/ 45.2 (±3.2)	19 months (average)
Radajewski et al.[26]	Prospective cohort	Austria	94 (43 T / 51 N)	54.0 / 47.0	12 months

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Table 1 Continued...

Gunter et al.[27]	Retrospective cohort	USA	316 (155 T / 161 N)	56.6±14.6/ 51.6±13.8	1, 3 and 5 years
Strate et al.[20]	RCT	Germany	200 (100 T / 100 N)	Average of 56 (20-80)	2 years
Qin et al.[28]	RCT	China	383 (168 T / 215 N)	Average of 56.3 (34-82)	5.6 years (average)
Koch et al.[29]	RCT	Austria	125 (63 T / 62 N)	51.87 (25-81)/ 50.32 (20-76)	1 year
Wang et al.[21]	RCT	China	84 (41 T / 43 N)	57.0±10.8 / 57.0±13.2	2 years
Håkanson et al.[19]	RCT	Sweden	456 (229 T / 227 N)	47.9±11.7/ 50.2±11.7	5 years
Analatos et al.[30]	RCT	Sweden	310 (159 T / 151 N)	65 (±11.0)/ 67 (±11.3)	16 years (average)

Reflux control

Table 2 Reflux control according to fundoplication technique

Study (Year)	Type of fundoplication	Outcome: DeMeester score (pre vs post)	P-value	Remarks
Koch et al.[29]	Toupet	24.69±18.0 vs. 6.94±13.72	<0.01	No significant differences
Koch et al.[29]	Nissen	25.15±21.69 vs. 7.99±22.30	<0.01	
Wang et al.[21]	Toupet	42.58±39.38 vs. 12.03±2.18	<0.05	
Wang et al.[21]	Nissen	43.0±42.1 vs. 10.37±3.10	<0.05	Lower in Nissen group
Analatos et al.[30]	Toupet	GSRS Reflux: 1.4±0.7 (1 year); 1.9±1.2 (15 years)	0.18 (15 years)	Symptoms are equally well controlled
Analatos et al.[30]	Nissen	GSRS Reflux: 1.3±0.7 (1 year); 1.7±1.1 (15 years)		

The analyzed studies demonstrated that both surgical techniques, Nissen fundoplication (NF) and Toupet fundoplication (TF), provide effective control of gastroesophageal reflux symptoms. These findings are detailed in Table 2, which presents reflux scores (DeMeester and GSRS) comparing pre- and postoperative periods between the evaluated techniques.

Koch et al.[29] and Wang et al.[21] reported significant improvements in DeMeester scores in both groups, with lower postoperative values observed in the Nissen group. Specifically, Wang et al. found a significantly lower final score in the Nissen group ($p = 0.007$), suggesting a potential superiority in acid suppression. However, Strate et al.[20] and Analatos et al.[30] found no significant differences between the groups during medium- and long-term follow-up. Qin et al,[28] in a study involving 383 patients with a mean follow-up of 5.6 years, reported complete symptom resolution in both groups, although recurrence occurred in 18 patients in the Toupet group.

Use of proton pump inhibitors

Table 3 Postoperative use of proton pump inhibitors (PPIs)

Study (Year)	Surgical Technique	No. of Patients	Follow-up	PPI Use (%)	Remarks
Koch et al.[29]	Nissen and Toupet	125 (T=63 e N=62)	1 year		Both groups showed normalized pH levels and reflux episodes; equivalent effectiveness
Qin et al.[28]	Nissen	215	Average 5.6 years	0% symptomatic recurrence	High endoscopic cure rate (88.4%); no additional use reported
Qin et al.[28]	Toupet	168	Average 5.6 years	≈10.7% (18 patients)	Recurrence treated with PPIs; objective parameters normalized
Gunter et al.[27]	Nissen	161	1, 3, and 5 years	22% at 5 years	Gradual increase in use; satisfaction similar between NF and TF
Gunter et al.[27]	Toupet	155	1, 3, and 5 years	27% at 5 years	More frequent use in the Toupet group, but no statistical difference (p>0.05)
Analatos et al.[30]	Nissen	151	>15 years		Effective symptom control; similar use of PPIs among groups
Analatos et al.[30]	Toupet	159	>15 years		Differences in dysphagia disappear over the long term; equally reflux controlled

The postoperative use of proton pump inhibitors (PPIs) was evaluated as an indirect indicator of symptomatic recurrence. Table 3 provides a summary of PPI usage rates at different follow-up intervals according to the surgical technique performed.

Qin et al.[28] reported that none of the patients in the Nissen group resumed PPI use, whereas approximately 10.7% of patients in the Toupet group required medication. Gunter et al.[27] observed a gradual increase in PPI use over a five-year follow-up: 22% in the Nissen group and 27% in the Toupet group, with no statistically significant difference ($p > 0.05$). Similar findings were reported by Analatos et al.[30] after more than 15 years of follow-up. Koch et al.[29] confirmed normalization of pH monitoring results in both groups.

Postoperative dysphagia

Table 4 Postoperative dysphagia

Study (Year)	Type of fundoplication	Dysphagia incidence/Score (post-op)	P-value	Remarks
Qin et al.[28]	Nissen	27.9% (4 days); 1.4% (12 months)		The difference significantly decreases over time
Qin et al.[28]	Toupet	16.7% (4 days); 0% (12 months)		
Wang et al.[21]	Nissen	22.5% (last follow-up)	P=0.023	Higher in the Nissen group
Wang et al.[21]	Toupet	5.0% (last follow-up)		Lower rate in the Toupet group in the short term
Analatos et al.[30]	Nissen (liquids)	1.1 (0.4) (1 year); 1.2 (0.5) (15 years)		
Analatos et al.[30]	Toupet (liquids)	1.0 (0.3) (1 year); 1.2 (0.5) (15 years)	P=0.58 (15 years)	Initial difference favoring TF disappears over time
Analatos et al.[30]	Nissen (solids)	1.3 (0.6) (1 year); 1.3 (0.5) (15 years)		
Analatos et al.[30]	Toupet (solids)	1.1 (0.4) (1 year); 1.3 (0.6) (15 years)	P=0.97 (15 years)	

Dysphagia was more prevalent in the group undergoing Nissen fundoplication, particularly during the immediate postoperative period. Complete data on dysphagia incidence and scores are presented in Table 4, detailing results according to food consistency and follow-up duration.

Qin et al.[28] reported an incidence of 27.9% in the Nissen group and 16.7% in the Toupet group during the first four days, which declined to 1.4% and 0%, respectively, at 12 months. Wang et al. (2015) observed persistent dysphagia in 22.5% of Nissen patients compared to only 5% in the Toupet group ($p = 0.023$). Gunter et al. (2017) recorded a higher dysphagia score in the first year for the Nissen group (Eckardt 2.35 vs. 1.61), a difference that disappeared in subsequent years. In a 15-year follow-up, Analatos et al.[30] found no significant differences between groups regarding dysphagia for solids or liquids ($p > 0.5$).

Quality of life and satisfaction

Table 5 Quality of life and satisfaction

Study (Year)	Type of Fundoplication	% Satisfaction (Post-op)	QoL Outcome (Post-op)	P-value (between groups)	Remarks
Zügel et al.[25]	Nissen	85%	GIQLI: 87.2 → 118.2 (8 months)		High satisfaction; significant improvement in QoL
Zügel et al.[25]	Toupet	85%	GIQLI: 86.6 / 89.2 → 123.4 / 122.3 (22-23 months)		High satisfaction; especially used for esophageal motility disorders
Radajewski et al.[26]	Nissen	90% (12 months)	Reflux symptoms improved in 92%	P=0.21 (satisfaction)	No significant difference in satisfaction
Radajewski et al.[26]	Toupet	98% (12 months)	Reflux symptoms improved by 95%		
Gunter et al.[27]	Nissen	87.0% (1 year); 77.4% (5 years)	GERD-HRQL: 3.48±5.29 (1 year); Eckardt: 2.35±1.58 (1 year)	P=0.67 (satisfaction, 5 years); P=0.03 (Eckardt, 1 year)	Higher initial dysphagia with Nissen, but decreases

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Table 5 Continued...

Gunter et al.[27]	Toupet	86.8% (1 year); 70.0% (5 years)	GERD-HRQL: 2.45±4.08 (1 year); Eckardt: 1.61±1.98 (1 year)		
Håkanson et al.[19]	Nissen	N/A	Solid dysphagia: 1.3±1.0 (12 months); 1.3±0.9 (24 months)	P<0.001 (solids, 12 months); P=0.001 (solids, 24 months)	Less dysphagia in TF
Håkanson et al.[19]	Toupet	N/A	Solid dysphagia: 1.9±1.4 (12 months); 1.7±1.2 (24 months)		
Analatos et al.[30]	Nissen	N/A	SF-36 PCS: 44.4±11.4 (15 years); SF-36 MCS: 48.2±11.1 (15 years)	No significant difference	QoL equally well controlled
Analatos et al.[30]	Toupet	N/A	SF-36 PCS: 44.1±13.1 (15 years); SF-36 MCS: 48.5±11.9 (15 years)		

Both techniques were effective in improving patient quality of life and satisfaction. Table 5 summarizes the findings related to patient satisfaction and quality of life, including GIQLI, GERD-HRQL, SF-36, and Eckardt scores.

Zügel et al.[25] reported an increase in GIQLI scores from 87 to 118 in the Nissen group and from 88 to 123 in the Toupet group, with 85% satisfaction in both. Radajewski et al.[26] reported 98% satisfaction in the Toupet group and 90% in the Nissen group (p = 0.21), with symptomatic improvement exceeding 90% in both groups. Gunter et al. (2017) presented similar results using the GERD-HRQL scores, with 77.4% satisfaction in the Nissen group and 70% in the Toupet group after five years (p = 0.67). Analatos et al.[30] found no significant differences in SF-36 or GSRS scores between the groups after 15 years of follow-up.

Reoperations

The need for reoperation was more common following Nissen fundoplication. Koch et al.[29] reported that 9.7% of patients in the Nissen group required reintervention within the first year, compared to no cases in the Toupet group. Strate et al.[20] observed 15 reoperations in the Nissen group and only 4 in the Toupet group. Gunter et al.[27] found no statistically significant difference (p = 0.14). Wang et al.[21] reported only one case of hiatal hernia recurrence in each group. Analatos et al.[30] with follow-up exceeding 15 years, reported reoperation rates of 7% for Nissen and 3% for Toupet (p = 0.08).

Discussion

Reflux control

The effectiveness of Nissen (NF) and Toupet (TF) fundoplication in controlling acid reflux has been extensively documented in the literature, with both techniques resulting in a significant reduction in reflux episodes and improvement in pH monitoring scores, such as the DeMeester score.[21,28,29] Although some studies, such as Wang et al.,[21] have reported slightly more favorable final pH monitoring values in the NF group, this finding did not necessarily translate into greater clinical efficacy. Long-term follow-up studies, such as Analatos et al.,[30] demonstrated comparable symptomatic control between the techniques, with similar GSRS scores and overall patient satisfaction after 15 years.

Strate et al.[20] emphasized that despite technical differences, symptom recurrence after two years did not differ significantly between groups. This suggests that the effectiveness of reflux control should be evaluated not only by objective parameters, but also by the clinical improvement perceived by patients. Furthermore, the data indicate that the choice of surgical technique should not rely solely on postoperative pH monitoring values, but rather on a comprehensive assessment of long-term clinical response and quality of life.[19]

Use of proton pump inhibitors

The use of proton pump inhibitors (PPIs) after antireflux surgery has been interpreted by some authors as a possible indicator of therapeutic failure. However, several studies have shown that resumption of PPI use is not necessarily associated with objective recurrence of reflux. Gunter et al.[27] and Analatos et al.[30] observed that even among patients with normalized pH monitoring, a proportion resumed medication use, which may be explained by functional mechanisms such as visceral hypersensitivity, functional dyspepsia, or negative placebo response.

Studies such as that by Spechler and Hunter[31] reinforce that up to 30% of patients may resume PPI therapy after fundoplication, even in the absence of endoscopic evidence of GERD recurrence. Thus, although the rate of PPI use may appear slightly higher in the TF group, the difference is not statistically significant and does not compromise the clinical efficacy of the techniques. The long-term follow-up (>15 years) by Analatos et al.[30] demonstrates that PPI use rates tend to equalize over time, confirming that both techniques maintain effective disease control.

Postoperative dysphagia

Dysphagia is one of the main postoperative concerns following fundoplication, particularly after the Nissen technique. The literature suggests that a 360° total fundoplication may exert increased pressure on the distal esophagus, impairing bolus transit, especially in patients with borderline esophageal motility.[15,20] Studies such as those by Qin et al.[28] and Wang et al.[21] confirm a higher incidence of early postoperative dysphagia in NF, with significantly lower rates in the TF group.

However, there is consensus that dysphagia tends to improve over time. Gunter et al.[27] and Analatos et al.[30] demonstrated that, after a follow-up period of 3 to 5 years, dysphagia scores become similar between the two techniques. This reinforces the notion that transient dysphagia may be expected in the immediate postoperative period, particularly following NF, but rarely persists in the long term. Preoperative manometric evaluation remains an essential tool to tailor the surgical approach and avoid suboptimal outcomes in patients with impaired motility.[23]

Quality of life and satisfaction

Improvement in quality of life is one of the primary objectives of anti-reflux surgery, and in this regard, both NF and TF have demonstrated favorable outcomes. Zügel et al.[25] and Radajewski et al.[26] reported substantial improvements in GIQLI scores and high levels of satisfaction, regardless of the technique employed. These findings were corroborated by Gunter et al.[27] and Analatos et al.,[30] who found no statistical differences in quality of life or satisfaction in follow-up periods extending up to 15 years.

Radajewski et al. also demonstrated equivalent postoperative quality-of-life scores and patient satisfaction between Nissen and Toupet fundoplication at 12 months, although a higher requirement for postoperative dilatation due to dysphagia was observed after Nissen fundoplication.[26]

Although NF is associated with increased dysphagia in the short term, this does not appear to negatively impact patient satisfaction. The results suggest that the perception of symptom control and overall functional improvement carries more weight in the subjective assessment of patients than transient symptoms such as mild dysphagia. Therefore, the choice of technique should take into account the anatomical and functional aspects of the esophagus, but there is no evidence of superiority in terms of satisfaction between the two techniques.[19]

Reoperations

Reoperations following fundoplication are undesirable events that typically reflect technical failures, such as rupture of the cruroplasty or intrathoracic herniation of the valve. Koch et al.[29] and Strate et al.[20] identified a higher need for reintervention in the NF group, with causes primarily related to persistent dysphagia and anatomical failures. Conversely, Gunter et al.[27] and Analatos et al.[30] found no statistically significant differences, despite a higher trend observed in the Nissen group.

The Toupet technique, being less restrictive, may provide greater long-term anatomical stability, particularly in patients with esophageal motility disorders. Rieger et al.[32] emphasize that the success of fundoplication is directly related to the integrity of the cruroplasty and the appropriate choice of technique based on functional assessments. Therefore, individualization of the surgical approach is essential to minimize reoperation rates and maximize long-term outcomes.

The present review reinforces that the long-standing debate between total and partial fundoplication should not be framed as a question of superiority, but rather of functional trade-offs. Although Nissen fundoplication may achieve slightly greater augmentation of the lower esophageal sphincter and improved acid suppression in selected studies, this advantage does not translate into superior long-term patient-centered outcomes.

Authors' institutional experience

Table 6 Institutional experience of the senior author in GERD surgery (2013-2025)

Variable	Result
Number of patients	223
Female sex	58.3%
Mean age	54.6 years
Hiatal hernia	70.4%
Erosive esophagitis	57.5%
Barret's esophagus	15 patients
Mean LES pressure	9.28 mmHg
Toupet fundoplication	86.0%
Nissen fundoplication	1.4%
Reinterventions	38 patients (only 2 had been operated on previously by the author)

Between September 2013 and April 2025, the senior author (FFL) performed antireflux procedures in 223 patients with gastroesophageal reflux disease (GERD). In this series, Toupet fundoplication was the predominant technique, accounting for 86.05% of procedures, whereas Nissen fundoplication represented only 1.44% of cases.

The mean patient age was 54.66 years, with a predominance of female patients (58.3%). Hiatal hernia was identified in 70.38% of evaluated patients, and erosive esophagitis was present in 57.48% of cases. Barrett's esophagus was identified in 15 patients.[33,34]

Manometric evaluation demonstrated a mean lower esophageal sphincter pressure of 9.28 mmHg and a mean upper esophageal sphincter pressure of 49.87 mmHg.

Reintervention was required in 38 patients; however, only two patients had undergone their initial operation by the senior author, suggesting that most redo procedures were referred cases from previous surgeries performed elsewhere.[35] This personal experience aligns with the findings of the present systematic review, particularly regarding the preference for partial posterior fundoplication in patients with suspected or documented esophageal motility disorders, aiming to reduce postoperative dysphagia while maintaining satisfactory reflux control.

The findings of the present systematic review are also consistent with the senior author's personal experience in a high-volume referral center, where Toupet fundoplication has been preferentially adopted over the last decade, particularly in patients with impaired esophageal motility or increased risk of postoperative dysphagia.[36,37] Emerging alternatives such as magnetic sphincter augmentation (MSA) have shown promising reflux control; however, current evidence still supports Toupet fundoplication as a reliable and well-established option with favorable functional outcomes and lower rates of persistent dysphagia in selected patients.[38]

Conclusion

This literature review demonstrated that both the Nissen and Toupet techniques are effective in the surgical treatment of GERD. Both Nissen and Toupet fundoplication are effective surgical options for GERD, providing durable symptom control and comparable long-term outcomes. However, their functional profiles differ, with Nissen associated with higher rates of early dysphagia and Toupet offering better preservation of esophageal motility. These findings support a paradigm shift from a "one-size-fits-all" approach toward individualized surgical decision-making. Rather than prioritizing maximal acid suppression, the selection of fundoplication technique should be guided by esophageal function and patient-specific factors, aiming to optimize both efficacy and postoperative quality of life and patient satisfaction.

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Conflicts of interest

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