Fundoplication Versus Gastric Bypass for Management of GERD and Hiatal Hernias in Obese Patients: A Systematic Review

Shahad Abdulkhaleq Mamalchi[1], Mariam Abdelghaffar[2], Alexandre Marceau[3], Jeffrey D Hawel[4], Christopher M Schlachta[5], Ahmad Elnahas[6]

Introduction

- Severe obesity is associated with an increased prevalence of hiatal hernias (HH) and gastroesophageal reflux disease (GERD)[1].
- Both fundoplication (FP) and gastric bypass (GB) are utilized to manage these conditions, but comparative outcomes are not well-established[2,3].
- This systematic review aims to compare surgical outcomes of FP versus GB for managing GERD and HH in obese adults.

Methods

Following PRISMA guidelines, we systematically searched Scopus and PubMed for relevant studies published up to April 2024. Inclusion criteria encompassed adult obese patients (BMI ≥ 30) with HH or GERD undergoing their first FP or GB procedure. We excluded non-English articles, case reports, and studies with incomplete data. Data extraction and quality assessment were performed using Covidence and the ROBINS-I tool, respectively. Key outcomes assessed included postoperative reflux, surgical complications, recurrence of symptoms, and need for reoperation.

Results

Of 191 screened articles, a total of 5 studies met the inclusion criteria. Analysis revealed that both FP and GB effectively manage GERD. A three-arm study[4] assessing postoperative outcomes in 150 patients found that single anastomosis gastric bypass with FP led to fewer complications compared to bypass without FP, which had a significantly higher complication rate (p=0.045). 26% of patients without FP experienced esophagitis compared to 14% with FP.

Figure 1. Summary Table of Reported Data from Included Studies

Study	Intervention	Number of Patients	Female N (%)	Intra-operative Complications N (%)	Recurrence of Reflux Symptoms N (%)	Postoperative Reflux	Post-operative complications N (%)
Ospanov	FundoRingOAGB	50	45 (90)	0 (0)	0 (0)	*GERD-HRQL: 20.6 (2.24) to 0.44 (0.73)	0 (0) (p-Value 0.045)
2024	NissenOAGB	50	43 (86)	1 (2)	7 (14)	*GERD-HRQL: 21.34 (2.43) to 1.14 (1.4)	8 (16)
	OAGB	50	44 (88)	1 (2)	13 (26)	*GERD-HRQL: 20.5 (2.17) to 2.12 (1.36)	14 (28)
DuCoin	Fundoplication	40	35 (88)	NA	NA	Heartburn resolution: 87.0% (p-Value 1.00)	11 (28) (p-Value 0.75)
2022	RYGB	16	15 (94)	NA	NA	Heartburn resolution: 93.3%	5 (31)
Varela	Fundoplication	6108	3482 (57)	122 (2)	NA	NA	10% (p-Value < 0.05)
2008	Gastric bypass	21156	17 559 (83)	275 (1.3)	NA	NA	7%
Patterson	Nissen	6	NA	0 (0)	NA	*DMS 64.38 - 2.8	0 (0)
2003	RYGB	6	NA	0 (0)	NA	*DMS 34.76 - 5.7	0 (0)
Joseph	Fundoplication	72	62 (86)	2 (3)	NA	*DMS 31-6 (p-Value 0.99) *GERD-HRQL: 4.9 (7.2) at 2 years *GERD-HRQL: 3.3 (4.1) at 5 years	7 (9.7) (p-Value 0.70)
2024	RYGB	23	21 (91)	1 (4)	NA	*DMS 29-20 *GERD-HRQL: 10.2 (10.6) at 2 years *GERD-HRQL: 9.0 (4.6) at 5 years	3 (13)

***DMS: DeMeester score** - A composite score of the acid exposure during a prolonged ambulatory pH monitoring to categorize patients as GERD+ or GERD-.
***GERD-HRQL: GERD- Health Related Quality of Life, mean (SD)**- A questionnaire developed to measure changes of typical GERD symptoms such as heartburn and regurgitation in response to management.

Another study[5] found similar overall complication rates between GB and FP but noted fewer symptomatic hernia recurrences in the GB group. A very large retrospective study[6] indicated a significantly lower complication rate for GB compared to FP (7% vs 10%, $p < 0.05$). With respect to reflux scores and subjective symptom control, one study[8] found no significant differences between FP and GB postoperatively, but GB resulted in greater weight loss.

Discussion

FP and GB are effective in resolving GERD symptoms. However, adding a fundoplication with the remnant stomach when performing a single anastomosis bypass technique (OAGB) may decrease post-operative acid and bile reflux. A trend towards more HH recurrence post-fundoplication is also noted, especially in the context of significant obesity.

The heterogeneity of study designs, patient populations, outcomes, and follow-up durations may introduce bias in the findings of this review. Additionally, many of the studies included were observational, with a paucity of randomized controlled trials directly comparing the two surgical interventions.

Conclusion

- Both FP and GB offer substantial benefits in managing GERD and HH in obese patients.
- FP shows a trend towards more symptom control but higher hiatal hernia recurrence.
- GB is a safe and effective treatment for GERD and HH in obese patients and should be strongly considered in this patient population.
- Future research should focus on randomized controlled trials to better define the comparative efficacy of these interventions.

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AFFILIATIONS
1,2. Royal College of Surgeons in Ireland - Medical University of Bahrain
3,4,5,6 Division of General Surgery, Department of Surgery, Canadian Surgical Technologies and Advanced Robotics (CSTAR), London Health Sciences Centre, Schulich School of Medicine and Dentistry, Western University Hospital, London, Ontario, Canada