Clinical Outcomes of Reoperation for Failed Antireflux Operations

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Background. Up to 18% of patients undergoing antireflux operations will require reoperation. Authors caution that with each additional reoperation, fewer patients achieve satisfaction. The quality of life in patients who underwent revision operations was compared with patients who underwent primary antireflux operations to determine the effectiveness of revision operations.

Methods. We retrospectively reviewed patients who underwent revision after failed antireflux operations from 2004 to 2014. Patients were divided into two groups: first reoperation (Reop[1]) and more than one reoperation (Reop[>1]). For comparison, a control group of patients who underwent primary antireflux operations was included. Patients underwent quality of life assessment preoperatively and postoperatively.

Results. We identified 105 reoperative patients: 94 Reop(1), 11 Reop(>1), and 112 controls. The primary reason for failure was combined fundoplication herniation and slippage. Morbidity, mortality, and readmission rates were similar in all groups. Postoperative outcomes were improved in all groups but to a lesser degree in subsequent reoperations. Gastroesophageal Reflux Disease Health-Related Quality of Life: controls, 20.0 to 2.0; Reop(1), 26.5 to 4.0; and Reop(>1), 13.0 to 2.0. Quality of Life in Reflux and Dyspepsia: controls, 4.5 to 7.0; Reop(1), 3.7 to 6.7; and Reop(>1), 3.5 to 5.8. Dysphagia Severity Score: controls, 44.0 to 45.0; Reop(1), 36.0 to 45.0; and Reop(>1), 30.8 to 45.0.

Conclusions. Patients undergoing revision antireflux operations have improved quality of life, relatively normal swallowing, and primary symptom resolution at a median of 20 months postoperatively. However, patients who undergo more than one reoperation have lower quality of life scores and less improvement in dysphagia, suggesting that other procedures such as Roux-en-Y or short colon interposition, should be considered after a failed initial reoperation.

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Surgical treatment for gastroesophageal reflux disease (GERD) is safe, effective, and provides excellent long-term control of reflux symptoms [1, 2]. However, recurrent, persistent, or new symptoms signaling fundoplication failure have been reported in up to 33% of patients after open repair at 7 years and in 18% of patients after laparoscopic repair at 20 years [1–3]. Up to 18% of these patients are likely to undergo reoperation for symptom control or recurrent herniation, or both [3–6]. The reoperations are often more challenging due to adhesions between organs, scarring of surgical planes, and obscuring of native anatomy created by the prior procedures.

The results of patients undergoing open and laparoscopic reoperative antireflux surgery (ARS) have been "satisfactory-to-excellent" in 84% to 86% [4, 6–8]. Even though safe and effective, morbidity rates are reported to be higher [8]. Several authors have also cautioned that each additional reoperation results in fewer patients achieving a satisfactory-to-excellent outcome [7, 9–11]. However, these clinical reports rarely have a comparison group of patients who underwent a successful primary repair [11]. The lack of comparative data encouraged us to compare the clinical outcomes and quality of life (QOL) in patients who underwent reoperation for failed ARS with those who had a successful initial operation.

Patients and Methods

We retrospectively reviewed patients who underwent revision surgery after failed ARS from January 2004 to December 2014 at Swedish Medical Center. The Institutional Review Board approved this study and waived the requirement for individual consent due to the study's retrospective nature. In 1,193 ARS procedures performed for GERD during this time period, 143 reoperations were identified. Patients were excluded if they underwent prior bariatric or foregut operations other than primary ARS (n = 23); if the revision operation was a Roux-en-Y (REY) gastrojejunostomy (n = 7); if the reoperation was esophageal obstruction during the same admission as the primary operation (n = 3); and if patients required a concomitant pyloromyotomy for gastroparesis (n = 5).

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Abbreviations and Acronyms

ARS = antireflux surgery
ASA = American Society of Anesthesiologists
GERD = gastroesophageal reflux disease
HRQL = Health Related Quality of Life
IQR = interquartile range
MIS = minimally invasive surgery
QOL = quality of life
QOLRAD = Quality of Life in Reflux and Dyspepsia
Reop(1) = one reoperation
Reop(>1) = more than one reoperation
REY = Roux-en-Y

The 105 eligible patients who had a documented anatomic failure of a previous fundoplication or recurrent, persistent, or new symptoms related to the previous repair, or both, were divided into two groups: first reoperation (Reop[1]; n = 94), and more than one reoperation (Reop [>1]; n = 11). For comparison, a control group of randomly selected patients from our esophageal surgery database who underwent primary ARS with similar indications, surgical procedures, and approaches were included. These patients spanned the same time period and were randomly selected by being assigned consecutive numbers, and then the patients associated with one number were selected.

Preoperative and postoperative clinical and QOL assessment in the form of the GERD-Health-Related Quality of Life (HRQL), Quality of Life in Reflux and Dyspepsia (QOLRAD), and Dysphagia Severity Score questionnaires were collected. The GERD-HRQL is a validated self-administered, disease-specific QOL instrument that measures symptom severity in GERD [12]. Scores range from 0 to 54, with a lower score indicating a better QOL. The QOLRAD is a validated 25-item self-administered questionnaire for patients with upper gastrointestinal symptoms [13]. Scores range from 1 to 7, with a higher score indicating a better QOL. The Dysphagia Severity Score assesses swallowing ability [14]. A score of 0 indicates no food can be ingested, and a maximum score of 45 represents the ability to ingest the entire meal without difficulty.

Operative findings reported by the surgeon at the time of reoperation were reclassified according to a categorization of types of surgical failure described by Richter [15]:

- Herniation (type IA): fundoplication and gastroesophageal junction herniation
- Slippage (type IB): slipped fundoplication with hiatal hernia where the wrap remains below the diaphragm
- Paraesophageal herniation (type II): paraesophageal herniation, usually posterior
- Malposition (type III): malposition of the fundoplication

Patients with a disrupted or intact repair were separately classified.

The choice of reoperative procedure was individualized to each patient based on the preoperative assessment, intraoperative findings, and attending surgeon. Regardless of the reason for failure, the steps followed were take down of the previous fundoplication, esophageal mobilization, identification of the vagal nerves, repair of the hiatal defect, and creation of an antireflux procedure (Nissen, Hill, or Toupet). A novel repair, the Nissen-Hill hybrid, was used in some patients and has been previously described [16]. A Collis gastroplasty was used at the attending surgeon's discretion when a shortened esophagus (<2 cm intra-abdominal length) was encountered. Biologic mesh and crural relaxing incisions were used selectively.

Postoperative data were categorized according to the Ottawa Classification of Thoracic Morbidity (grades I to IV) and Mortality (grade V), which is an in-hospital, validated grading system of complications [17]. Recorded readmissions were within 30 days of discharge.

All data are reported as proportions or medians with the 25th to 75th interquartile ranges (IQR). Categoric variables and proportions were compared using Pearson χ^2 test, and continuous variables were compared using the Kruskal-Wallis test. A p value of less than 0.05 was considered significant. Statistical analyses were performed using SPSS 19.0 software (IBM Corp, Armonk, NY).

Results

We identified 105 reoperative patients, 94 in Reop(1) and 11 in Reop(>1), and 112 controls. In the Reop(>1) group, 8 patients (73%) had 2 prior antireflux procedures and 3 patients (27%) had 3 prior procedures. The original operation was performed at our institution in 22 Reop(1) patients (23%), and 6 Reop(>1) patients (55%) underwent at least one of their previous operations at our institution. The three groups were comparable preoperatively except that Reop(>1) patients had a higher percentage of primary atypical symptoms (p = 0.003). Patient characteristics are reported in Table 1.

Table 1. Preoperative Patient Characteristics

Characteristics	Controls (n = 112)	Reop(1) (n = 94)	Reop(>1) (n = 11)
Age, median (IQR) y	56 (47–67)	57 (48–65)	59 (58–61)
Female gender, % (No.)	63 (71)	61 (57)	73 (8)
Body mass index, median (IQR) kg/m^2	30 (23–33)	30 (27–33)	30 (25–33)
ASA classification, median (IQR) score	2	2 (2–3)	2 (2–3)
Primary symptom at reoperation			
Typical, % (No.)	64 (72)	76 (71)	27 (3)
Atypical, % (No.)	36 (40)	24 (23)	73 (8)[a]
Endoscopy			
Barrett's esophagus, % (No.)	22 (22)	26 (24)	9 (1)
Long segment, % (No.)	7 (7)	8 (7)	9 (1)
Hiatal hernia, % (No.)	92 (94)	81 (75)	55 (6)
>6 cm, % (No.)	38 (39)	24 (22)	0

[a] p = 0.003.

ASA = American Society of Anesthesiologists; IQR = interquartile range; Reop(1) = patients with one reoperation; Reop(>1) = patients with more than one reoperation.