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Meta-Analysis for Comparison between Antireflux Surgery with or without Endoscopic Management of Barrett's Esophagus

Thesis

Submitted in Partial Fulfillment for the Requirements
of Master Degree in General Surgery

By

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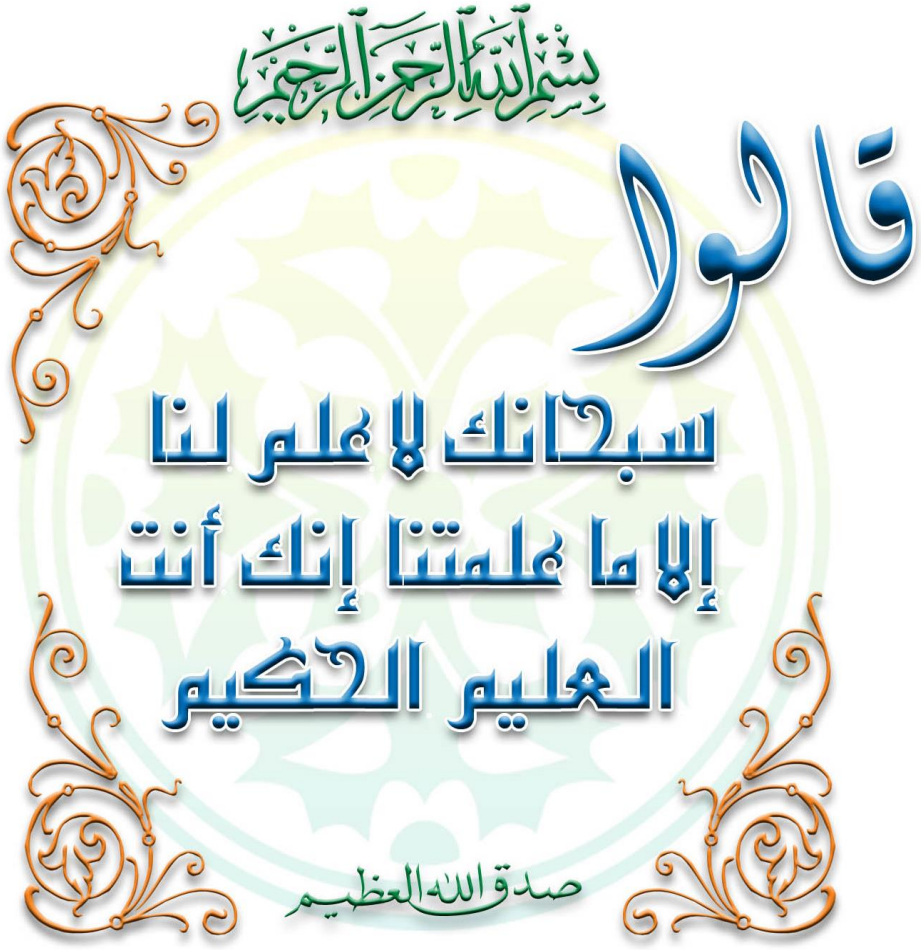

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ABSTRACT

Background: In patients with BE, anti-reflux surgery aims to sustainable control reflux symptoms and heal reflux induced esophageal mucosal inflammation and prevent progression of BE to adenocarcinoma. Endoscopic resection of visible lesions if any, followed by ablation of the rest of the BE epithelium is the current standard of care for management of BE with confirmed dysplasia. Although the current literature describes multiple endoscopic and anti-reflux techniques for the management of BE, there is no published evidence on the efficacy of anti-reflux surgery followed by endoscopic management on the outcomes of BE.

Aim of the study: The objective of this study was to compare between anti-reflux surgery with or without endoscopic management of BE.

Patients and Methods: In the present study, we searched Medline via PubMed, SCOPUS, Web of Science, Cochrane Central Register of Controlled Trials (CENTRAL), and Google Scholar. The search retrieved 2089 unique records. We then retained 57 potentially eligible records for full-texts screening. Finally, 6 studies were included.

Results: In the present systematic review and meta-analysis, five studies reported the rates of recurrence. The overall effect estimates showed the rate of recurrence was 5.7% (95% CI 1.2– 10.2%). In the present systematic review and meta-analysis, five studies reported the overall complications rate. The overall effect estimates showed the overall complications rate was 7.3% (95% CI 4.1– 10.6%), mainly stricture and perforation.

Conclusion: Endoscopic procedures after anti-reflux surgery is a safe modality, with high rate of success in complete eradication of BE in symptomatic GERD patients, especially those with severe anatomical impairment in distal esophageal segment. As a concurrent procedure, endoscopic procedures may be beneficial in the terms of reducing the early recurrence rates, which seems to be important issue during the management of BE. By doing synchronous endoscopic procedures and fundoplication, one might observe a true anatomy of esophagogastric junction in its entirety and might be able to truly observe the distal extent of columnar esophagus.

Keywords: Antireflux Surgery, Endoscopic Management, Barrett's Esophagus

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List of Abbreviations

Abb.	Full term
ACG	*American college of Gastroenterology*
AFI	*Autoflurorescance imaging*
AGA	*American Gastroenterological Association*
APC	*Argon plasma coagulation*
ARS	*Anti-reflux surgery*
ASGE	*American Society for Gastrointestinal Endoscopy*
BE	*Barrett's esophagus*
BE	*Barrett's esophagus*
BING	*Barrett's International NBI Group*
BSG	*British society of Gastroenterology*
CE-D	*Complete eradication of dysplasia*
CE-IM	*Complete eradication of intestinal metaplesia*
CI	*Confidence interval*
CR-IM	*Complete remission of intestinal metaplasia*
EAC	*Esophageal Adenocarcinoma*
EET	*Endoscopic eradication therapy*
EMR	*Endoscopic Mucosal Resection*
ESD	*Endoscopic submucosal resection*
ESGE	*European Society for Gastrointestinal Endoscopy*
EUS	*Endoscopic ultrasonography*
GEJ	*Gastroesophageal Junction*
GERD	*Gastroesophageal Reflux Disease*
H2RA	*Histamine-2 receptor antagonist*
HGD	*High Grade Dysplasia*
HH	*Hiatus Hernia*
HRME	*High Resolution Magnification endoscopy*
I^2	*I-square (statistical term)*
IC	*Indigo carmine*
IM	*Intestinal metaplasia*

List of Abbreviations **cont...**

Abb.	Full term
IWGCO	*International Working Group for the Classification of esophagitis*
JES	*Japan Esophageal Society*
KDA	*Kilo Dalton*
LES	*Lower Esophageal Sphincter*
LESP	*Lower Esophageal Sphincter Pressure*
LGD	*Low Grade Dysplasia*
LI	*Lugol's Iodine*
LOH	*Loss of heterozygosity*
MB	*Methylene Blue*
MT	*Medical treatment*
N/A	*Not applicable*
NBI	*Narrow Band Imaging*
NDBE	*Nondysplastic Barrett's Esophagus*
NF	*Nissen fundolication*
P	*P-value*
PDT	*Photodynamic therapy*
pka	*Acid dissociation constant*
PPIs	*Proton Pump inhibitors*
QALY	*Quality adjusted life year*
RFA	*Radiofrequency ablation*
SCJ	*Squamocolumnar Junction*
SIM	*Specialised intestinal Metaplasia*
SM	*Submucosal*
SRER	*Stepwise radical endoscopic resection*
TTS	*Through the scope*

INTRODUCTION

Barrett's esophagus is a condition resulting from chronic gastro-esophageal reflux disease with a documented risk of esophageal adenocarcinoma. The classic definition of Barrett's esophagus (BE) comprises the presence of columnar epithelium with prominent goblet cells indicative of intestinal metaplasia (IM) populating the tubular esophagus proximal to the anatomic squamo-columnar junction. American association of gastroenterology, recommended the presence of IM for the diagnosis of BE while the British society of gastroenterology guidelines do not require the presence of IM for the diagnosis of BE. Presently, the diagnosis of BE is based on a combination of endoscopic and histologic criteria. The diagnosis of BE is established when intestinal metaplasia (IM) is found in biopsy specimens obtained from salmon colored mucosa in the distal esophagus proximal to the gastro-esophageal junction (GEJ) ***(Spechler et al., 2011).***

Acid suppressive therapy, specifically proton pump inhibitors (PPIs), has been shown to improve symptoms and to heal and prevent relapse of erosive esophagitis in patients with BE. Evidence to support use of PPIs, in patients with BE solely to reduce risk of progression to dysplasia or cancer is indirect and has not been proven in a long-term controlled trial. Epidemiologic data suggest a lower risk of progression in PPI users. There is also some evidence to suggest that long-term

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therapy may induce regression of IM and promote the development of squamous islands ***(Kastelein et al., 2011).***

As development of BE is based on gastro-esophageal reflux, a potential concept would be to stop reflux by anti-reflux surgery and thereby interrupt the mechanisms of malignant transformation. Fundoplication effectively controls reflux symptoms in most patients ***(Miholic et al., 2012).*** Some authors found that surgical control of reflux disease has not been found to be associated with a decrease in the incidence of esophageal cancer ***(Kauttu et al., 2012).***

Before the advent of endoscopic therapies, esophagectomy was the primary treatment option for patients with high grade dysplasia (HGD). Esophagectomy offers the most definite treatment in patients with BE with HGD (in particular in patients with multifocal HGD since it eliminates all of the Barrett's epithelium preventing the risk of progression. In patients with HGD, a benefit of esophagectomy includes the treatment of an occult carcinoma (the incidence of occult adenocarcinoma, ranging from 0% to 73%) ***(DeMeester, 2010).***

The standard surgical resection in most patients includes a total esophagectomy with a transhiatal or transthoracic approach, and reconstruction with gastric pull up or tubularized gastric conduit and the anastomosis performed in the neck or the high chest. In some cases esophageal resection could be performed minimally invasively. Limited vagal-sparing surgery