

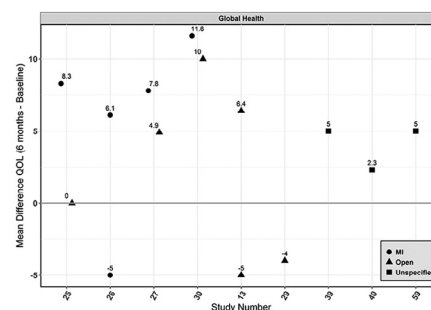
Quality of Life after Open or Minimally Invasive Esophagectomy in Patients With Esophageal Cancer—A Systematic Review

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Although esophageal cancer is rare in the United States, 5-year survival and quality of life (QoL) are poor following esophageal cancer surgery. Although esophageal cancer has been surgically treated with esophagectomy through thoracotomy, an open procedure, minimally invasive surgical procedures have been recently introduced to decrease the risk of complications and improve QoL after surgery. The current study is a systematic review of the published literature to assess differences in QoL after traditional (open) or minimally invasive esophagectomy. We hypothesized that QoL is consistently better in patients treated with minimally invasive surgery than in those treated with a more traditional and invasive approach. Although global health, social function, and emotional function improved more commonly after minimally invasive surgery compared with open surgery, physical function and role function, as well as symptoms including choking, dysphagia, eating problems, and trouble swallowing saliva, declined for both surgery types. Cognitive function was equivocal across both groups. The potential small benefits in global and mental health status among those who experience minimally invasive surgery should be considered with caution given the possibility of publication and selection bias.

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Keywords: esophageal cancer, quality of life, surgical type



Global health quality of life is slightly better after minimally invasive than after open surgery.

Central Message

Quality of life is consistently poor 6 months following esophageal cancer surgery, although minimally invasive surgery may have some benefits for global and mental health compared with open surgery.

INTRODUCTION

Although esophageal cancer represents 1% of incident cancer cases in the United States,¹ it was the 10th most lethal cancer in 2014, with a mortality rate of 5.1 per 100,000.² Historically, esophageal cancer was surgically treated with esophagectomy through thoracotomy, an open procedure, although this has been associated with an increased risk of postoperative complications.³ Since the

early 1990s, however, less invasive surgical procedures were introduced to decrease the risk of complications and improve quality of life (QoL) after surgery.³ Despite advances in treatment, the 5-year relative survival (18.2% from 2008 to 2013) remains low.² To investigate the short- and long-term outcomes of minimally invasive (MI) procedures, the multicenter Traditional Invasive vs. Minimally Invasive Esophagectomy (TIME) trial randomly assigned patients with esophageal cancer to undergo either traditional or MI esophagectomy.⁴ Compared with the traditional approach, patients undergoing MI procedure had significantly fewer postoperative pulmonary infections (9% vs 34%, respectively), superior overall 3-year survival (40.4% vs 50.5%, respectively), and better disease-free 3-year survival (35.9% and 40.2%, respectively).^{4,5}

In addition to survival and surgery-related morbidity, QoL after esophagectomy has been recognized as an important measure when studying outcomes.⁶ To date, several review studies have investigated the relationship between esophageal surgery and QoL, and although 1 examined QoL changes according to surgical type subgroups,⁷ none have directly compared QoL changes according to surgical subgroup. Although some reviews reported changes in QoL following esophagectomy, this approach was qualitative in nature and did not directly compare MI with open surgery.^{7,8} Two

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further systematic reviews did not specify changes in QoL according to type of surgery,^{9,10} and one of them did not compare QoL between postsurgical and baseline values.⁹

To that end, the current study includes a systematic review of the published literature on QoL following esophageal cancer surgery to assess differences in QoL after traditional (open) or MI esophagectomy. We hypothesized that QoL is consistently better in patients treated with MI surgery compared with those treated with a more traditional and invasive approach.

METHODS

Search Strategy and Selection Criteria

Original research studies measuring QoL before and after esophagectomy in patients with esophageal cancer were identified from the National Library of Medicine database from January 1990 to January 2017. The search strategy included the following keywords: “esophageal cancer,” “quality of life,” and “surgery.” The reference lists from articles retrieved from this database, as well as references from published reviews on QoL after esophagectomy in esophageal cancer patients,⁷⁻¹⁰ were reviewed and evaluated for eligibility.

Studies were considered eligible for inclusion in this systematic review if (1) patients were treated with esophagectomy, (2) results from a QoL questionnaire were reported at baseline and at 3- or 6-month postsurgical follow-up, (3) articles were published in English, and (4) articles were published between 1990 and January 2017. Studies were excluded for the following reasons: (1) study was a meta-analysis or review, (2) study involved repetitive data or duplicates, and (3) the study sample size ≤ 10 patients.

Data Extraction

All relevant descriptive information was extracted from each study, including author, year of publication, study design, years of data collection, number of patients included, case selection, tumor histology, type of surgery, other cancer treatments, and type of QoL questionnaire used. The primary outcome of this study was changes in QoL from baseline to 6 months following surgery.

Statistical Methods

The mean and standard deviation for each available QoL item were extracted from each study. Further analysis was performed on 15 articles that reported the same validated QoL scales (European Organization for Research and Treatment of Cancer [EORTC] QLQ-C30 and EORTC QLQ-OES18), and differences in QoL between 6-month follow-up and baseline questionnaire were calculated, overall and according to type of surgery (MI or open). The EORTC QLQ-30 measures QoL for patients with cancer on a scale from 0 to 100,¹¹ whereas the EORTC QLQ-OES18 is a shorter form that can be tailored specifically to esophageal cancer.¹²

Statistical analyses were performed using R Studio (version 3.2.2; R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

The initial PubMed search yielded 1134 articles, 963 of which were excluded based on the title not being pertinent with the scope of this review (GM). On comprehensive review of the remaining articles, 126 were further excluded because they did not meet the inclusion criteria, resulting in 45 articles potentially suitable for analysis (GM; Fig. 1 - Table). Any questions concerning the content

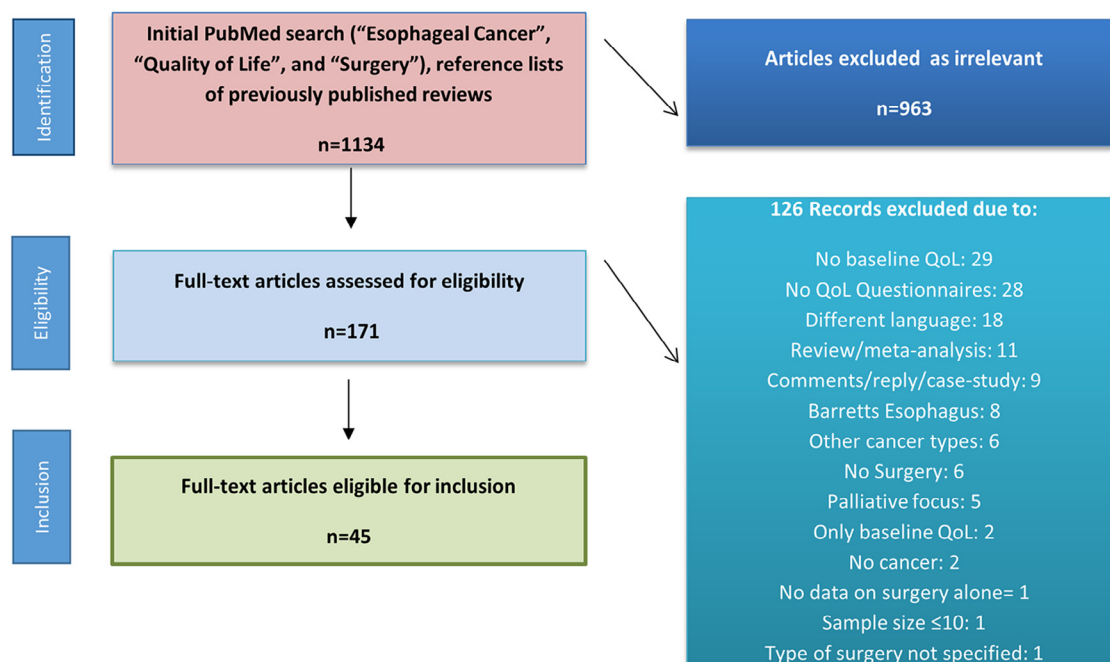


Figure 1. Article selection process—Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) graph. (Color version of figure is available online.)

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