A Systematic Review to Compare the Safety and Efficacy between Open Esophagectomy and Hybrid Minimally Invasive Esophagectomy

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Abstract

Background: The mainstay treatment regimen for esophageal cancer is still surgical resection with or without neoadjuvant theapy. The two major surgical approaches are open esophagectomy and hybrid minimally invasive surgery, however safety and efficacy between these two approaches are still controversial.

Aim: This review article aims to compare the perioperative and postoperative complications between OE and HMIE in esophageal cancer management.

Methods: Web of science, EMBASE, PubMed, Scopus, and Cochrane Library databases were explored for related researches. The odds ratio (OR), standard mean difference (SMD) and 95% confidence interval (CI) were put into use to explore the statistical outcomes

Results: Eight studies including a total of 6053 patients were selected. HMIE was significantly associated with less conduit necrosis (RR=3.54, 95% CI = [1.07, 11.73], p = 0.04), post operative pneumonia (RR=1.29, 95% CI = [1.05, 1.57], p = 0.01) and recurrent laryngeal nerve paralysis (RR=2.51, 95% CI = [1.13, 5.55], p = 0.02). No significant differences were seen in the Clavien- dindo classification of complications grade IIIa-IVb(RR=1.13, 95% CI = [0.92, 1.38], p = 0.24), Clavien-dindo classification of complications grade V(RR=1.03, 95% CI = [0.30, 3.51], p = 0.96), Bleeding(RR=1.41, 95% CI = [0.46, 4.32], p = 0.55), In hospital Mortality (RR=1.69, 95% CI = [0.79, 3.64], p = 0.18) ,90 day mortality(RR=1.25, 95% CI = [0.90, 1.74], p = 0.19), Duration of surgery(MD = 6.19, 95% CI = [-23.26, 35.64], p < 0.68), Hospital stays(MD = -0.20, 95% CI = [-1.81, 1.40], p < 0.80) and ICU stays(MD = 1.22, 95% CI = [-0.61, 3.05], p < 0.19). Although statistically not significant, however OE was associated with less anastomosis leak (RR=0.84, 95% CI = [0.70, 1.02], p = 0.07) and chyle leak(RR=0.89, 95% CI = [0.45, 1.75], p = 0.73). The results found were mostly homogenous.

Conclusion: Both OE and HMIE had their advantages and drawbacks respectively. Compared with the OE, HMIE shows less conduit necrosis, post operative pneumonia and recurrent laryngeal nerve paralysis. On the contrary, OE shows less anastomosis leak and chyle leak.

Finally, the decision between OE and HMIE should be made on an individual patient profile based on specific needs. Further studies might be necessary to evaluate the long-term oncologic outcomes of OE and HMIE.

Keywords

Open esophagectomy, Hybrid minimally invasive esophagectomy, Esophageal cancer, Conduit necrosis, Anastomosis leak, Chyle leak.