

**Methods:** This ongoing phase II trial (NCT03736863) in six sites in China enrolled pts aged 18-75 with unresectable locally advanced, locally recurrent, or metastatic ESCC that progressed or were intolerant after first-line chemotherapy, and an ECOG performance status of 0-1. Pts received 200 mg camrelizumab intravenously every 2 weeks and apatinib 250 mg orally once per day in 4-week cycles until disease progression, unacceptable adverse events (AEs) or withdrawal of consent. The primary endpoint was investigator-assessed ORR. Secondary endpoints included disease control rate (DCR), progression-free survival (PFS) and OS.

**Results:** At data cutoff (Feb 28, 2021), 52 pts were enrolled, including 42 males and 50 with distant metastases, with the median age of 62 years. In the evaluable population of 39 pts, ORR without confirmation was 43.59% and DCR was 94.87%. The median duration of response was 6.9 months (95% CI 4.57–9.23). The median PFS was 6.8 month (95% CI 2.66–10.94). The 12-month overall survival was 52.2%. A total of 80.8% of pts had treatment-related AEs (TRAEs) with 46.2% of grade ≥ 3 TRAEs. The safety profile of camrelizumab and apatinib was consistent with other anti-PD-1 antibodies and angiogenesis inhibitors.

**Conclusion;** This is the first study that evaluates the combination anti-PD-1 antibody and anti-angiogenesis inhibitor as a second-line therapy for advanced ESCC. Camrelizumab plus apatinib showed encouraging clinical efficacy and acceptable safety. Further phase III randomized trials are warranted.

661 EFFICACY OF ROBOT ASSISTED MINIMALLY INVASIVE ESOPHAGECTOMY: PROPENSITY MATCHED ANALYSIS OF RAMIE IN COMPARISON WITH CONVENTIONAL MIE

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Robot assisted minimally invasive esophagectomy (RAMIE) has been reported to be potential advantages in previous reports. Here we demonstrate the difference between these two minimally invasive procedures and investigated the surgical results of RAMIE in comparison with MIE using propensity matched-cohort.

**Methods:** We investigated 154 cases of thoracic esophagectomy conducted between 2020/1 to 2021/1. Among these cases, we analyzed 30 cases of RAMIE in comparison with 30 cases of matched-cohort which conducted conventional thoracoscopic esophagectomy (MIE) in the prone. Then we evaluated the surgical results between two groups.

**Results:** There were no differences in age (69.2 vs 69.1 yo), gender (M:F = 24:6 vs 24:6), cStage (Stage I,II,III,IV:6,3,14,7 vs 8,3,14,5), and preoperative chemotherapy (70% vs 66.7%) between RAMIE and matched-cohort MIE. There was statistically significant difference in total time of thoracic phase (233.1 vs 173.3 min; p < 0.01). There were no significant differences in postoperative events in RAMIE vs MIE (Clavien-Dindo Grade I≥; Recurrent laryngeal nerve paralysis (RLNP) (16.7 vs 20.0%; p = 0.19). However, after the learning curve archived, seldom cases were diagnosed postoperative RLNP in RAMIE cases in comparison with MIE (p = 0.06).

**Conclusion:** We demonstrated the formalization of our procedure and surgical results of RAMIE. There were no significant differences in postoperative events between two groups. However RLNP was lower after the learning peak. Incidence of RLNP could be reduced in RAMIE.

662 MICROVASCULAR MYOCUTANEOUS AND CUTANEOUS FREE FLAP RECONSTRUCTION FOR PATIENTS WITH TERMINAL ESOPHAGOSTOMY AFTER COMPLICATED ONCOLOGICAL ESOPHAGUS RESECTION

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Persisting anastomotic leak after oncological esophagectomy is a severe problem associated with high mortality and morbidity. Unfortunately, treatment options with promising results are scarce especially when conventional operative and endoscopic methods have failed. Due to limitation of oral

Table 1. Complication according to Clavien-Dindo-Classification

Clavien-Dindo-Classification	Complications	Total number of patients
0		1
II	Delirium	1
IIla	2x Stenting Endoscopic dilation	3
IIlb	2x Surgical revision	2
		7

intake and need for artificial nutrition quality of life is reduced. Microvascular myocutaneous and cutaneous free flap (MFF) reconstruction could be a promising alternative.

**Methods:** This retrospective cohort study presents seven patients treated between March 2017 and November 2020 at our surgical department, with terminal esophagostomy after complicated oncological esophagus resection without further feasible treatment options. All Patients received anastomotic MFF reconstruction. We have examined postoperative outcomes, complications according to Clavien-Dindo-Classification and patient contentment with a questionnaire. Additionally, we described important procedure related facts.

**Results:** The included seven male patients had median age of 65.15 years (range: 48–75). MFF function was adequate in six out of seven patients, graft rejection appeared in one patient. Five patients initially had good results, surgical revision was performed in one patient to ensure graft function. Post-operative complications appeared in 6/7 patients (Table 1). Mean duration of inpatient care was 63 days (Range: 24–156). At time of evaluation, one patient has died cancer related. No more additional nutrition was needed in 3/6 patients with adequate graft function. The majority of patients reported an improved quality of life compared to preoperatively.

**Conclusion:** MFF free flap can be a safe and feasible treatment option for patients with terminal esophagostomy after complicated oncological esophagus resection without further treatment options or in patients with complicated postoperative course with complex combined defects. The renewed ability of oral food intake results in a significant improvement of quality of life for the patients. No procedure related mortality was observed. Number of patients with regained ability of oral intake is encouraging.

663 QUANTITATIVE PERFUSION ASSESSMENT TO PREDICT ANASTOMOTIC LEAK AFTER ESOPHAGECTOMY

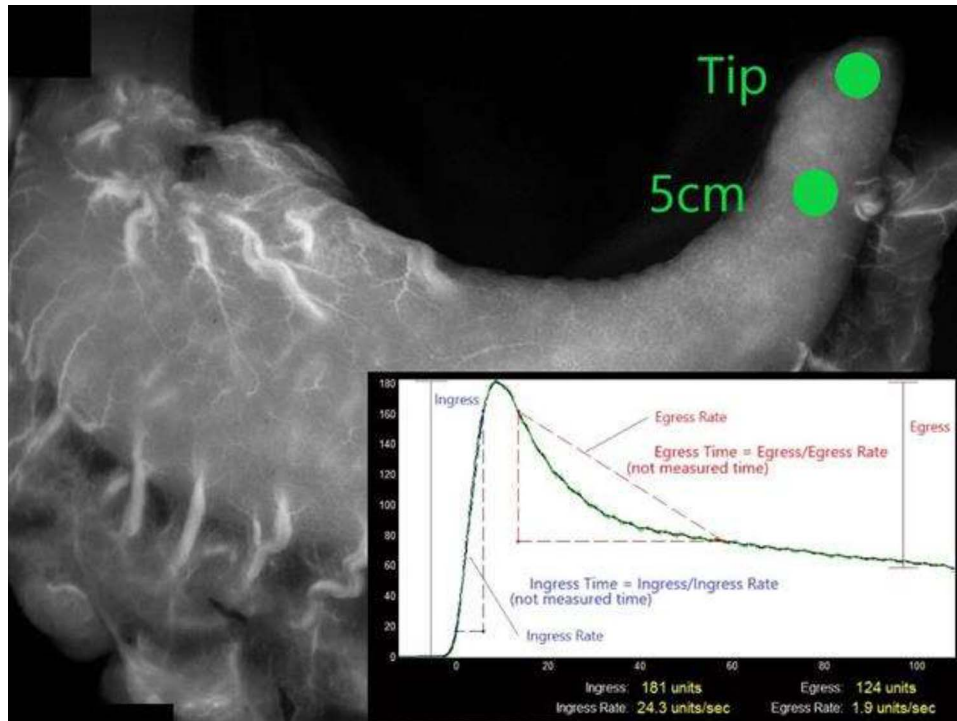
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Impaired gastric conduit perfusion is a risk factor for anastomotic leak after esophagectomy. Most studies evaluating conduit perfusion have been qualitative with limited impact on post-operative care. The aim of this study is to evaluate the feasibility of intraoperative quantitative assessment of gastric conduit perfusion with indocyanine green (ICG) fluorescence angiography as a predictor for cervical esophagogastric anastomotic (CEGA) leak after esophagectomy.

**Methods:** ICG fluorescence angiography using the SPY elite® (Stryker, MI, USA) system was performed in patients who had undergone a transhiatal or McKeown esophagectomy CEGA from July 2015 through December 2020. Fluorescence angiography assessed Ingress (dye uptake) and Egress (dye exit). Ingress Index, Ingress Time, Egress Index, and Egress Time at two anatomic landmarks (tip of the conduit, and 5 cm from tip) were calculated from the measured curve of fluorescence (Figure). The collected data between the leak (L) group and the no-leak (NL) group were compared by both univariate and multivariable analyses to analyze risk factors potentially associated with CEGA leak.

**Results:** 304 patients were evaluated. There was no significant difference in patients' demographic and post-operative complications between the groups



(L n = 73; NL n = 231), except for anastomotic stricture (42.5 vs 9.1%,  $p < 0.01$ ). 5 cm and Tip Ingress Index were significantly lower in L (35.0 vs 45.1% and 17.4 vs 25.7%,  $p < 0.01$ ). 5 cm Ingress Time was significantly higher in L (70.6 vs 56.8 sec,  $p < 0.01$ ). On multivariable analysis, these variables retained statistical significance, suggesting that these three variables can be used to predict future leak.

**Conclusion:** This study revealed that gastric conduit perfusion correlates with the incidence of CEGA leak. Intraoperative measurement of gastric conduit perfusion may be predictive for CEGA leak following esophagectomy. These variables can be easily collected intraoperatively with the SPY study and used to make clinical decisions which may avert CEGA leak.

#### 664 BURDEN OF IN-HOSPITAL CARE IN OESOPHAGEAL CANCER: A NATIONAL POPULATION-BASED STUDY

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Oesophageal cancer management requires extensive in-hospital care. This cohort study aimed to quantify in-hospital care for esophageal cancer patients in relation to intended treatment and to analyze factors associated with risk of spending a large proportion of survival time in hospital.

**Methods:** All patients with oesophageal cancer in three nationwide registers over a ten-year period, were included. In-hospital care during the first year after diagnosis was evaluated and the proportion of survival time spent in hospital, stratified for intended treatment (curative, palliative or best supportive care) calculated. Associations of relevant factors to a greater proportion of survival time in hospital was analyzed by multivariable logistic regression.

**Results:** In-hospital care was provided for a median time of 39, 26 and 15 days the first year after diagnosis of oesophageal cancer for curative, palliative and best supportive care groups respectively. Patients receiving curatively intended treatment spent a median of 12% of their survival time in hospital

during the first year after diagnosis, while palliative or best supportive care patients spent 19% and 23% respectively. Factors associated with more in-hospital care included higher age, female sex, being unmarried and chronic obstructive pulmonary disease (COPD).

**Conclusion:** The burden of in-hospital care during the first year after diagnosis of oesophageal cancer was substantial. Important clinical and socioeconomic factors were identified that predisposed to a greater proportion of survival time spent in hospital.

#### 665 PROPHYLACTIC THORACIC DUCT OBSTRUCTION DURING ESOPHAGECTOMY: THE IMPACT ON PERIOPERATIVE RISKS AND LONG-TERM SURVIVAL. A SYSTEMATIC REVIEW AND META-ANALYSIS

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During esophagectomy for cancer, there is no consensus if prophylactic thoracic duct ligation (TDL), with or without thoracic duct resection (TDR), could influence the perioperative outcomes and long-term survival. This systematic review and meta-analysis compared patients who went through esophagectomy associated or not to ligation or resection of the thoracic duct.

**Methods:** A systematic review was conducted in PubMed, Embase, Cochrane Library Central and Lilacs (BVS). The inclusion criteria were: (1) studies that compare thoracic duct ligation, with or without resection, and non-thoracic duct ligation; (2) involve adult patients with esophageal cancer; (3) articles that analyses the outcomes—perioperative complications, perioperative mortality, chylothorax development and overall survival; (4) only clinical trials and cohort were accepted. A 95% confidence interval (CI) was used, and random-effects model was performed.

**Results:** Fifteen articles were selected, comprising 6,249 patients. TDL did not reduce the risk for chylothorax (Risk difference [RD]: -0.01; 95%CI: -0.02, 0.00). Also, TDL did not influence the risk for complications (RD: -0.02; 95%CI: -0.11, 0.07); mortality (RD: 0.00; 95%CI: -0.00, 0.00); and reoperation rate (RD: -0.01; 95%CI: -0.02, 0.00). TDR was associated with higher risk for postoperative complications (RD: 0.1; 95%CI 0.00, 0.19);