

# SALVAGE ESOPHAGECTOMY – SINGLE ONCOLOGICAL CENTER EXPERIENCE

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## Background

Esophageal cancer is the sixth leading cause of cancer-related death in the Brazilian male population and its incidence is increasing over the last decades. In our country, tumors are frequently diagnosed at advanced stage and the combination of neoadjuvant chemoradiotherapy (NCR) and surgery is considered the gold standard treatment for patients with localized potentially resectable disease. However, a significant proportion of patients presents with poor performance status (PS) or with local advanced cancer. In this setting, definitive chemoradiotherapy (DCR) is an alternative treatment to surgical resection. However, residual or recurrent disease after DCR occurs in 40-75% of patients and, for them, salvage esophageal resection may be an option for curative treatment. Nevertheless, salvage esophagectomies are associated with high rates of postoperative morbidity and mortality, and poor long-term outcomes. Therefore, we conducted a retrospective analysis to evaluate the short-term outcomes and survival of patients submitted to salvage esophagectomy (SE) for persistent disease or recurrence after DCR in our referral oncological center.

## Results

Twenty-nine patients were included in this retrospective analysis. The patient characteristics and primary treatment are summarized in Table 1. Most patients were male, with a middle-third thoracic esophagus squamous cell carcinoma, and the most prevalent primary treatment was DCR. The salvage esophagectomy results are detailed in Table 2 and 3. Most resections were performed with a transthoracic approach (83%) (Figure 1). Only 6 (21%) procedures performed in a minimally invasive technique. The surgical morbidity was high (83%), with respiratory conditions the most common complication (48%). There were 3 postoperative deaths (10%). Most procedures resulted in R0 resections (86%). The follow-up data were available for 25 patients. The median overall survival was 20 months and the estimated 5-year survival was 15% (Figure 2).

## Discussion

SE is usually defined as surgery done in patients treated with DCR and latter identified as having locoregional recurrence or persistent disease. There are many publications, most of it small retrospective series, that described the feasibility and the short-term outcomes after SE. A recent systematic review including 954 patients and eight studies compared the short-term clinical outcomes following SE for the treatment of esophageal cancer. The authors concluded that SE following DCR was associated with an increase in postoperative mortality, anastomotic leak, pulmonary complications and length of hospital stay. In this way, our retrospective single center results also showed that SA was associated with high incidence of pulmonary complications, anastomotic failure, conduit necrosis and postoperative mortality.

In fact, SE is a challenging procedure. In general, after DCR patients presents with decrease in PS, because of the deterioration in cardiac and pulmonary functions caused by the toxic side effects of the regimen. Besides, the high radiation dose and the long-time interval between DCR and surgery leads to intense mediastinal fibrosis causing extra technical difficulty during the thoracic dissection of the esophagus and mediastinal lymph nodes. Another point is the exposure of the proximal stomach to high radiation doses may jeopardize the gastric perfusion and contribute to increase the incidence of anastomotic failure, conduit necrosis and, consequently, mortality after SE. Indeed, our three perioperative deaths were related to anastomotic leak and conduit necrosis despite the aggressive treatment instituted. Because of the high toxicity associated with SE described above, patients presenting with recurrent or residual disease after DCR must be discussed in multidisciplinary tumor boards and the surgical procedure must be reserved for patients with good PS and for whom curative resection is expected. Moreover, the procedure must be undertaken in high-volume centers by experienced esophageal surgeons.

Table 1 – Patient clinical characteristics

<b>Gender</b>	
Male	23 (79%)
Female	6 (21%)
<b>Age (years)</b>	
Mean	61
Range	40 - 72
<b>Tobacco Use</b>	27 (93%)
<b>Alcohol Use</b>	18 (62%)
<b>ECOG PS</b>	
0	2 (7%)
1	25 (86%)
2	2 (7%)
<b>BMI (kg/m<sup>2</sup>)</b>	
Mean	23,3
Range	17,5 - 29,4
<b>Albumin (g/dl)</b>	
Mean	4,2
Range	3,6 - 4,9
<b>Tumor Histology (%)</b>	
SCC	25 (86%)
Adeno	4 (14%)
<b>Tumor location (%)</b>	
Upper	2 (7%)
Middle	19 (66%)
Lower	5 (17%)
EGJ	3 (10%)
<b>Clinical Staging</b>	
IIA	2 (8%)
IIB	14 (58%)

Table 2 – Operative procedures

<b>Indication</b>	
Residual disease	19 (66%)
Recurrent disease	10 (34%)
<b>Interval RCT to surgery (weeks)</b>	
Mean	47
Range	4 - 119
<b>Surgical Approach</b>	
Transthoracic	24 (83%)
Transhiatal	5 (17%)
<b>Minimally Invasive technique</b>	6 (21%)
<b>Operative time (min)</b>	
Mean	392
Range	240 - 700
<b>Perioperative Transfusion</b>	5 (17%)
<b>ICU stay (days)</b>	
Mean	11,2
Range	2 - 58
<b>Postoperative complications</b>	24 (83%)
Respiratory	14 (48%)
Anastomotic dehiscence	10 (34%)
Gastric conduit necrosis	2 (7%)
<b>Reoperation (%)</b>	5 (17%)
<b>Hospital Stay (days)</b>	
Mean	27
Range	8 - 58
<b>Postoperative mortality</b>	3 (10%)

Table 3 – Histopathological results

<b>pCR</b>	5 (17%)
<b>Lymph node count (n)</b>	
Mean	14
Range	2-48
<b>Surgical Margins</b>	
R0	25 (86%)
R1	1 (4%)
R2	3 (10%)
<b>Pathological Stage (%)</b>	
0	5 (17%)
IB	2 (7%)
IIA	7 (24%)
IIB	8 (28%)
IIIA	4 (14%)
IIIB	1 (3%)
IV	2 (7%)

Overall Survival

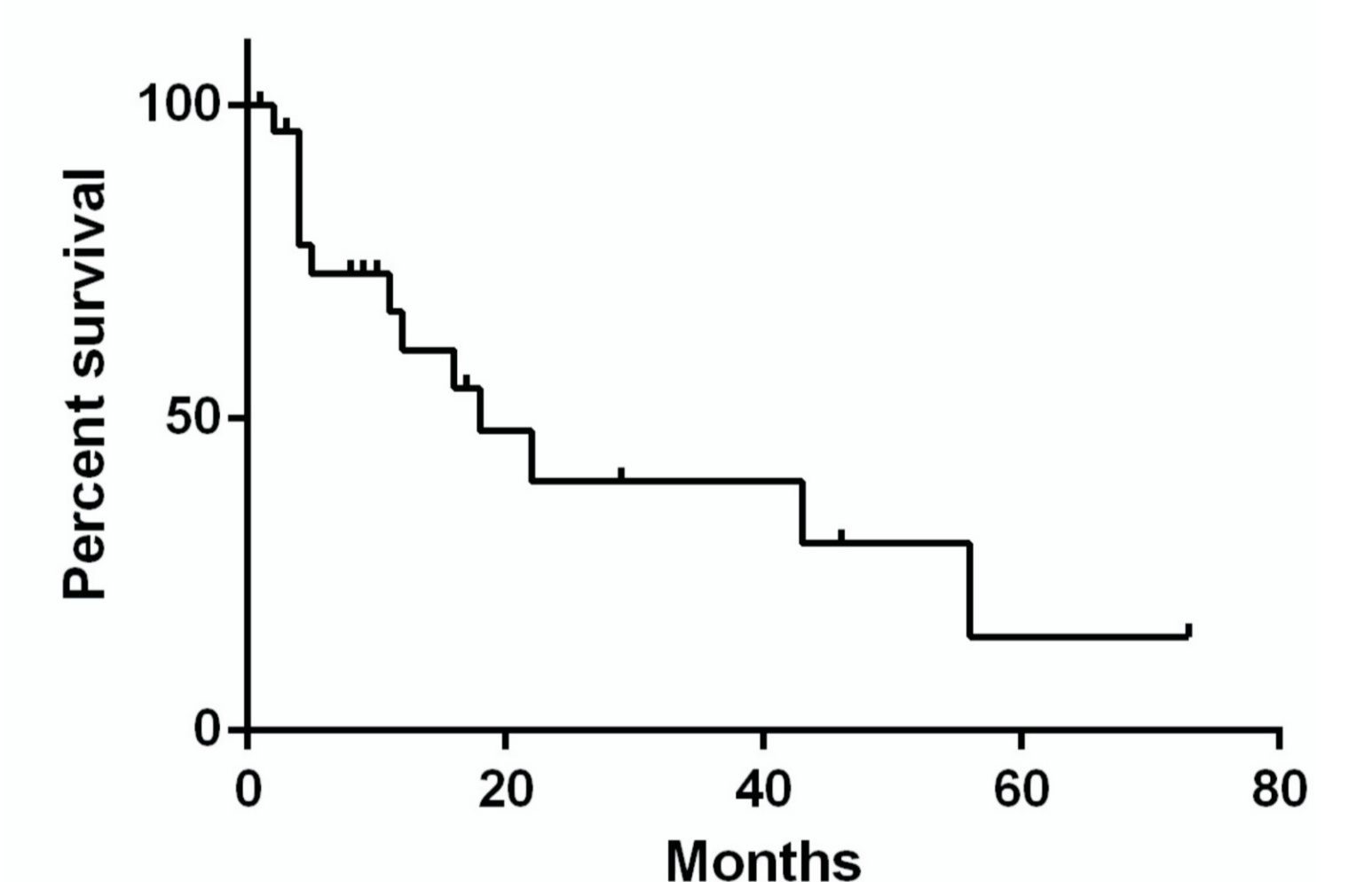


Figure 1 – Kaplan-Meier plot for overall survival after salvage esophagectomy



Figure 2 – Thoracoscopic view during salvage esophagectomy showing intense fibrosis of the mediastinum in the irradiated area

## References

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