

Introduction

In recent years, surgeons and gastroenterologists have explored the use of esophageal stents in the management of esophageal stricture, perforation, post-esophagectomy anastomotic leak and leak following vertical sleeve gastrectomy (VSG).^{1,2} Stents are placed as an alternative to invasive surgery and allow for exclusion of the foregut defect, aiding in healing and limiting continuous contamination of pleural or peritoneal cavities.

Complications associated with stent placement include dysphagia, stent erosion, reflux, and stricture formation.³ It is believed that prolonged stent use increases these risks. There is no consensus for the ideal time for metal stent removal, optimizing therapeutic effect of stenting while reducing the risk of stent associated complications.

Objectives

1. To investigate outcomes of covered self-expanding metal esophageal stent placement in the management of benign esophageal strictures and proximal foregut defects.
2. To determine variances in outcomes according to stent time to removal.

Methods

Retrospective analysis was completed on patients who underwent placement of covered self-expanding metal esophageal stents at a single institution from 2010 to 2018. Patients who received esophageal stents for benign esophageal strictures including anastomotic stricture, or foregut defects including esophageal perforation, post-esophagectomy anastomotic leak, and proximal staple line leak following vertical sleeve gastrectomy (VSG) were included. Esophageal stent placement for malignant obstruction or malignant perforation were excluded.

All stents were either partially covered or fully covered metal stents. Complications, recurrence of symptoms, mortality, and need for definitive surgical therapy following stent placement were compared according to time to stent removal.

Outcomes were compared among groups, and analyzed using Student's *t*-test and Fisher's exact test where appropriate. Stent related complications were evaluated according to time of removal, and analyzed using Chi-square test. Statistical significance was set at *p*-value of less than 0.05.

Results

A total of 40 patients underwent placement of 49 stents with with distribution as displayed in *Figure 1*. Overall 30-day mortality rate was 6.3%. Stent migration was observed in 8 (16.3%) cases. Four (8.2%) patients required operative intervention following stent placement, all within the foregut defect group (*p* <0.05). Six patients (12.2%), expired with esophageal stent in place.

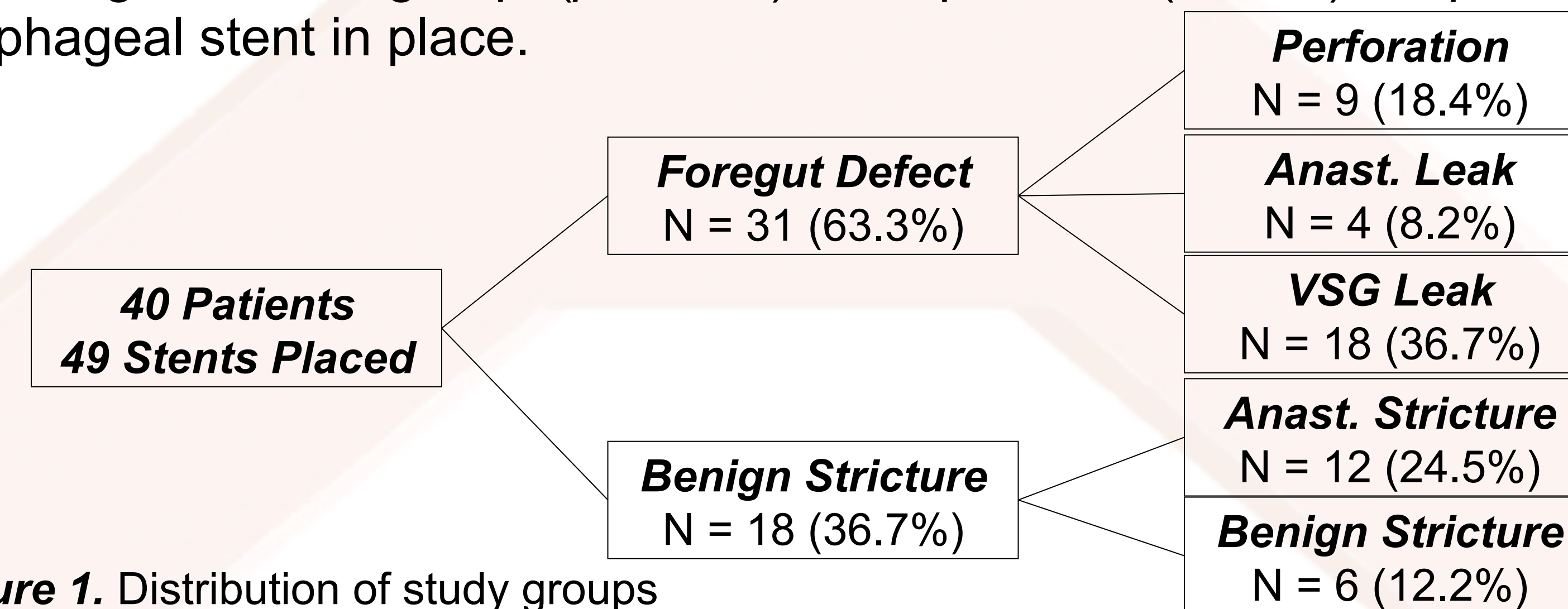


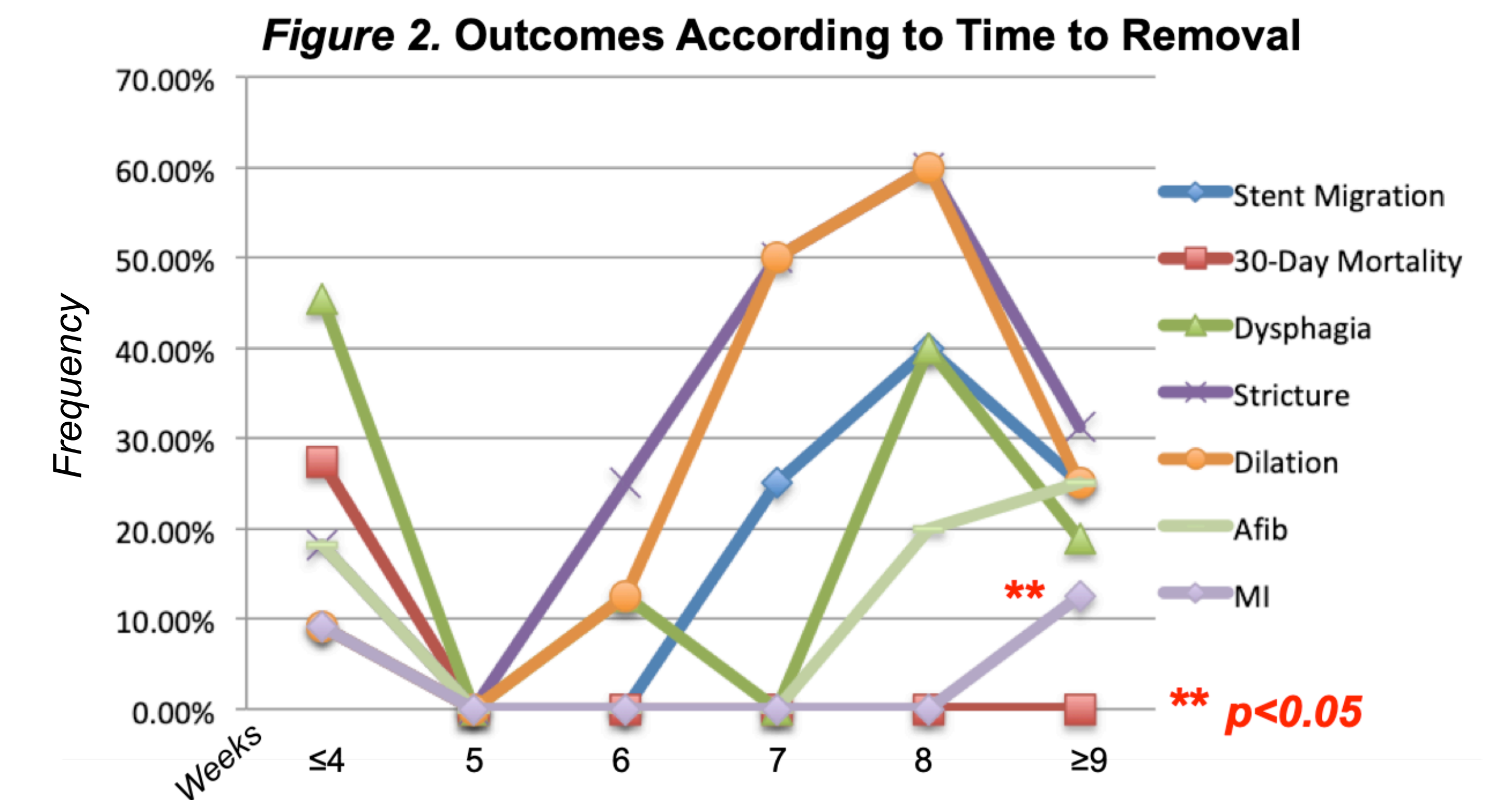
Figure 1. Distribution of study groups

A higher proportion of patients with benign strictures experienced dysphagia (*p*<0.05) and pain (*p*<0.05) with stent in place compared to patients with foregut defects. Patients with benign strictures were more likely to experience stricture after stent removal (*p*<0.05) and undergo dilation (*p*<0.05). Unsurprisingly, 30-day mortality was higher for patients receiving esophageal stents for foregut defects, compared to benign stricture (*p*<0.05).

Table 1. Outcomes according to group	Foregut Defect	Benign Stricture	<i>p</i> -value
Mean Time to Removal	67.7	126.2	0.23
Stent Migration Rate	4 (12.9%)	4 (22.2%)	0.44
30-Day Mortality Rate	3 (9.8%)	0 (0%)	0.04
Dysphagia ^a	3 (9.8%)	9 (50.0%)	0.04
Stricture Post Removal	3 (9.8%)	11 (61.1%)	<0.01
Fistula Post Removal	4 (12.9%)	1 (5.6%)	1.00
Dilation Post Removal	2 (6.5%)	8 (44.4%)	<0.01
Repeat Stent	3 (9.8%)	5 (27.8%)	0.04
Stent Erosion	6 (10.4%)	1 (5.6%)	0.41
Pulmonary Embolism ^a	2 (6.5%)	0 (0%)	0.53
Atrial Fibrillation ^a	6 (19.4%)	1 (5.6%)	0.24
Respiratory Failure ^a	8 (25.8%)	4 (22.2%)	1.00
Myocardial Infarction ^a	2 (6.5%)	1 (5.6%)	1.00
Pneumonia ^a	4 (12.9%)	4 (22.2%)	0.44

Results Cont.

Among all variables, there is an observed increase in morbidities and stent-related complications at 5 weeks, without statistically significant difference. In all cases, stent removal after 9 weeks was associated with an increased risk of cardiac events (*p*<0.05) (*Figure 2*).



Afib - atrial fibrillation; MI - myocardial infarction; ^aOutcomes measured with stent in place. Remainder of outcomes were evaluated following stent removal.

Conclusions

Self-expanding metal esophageal stent placement for management of benign esophageal strictures and foregut defects is a safe alternative to invasive surgical therapy. Patients undergoing self-expanding metal esophageal stent placement for benign esophageal stricture are likely to experience recurrence of symptoms after stent removal. In such cases, alternative therapies should be considered. Previously published literature recommends removal of esophageal stents for benign disease 2 to 4 weeks from placement to decrease the risk of stent-related complications.⁴ Our results suggest self-expanding metal esophageal stents may remain in place for up to 9 weeks without clinically significant complications.

References

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