



Survival and functional outcomes of patients with locally advanced laryngeal squamous cell carcinomas (SCC) treated with surgery followed by adjuvant treatment: A 15-year experience of a tertiary hospital in Singapore

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Background

- The management of locally advanced laryngeal SCCs is an ever-changing paradigm, since the Veteran Affairs Larynx Cancer Study Group¹ published their landmark paper in 1991.
- The choice of total laryngectomy versus larynx-preserving chemoradiation protocols depend on the patient’s ability to undergo major oncological surgery, the residual laryngeal function, the presence of major cartilage involvement as well as patient’s wishes.
- Our multidisciplinary team and patients alike are very much interested in our cure rates, as well as the ability to retain a good quality of life after treatment.
- As a follow up to our results published in 2016², we performed a retrospective database review to study the outcomes of patients treated with surgery followed by adjuvant therapy in the past 15 years.

Objectives

1. Our primary objectives are to determine overall and disease-free survival of our patients, as well as the factors affecting their survival.
2. Our secondary objectives are to determine functional impact of laryngectomy on these patients, in their ability to regain functional speech and swallowing.

Methods

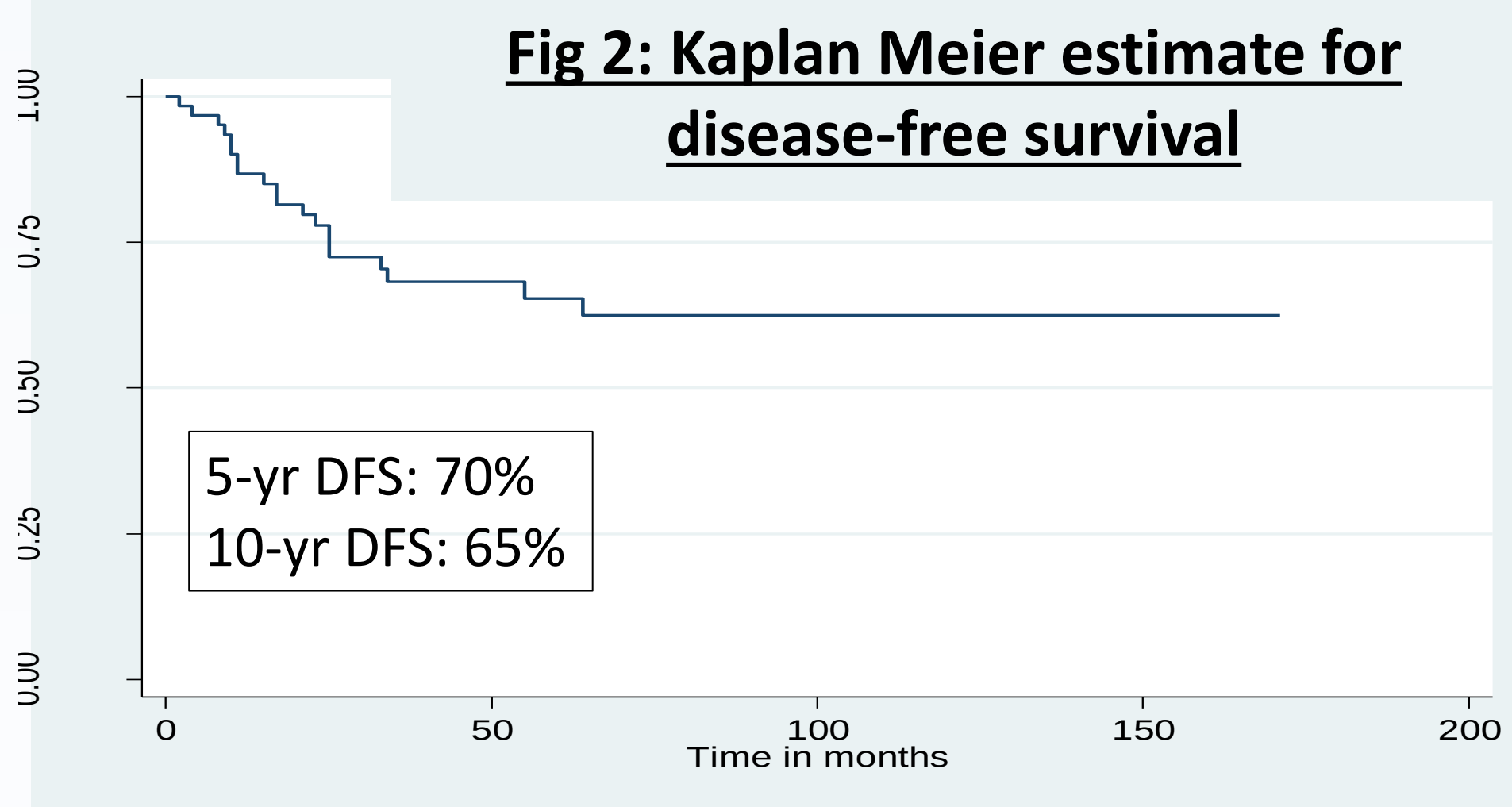
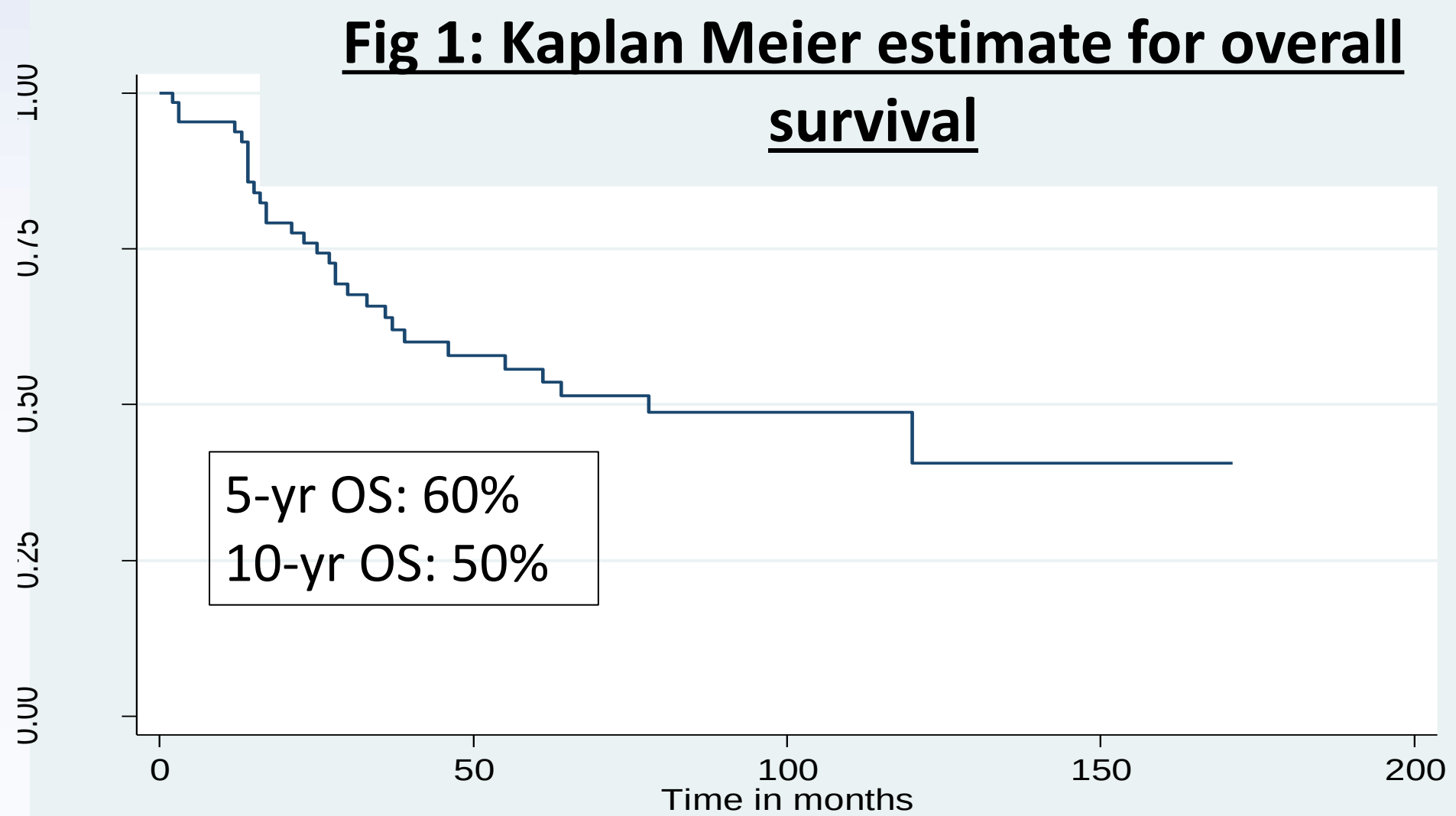
- Institutional review board approval was obtained. We reviewed medical records of patients who underwent total laryngectomy or pharyngo-laryngectomy in our hospital between 2006 and 2020. Patients with primary and recurrent laryngeal SCC were included, whereas those with hypopharyngeal SCCs or whose surgeries were performed for non-cancer related disease were excluded.
- Clinicopathologic data such as patient demographics, American Joint Cancer Committee (AJCC) stage, margin status, presence of lymphovascular invasion (LVI) or perineural invasion (PNI) were collected. Patients diagnosed before 2017 were re-staged using the AJCC 8th Edition staging system.

Statistical analysis

- Data was cleaned and analyzed using SPSS v26.0 and STATA v16.0.
- Cox regression analysis was used to explore the prognostic factors related to disease recurrence and death. The variables with p value < 0.200 were included into the selection process for multivariable analysis. Stepwise variable selection method was used. Statistical significance was denoted as p<0.05.

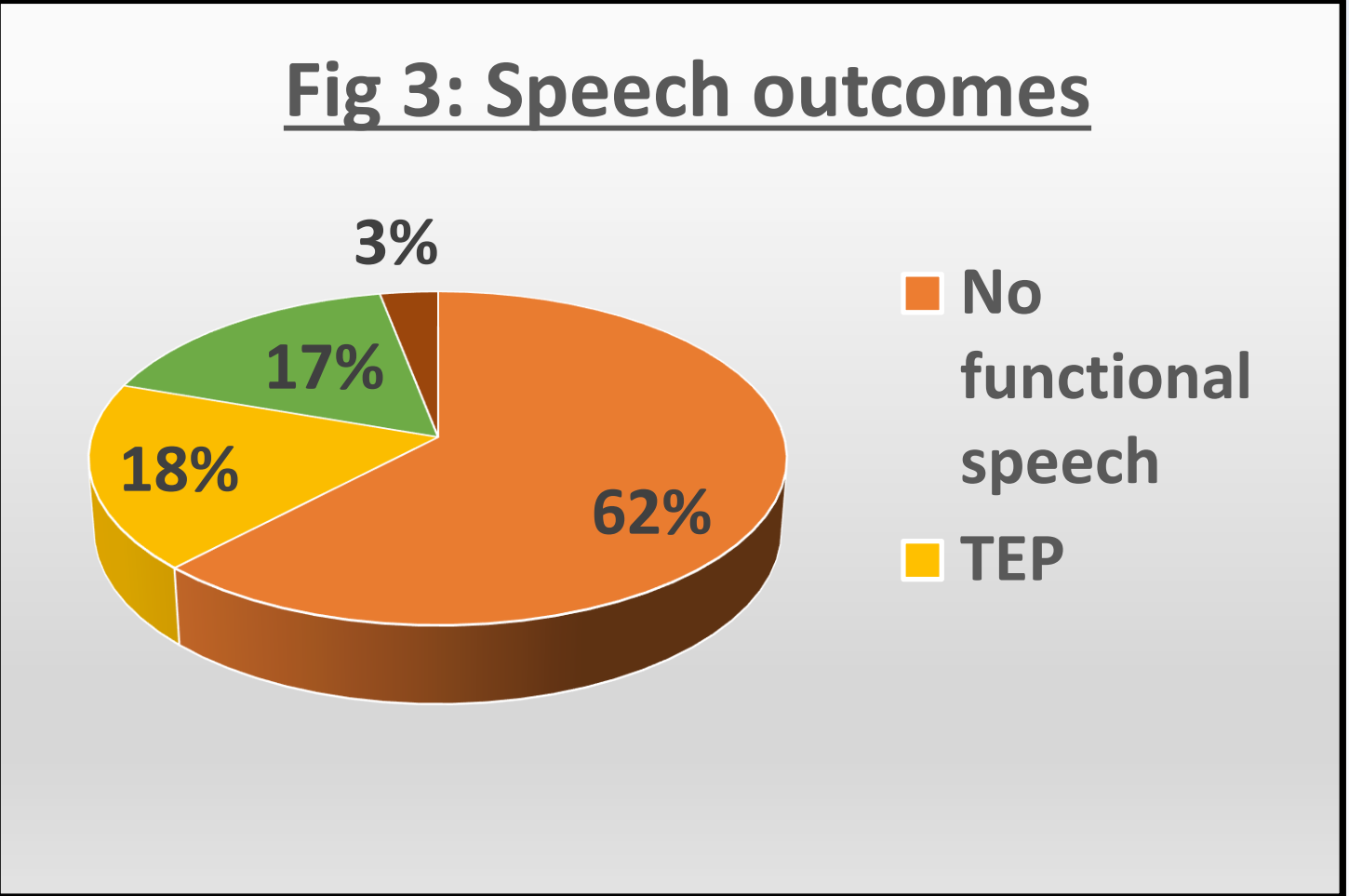
Table 1: Characteristics of patients in the study

Patient Demographics		Frequency (%)
Age in years, mean ± SD		64.06 ± 9.33
Sex, n (%)	Male	64 (97.0)
Race, n (%)	Chinese	54 (81.8)
	Malay	7 (10.6)
	Indian	5 (7.6)
Disease Characteristics		
Subsite, n (%)	Glottis	29 (43.9)
	Supraglottis	35 (53.0)
	Subglottis	2 (3.0)
Histological diagnosis, n (%)	SCC	64 (97.0)
	Poorly differentiated SCC	2 (3.0)
Clinical T stage, n (%)	2	4 (6.1)
	3	16 (24.2)
	4	46 (69.7)
Clinical N stage, n (%)	0	34 (51.5)
	1	4 (6.1)
	2	20 (30.3)
	3	8 (12.1)
Clinical stage (AJCC 8 th Ed), n (%)	II	3 (4.5)
	III	12 (18.2)
	IV	51 (77.3)
Intent of surgery, n (%)	Primary	53 (80.3)
	Salvage	13 (19.7)
Operative Characteristics		
Primary operation, n (%)	Partial pharyngo-laryngectomy	8 (12.1)
	Total laryngectomy	48 (72.7)
	Total pharyngo-laryngectomy	10 (15.2)
Reconstruction, n (%)	None	45 (68.2)
	Free ALT flap	12 (18.2)
	Free ileocolic flap	1 (1.5)
	Free vastus lateralis flap	1 (1.5)
	Pedicled flaps	7 (10.6)
Completed adjuvant treatment, n (%)		41 (77.3)



Results

- 66 patients were identified and included in this study. The mean duration of follow up was 51.2 months. The patients’ characteristics are summarized in Table 1.
- The Kaplan-Meier survival curves are shown in Figures 1 and 2. On stepwise Cox regression multivariable analysis, the poor prognostic factors for survival were:
 1. Poorly differentiated SCC (HR 11.001, 95% CI 2.257-53.628, p<0.05)
 2. Extranodal extension (HR 3.550, 95% CI 1.415-8.903, p<0.05)
 3. Higher nodal staging (cN3: HR 6.445, 95% CI 1.328-31.283, p<0.05)
 4. Lymphovascular invasion (HR 2.640, CI 1.022-6.824), p<0.05)



- 38% of our patients had functional speech (Fig 3), while 85% of our patients retained oral feeding, defined as the ability to swallow soft foods or better (Fig 4).

Discussion

- Although earlier trials³⁻⁴ shifted the treatment paradigm towards larynx preservation, our study shows that laryngectomy with adjuvant therapy still remains an equally successful modality of treatment with comparable survival rates.
- The rate of long term tube feeding remained acceptable at 15%, a favourable outcome that is directly attributable to standard-of-care surgical and reconstruction techniques. This is comparable to the 10-year results published by the RTOG in 2013⁵.
- As we advance as a tertiary head and neck surgery unit, we hope to improve functional speech outcomes for our patients by focusing on adequate preoperative counselling, intensive postoperative speech rehabilitation, in particular, raising the TEP uptake rate among our patients.

References:

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