

Treatment outcome comparison between 33 versus 35 fractions among nasopharyngeal carcinoma using helical approach: A retrospective study

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Background and Objective

To compare the treatment outcome in terms of survival, treatment related side effects and treatment response of 33 fractions with simultaneous intensity modulated boost (SIMB) versus sequential 35 fractions using helical approach among nasopharyngeal carcinoma patients.

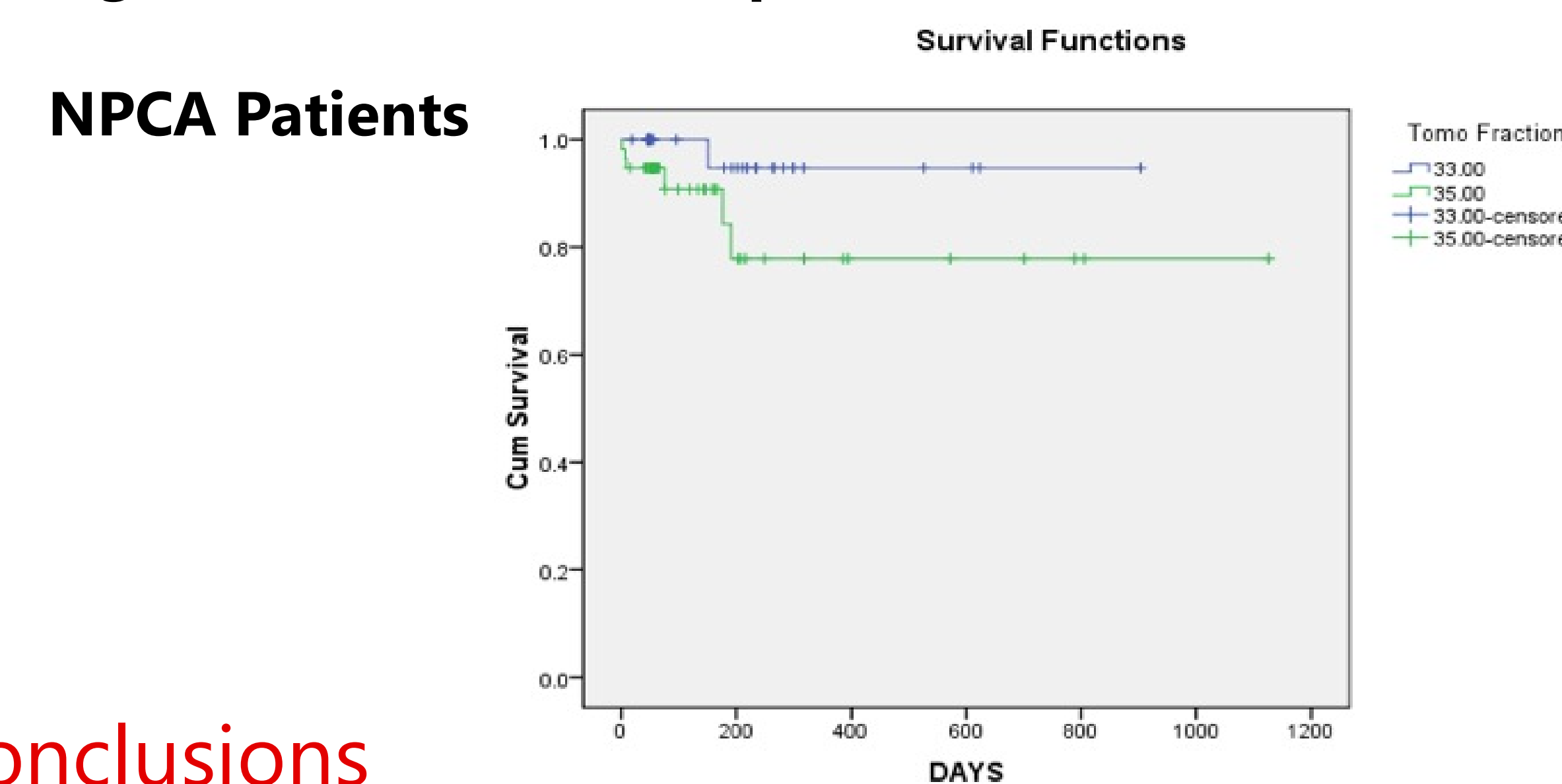
Methods

From September 2014 to September 2018, a total of 91 patients diagnosed with nasopharyngeal carcinoma were treated with either 33 fractions with SIMB (n=34) and sequential 35 fractions (n=57) using image guided intensity modulated radiotherapy (IG-IMRT) helical approach concurrently with chemotherapy at the Central Luzon Integrated Oncology Center (CLIOC) and were followed up for four years. All were histopathologically confirmed undifferentiated and squamous cell type. Targets were defined as GTV=70Gy, CTV66 = 66Gy, CTV60=60Gy and PTV (target + 3mm) at 200 cGy per fraction. Daily megavoltage computed tomography was done and organ at risk were define with tolerance dose based on QUANTEC. Side effects were recorded based on common toxicity grading (CTC) ver 2.0. Patients were followed up using magnetic resonance imaging (MRI) every three months on the first year, every six months on second year and every year on the third year onwards.

Results and Discussion

There was no statistically significant difference in terms of clinical profile for patients treated with 33 fractions compared to 35 fractions. Patients who received 33 fractions showed no statistically significant difference in terms of survival time compared with 35 fractions (863 days vs 903 days, p = 0.085). Four-year survival rate was higher in the 33 fractions compared to the 35 fractions group, 97.1% vs 89.5% respectively (Fig. 1) but not statistically significant. No statistically significant difference was noted in the proportion of patients who reported treatment related side effects such as xerostomia, ageusia, dysphagia, mucositis and skin desquamation among 33 and 35 fractions (Fisher's exact test p-values > 0.05)[Table 1]. although the mean time to event was shorter in the 33 fractions group. Treatment response showed 41.2% vs 35.1% improved, 8,8% vs 7% no improvement and 5.9% vs 1.8% re-treatment for 33 and 35 fractions respectively and found no significant difference (p value 0.511) [Table 2].

Figure 1. Plots of Kaplan-Meier Estimates of Survival of NPCA Patients



Conclusions

The study presents 33 fractions with SIMB using IG-IMRT helical approach may be a practical option in treating nasopharyngeal carcinoma and it showed comparable results in terms of survival, treatment related side effect and response compared with the standard 35 fractionation.

Table 1. Incidence and occurrence of side effects among NPC

Side effects	Patients with side effect			Time to Occurrence of side effect (in days)				Log Rank Test (Mantel-Cox) p-value
	33 n (%)	35 n (%)	Fisher's exact test p-value	33		35		
				Mean	95% CI	Mean	95% CI	
Xerostomia	15 (44.1%)	28 (49.1%)	0.670	59.0	[45.0, 73.0]	104.1	[78.7, 129.6]	0.523
Dysphagia	14 (41.2%)	24 (42.1%)	1.000	63.1	[49.8, 76.4]	119.7	[95.0, 144.5]	0.860
Mucositis	14 (41.2%)	25 (43.9%)	0.830	63.6	[50.5, 76.7]	116.2	[91.3, 141.0]	0.664
Aguesia	10 (29.4%)	20 (35.1%)	0.649	71.1	[58.1, 84.1]	132.4	[107.8, 157.1]	0.488
Dry desquamation	14 (41.2%)	16 (28.1%)	0.251	47.3	[40.6, 54.0]	150.5	[128.9, 172.1]	0.185
Wet desquamation	6 (17.6%)	14 (24.6%)	0.602	83.5	[74.4, 92.5]	156.6	[135.8, 177.5]	0.394

Tomo Fraction	Outcome					p-value (likelihood ratio test)
	Improved	Died	No improvement	Re-RT	Lost to follow-up	
33 (n = 34)	14 (41.2%)	1 (2.9%)	3 (8.8%)	2 (5.9%)	14 (41.2%)	0.511
35 (n = 57)	20 (35.1%)	6 (10.5%)	4 (7.0%)	1 (1.8%)	26 (45.6%)	

References

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