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## Letter to the Editor

### Long-term survival outcomes of technically unresectable carcinoma maxilla postinduction chemotherapy

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Dear Editor,

Carcinoma of the maxillary sinus is a rare malignancy.<sup>[1,2]</sup> Due to this, there are limited prospective studies that have been reported. As the early stages of this malignancy remain asymptomatic, most patients get diagnosed in a locally advanced stage.<sup>[1]</sup> Due

to its anatomical proximity to vital structures, surgical resection is a challenge, especially in locally advanced stages. However, surgical resection remains the cornerstone of management of this cancer.<sup>[3]</sup> In a study done by Iyer *et al.* in resectable locally advanced maxillary sinus cancers, surgical resection was associated with a 5-year disease-specific survival of 71% versus 0% in chemoradiation arm ( $P = 0.05$ ).<sup>[4]</sup> However, in very locally advanced borderline resectable maxillary sinus carcinoma, upfront surgery is not possible. We had reported our initial results in 41 patients treated between 2008 and 2011 with induction chemotherapy in these tumors.<sup>[5]</sup> In this letter, we report the long-term results of patients treated with this strategy.

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**Table 1: The impact of different factors on progression-free survival and overall survival**

Variable	Hazard ratio	95% hazard ratio	P
<b>Factors impacting PFS</b>			
Type of local treatment received	0.608	0.112-3.304	0.564
Baseline BMI	1.898	0.709-5.086	0.202
Baseline serum albumin level	3.308	1.365-8.017	0.008
Baseline hemoglobin	0.564	0.227-1.401	0.217
Age	0.608	0.232-1.589	0.310
N stage	0.648	0.247-1.702	0.378
Resectable considered post-NACT in MDJC	1.867	0.527-6.608	0.333
Dose intensity of NACT	0.759	0.244-2.359	0.633
Type of regimen	1.296	0.552-3.044	0.551
Grade	5.145	1.302-20.329	0.019
<b>Factors impacting OS</b>			
Type of local treatment received	1.354	0.252-7.288	0.724
Baseline BMI	1.275	0.517-3.145	0.597
Baseline serum albumin level	3.193	1.270-8.026	0.014
Baseline hemoglobin	0.645	0.286-1.455	0.291
Age	0.497	0.195-1.265	0.142
N stage	0.810	0.323-2.032	0.654
Resectable considered post-NACT in MDJC	0.940	0.257-3.444	0.926
Dose intensity of NACT	0.765	0.274-2.138	0.609
Type of regimen	1.193	0.516-2.755	0.680
Grade	3.981	1.019-15.551	0.047

MDJC=Multidisciplinary joint clinic, PFS=Progression-free survival, OS=Overall survival, NACT=Neoadjuvant chemotherapy, BMI=Body mass index

Forty-one patients with locally advanced technically unresectable maxillary sinus carcinoma were treated with two cycles of induction chemotherapy. All patients had T4 disease. The induction chemotherapy consisted of either three-drug regimen of docetaxel, cisplatin, and 5-fluorouracil or two-drug regimen of taxane (docetaxel or paclitaxel) and platinum (cisplatin or carboplatin). The chemotherapy regimens received were TPF in 7 patients, docetaxel-platinum in 15 patients, and rest received paclitaxel-platinum. The median cycles received were 2. Postinduction regimen, the response rate was 39% (16 patients). These patients were then discussed in a multidisciplinary joint clinic. The further treatment these patients underwent were surgical resection followed by postoperative chemoradiation in 8 patients, radical chemoradiation in 21 patients, radical radiation in 1 patient, palliative radiation in 1 patient, palliative chemotherapy in 4 patients, and best supportive care in 6 patients.

R version 3.4.2 (R Foundation for Statistical Computing, Vienna, Austria) was used for analysis. Kaplan–Meier method was used for the estimation of progression-free survival (PFS) and overall survival (OS). Follow-up was calculated using reverse Kaplan–Meier method. Cox regression analysis was used to identify factors affecting PFS and OS. The median follow-up was 66.3 months. The 5-year progression-free survival rate and OS rate were 15.2% (95% confidence interval [CI] 3.2%–27.2%) and 16.9% (95% CI 4.9%–28.9%),

respectively. The factors which were independently associated with an improvement in PFS and OS were grade of tumor and serum albumin level [Table 1].

The outcomes of T4 carcinoma maxilla reported in the literature are poor.<sup>[1]</sup> Even resected T4 maxillary sinus carcinomas have a 5-year OS between 20% and 36%.<sup>[6-8]</sup> The outcomes of resectable carcinoma maxilla who are treated with chemoradiation are dismal.<sup>[4]</sup> The 5-year disease-specific survival in these patients is 0%. Considering these outcomes, strategy of providing induction chemotherapy followed local treatment based on response seems reasonable. In view of the rarity of this malignancy, it is unlikely that a prospective randomized study would be conducted in this malignancy. Hence, we opine that, in view of the long-term results seen with induction therapy, induction followed by local treatment should be considered as an option in technically unresectable maxillary sinus carcinomas.

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### Conflicts of interest

There are no conflicts of interest.

**Sachin Babanrao Dhupal, Vijay M. Patil, Amit Joshi, Vanita Noronha, Arun Chandrasekharan, Prathamesh Pai<sup>1</sup>, Kumar Prabhash**

Departments of Medical Oncology and <sup>1</sup>Surgical Oncology, Tata Memorial Hospital, Mumbai, Maharashtra, India  
Correspondence to: Dr. Kumar Prabhash,  
E-mail: kumarprabhastmh@gmail.com

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