



## MAXILLOFACIAL ONCOLOGY CARE UNIT: A SAFE AND COST EFFECTIVE MODALITY TO DELIVER QUALITY CARE

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### ARTICLE INFO

#### Article History:

Received 15<sup>th</sup> October, 2016

Received in revised form 7<sup>th</sup>

November, 2016

Accepted 16<sup>th</sup> December, 2016

Published online 28<sup>th</sup> January, 2017

#### Key words:

Head and neck surgery, intensive care unit, progressive patient care, high dependency unit, postoperative care.

### ABSTRACT

**Objectives:** The present article aims to study the need and efficacy of maxillofacial onco high dependency unit after major head and neck surgeries. **Methods:** A retrospective study was done on patients undergoing maxillofacial oncology surgeries from January 2014 to November 2016 at our Department of Oral and Maxillofacial Surgery, Rama Dental College, Hospital and Research Center, Uttar Pradesh, India. **Results:** A total of 182 major operations were done over the period of two and a half years. The patient's age ranged from 16 to 90 years, with a mean of 50.89 years. The male to female ratio was 4:1. Eighty two (45%) had composite major resection with flap reconstruction, twenty six (14.2%) had hemi/total thyroidectomies, sixteen (8.79%) had superficial/total parotidectomies, thirty eight (20.87%) had glossectomies with neck dissections, six (3.29%) had undergone tracheostomies and twelve (6.59%) had isolated RND for unknown 1<sup>o</sup> neck nodes. There were 2 deaths (1.09%). **Conclusion:** we conclude that a specialized head and neck unit is more appropriate than ICU for selected cases, in better management and optimal care of the patient in preventing major post-operative complications and allowing early discharge, thus reducing the overall cost of major surgeries.

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### INTRODUCTION

Surgeries performed for malignancies of the oral cavity and oropharynx region, involve extensive resection and subsequent reconstruction, causing massive alteration in the anatomy of upper aerodigestive tract. Free tissue transfer flaps with microvascular anastomosis are commonly done in such cases and require specialized postoperative monitoring, involving airway observation, flap vitality and intensive wound care. This need is further increased, based on age of the patient, associated systemic disorders and duration of surgery. Thus shifting the patient to intensive care unit during immediate postoperative period is a common practice nowadays<sup>1</sup>. However, this practice has few disadvantages, namely hospital-acquired infections, frequent cancellation of operations due to lack of beds in intensive care unit and increased cost.<sup>2,3</sup> In today's medical healthcare system triage of patients is a must, for effective use of limited resources and all patients do not require complex monitoring in an ICU setup. Chong *et al*<sup>4</sup> reported that more than 90% of their

patients recovered safely in the intermediate care facility. Byrick *et al*<sup>5</sup> documented the reduction of ICU bed occupancy without any adverse effects in patients of aortocoronary bypass or valvular surgeries, by admitting them in intermediate care facility. Knaus *et al* proposed that 49% of admissions to ICU were for close nursing observations only and not intensive treatment.<sup>6</sup>

Understanding the patients requirements after major surgery is the basis of progressive patient care, any incompetency related to this will cause severe detriment of the patient and hamper the success of the surgery. This led to the concept of high dependency unit (HDU). The Association of Anaesthetists of Great Britain and Ireland define HDU as "an area for patients who require more intensive observation, treatment and nursing care than can be provided in a general ward. It would not normally accept patients requiring mechanical ventilation but could manage those receiving invasive monitoring".<sup>7</sup> Crosby *et al*<sup>8</sup> suggested that the nurse : patient ratio should be more in comparison to general ward and only those patients should be

admitted who require more care and observation than available in general ward and not those who need the comprehensive services of ICU. From these literatures, it is inferred that HDU provides better patient care by 1) Maintaining quality of critical care<sup>9</sup>, 2) Allowing ICU occupancy for those who need them<sup>10</sup> 3) Improving the care of patients as compared to general ward 4) Improving postoperative pain management 5) Overall cost reduction.

This study was undertaken to assess the efficacy and cost reduction, which can be achieved with a maxillofacial oncology HDU for patients undergoing neck dissections at our university hospital.

**METHOD**

A retrospective analysis was done of patient's, who had undergone major surgeries for oral or oropharyngeal cancer at Rama Dental College Hospital and Research Center, from January 2014 to November 2016. There were 182 major head and neck operations performed by the first author, which ranged from mandibulectomies, glossectomies, thyroidectomies with flap reconstructions and were divided into 6 groups. The flaps employed for reconstruction were pectoralis major flap, free fibula, radial forearm flap, temporalis flap, deltopectoral flap, and forehead flap (Table 1). The patient's ages ranged from 16 to 90 years, with a mean of 50.89 years. The male to female ratio was 4:1. All the patient's were reviewed for length of stay, amount of monitoring required, airway concerns, method of nutritional alimentation, complications and cost factor.

**Table 1** Major surgeries

No. of Groups	Surgical Procedures	Frequency (n=182)
A	Composite major resection with flap reconstruction	82
B	Hemi/Total Thyroidectomy with Neck Dissection	26
C	Parotidectomy/ Superficial parotidectomy	16
D	Glossectomy + Neck Dissection	38
E	Tracheostomy	6
F	Isolated RND for unknown 1° Neck Nodes	12

**RESULTS**

The data collected of 182 patient's, were divided, based on type of surgeries performed. Eighty two (45%) had composite major resection with flap reconstruction, twenty six (14.2%) had hemi/total thyroidectomies, sixteen (8.79%) had superficial/total parotidectomies, thirty eight (20.87%) had glossectomies with neck dissections, six (3.29%) had undergone tracheostomies and twelve (6.59%) had isolated RND for unknown 1° neck nodes. There were 2 deaths (1.09%) of patient's intra-operatively. Table 2 shows the number of patient admissions in intensive care unit or oncology high dependency unit post-operatively.

**Table 2** Post-operative Admissions

S.no	Groups	Oncology HDU	ICU
1.	A	36 (19.78%)	46 (25.27%)
2.	B	8 (4.39%)	18 (9.89%)
3.	C	8 (4.39%)	8 (4.39%)
4.	D	12 (6.59%)	26 (14.28%)
5.	E	2 (1.09%)	4 (2.19%)
6.	F	4 (2.19%)	8 (4.39%)
	Total	70	110

A total of 70 (38.46%) patient's were admitted in maxillofacial oncology high dependency unit and 110 (60.4%) patient's were admitted in ICU.

**Table 3** Time Duration of ICU Admissions

Patient Groups	Number of Days			
	1 <sup>ST</sup> DAY	2 <sup>ND</sup> DAY	3 <sup>RD</sup> DAY	4 <sup>TH</sup> DAY
A	6	15	13	12
B	2	10	2	4
C	1	4	3	-
D	-	8	6	12
E	-	2	2	-
F	8	-	-	-

The length of stay in ICU ranged from 1 to 4 days, of the 110 patients admitted the details of time duration is shown in Table 3.

Length of stay in Maxillofacial Onco HDU ranged from 1 to 8 days, in 70 patients, as shown in Table 4.

**Table 4** Time Duration of HDU Admissions

Patient Groups	Number of Days							
	1	2	3	4	5	6	7	8
A	-	-	-	-	6	10	8	12
B	-	-	-	-	-	2	2	4
C	-	-	-	-	-	-	3	5
D	-	-	-	-	-	-	3	9
E	-	-	-	2	-	-	-	-
F	-	-	-	1	3	-	-	-

The above tables accounted for a total of 285 days of admissions in ICU and 481 days in Onco HDU unit.

**Charge Analysis**

An analysis was done on amount of expenditure post-operatively based on duration of stay and cost of surgery, operating room charges, anesthetists charges were excluded from this review. On an average Rs 3,000 is the cost of ICU care per day and Onco HDU costs Rs 1,000 per day. Calculations were made comparing the cost, which shows a total expenditure of Rs 8,55,000 for ICU stay and Rs 4,81,000 for Onco HDU care, with total savings of 3,74,000.

**DISCUSSION**

ICU admissions for the first 24-48 hours post-operatively is a standard protocol followed in many head and neck specialty hospitals. Patient's undergoing craniofacial resection requires breathing controlled by mechanical ventilation in ICU to prevent hypercarbia and secondary cerebral oedema. A recent review of practices of head and neck oncologists by Murray and Dempster, showed that 56% of maxillofacial surgeons would regularly transfer patient's to ICU. 57% of ENT surgeons also do the same. The reason for this dependence on ICU, is accentuated as ICU being a convenient option, as it is easy to access and lack of availability of high dependency units and trained nursing staffs. Therefore question arises, should we develop more HDU's, in our opinion the answer is "Yes", in our study done over a span of two and a half years, a total of 182 major surgeries were done in maxillofacial region, out of which 70 (38.46%) patient's were admitted in our maxillofacial oncology HDU. The patient's were effectively monitored for airway patency, flap vitality and intensive wound care. Trained nursing care was done by hourly monitoring of the urinary output, respiratory rate, pulse, blood pressure and SaO<sub>2</sub>. Post-operative haemodynamic was

routinely observed to avoid fluid overload, which may lead to tissue oedema, congestion of flaps. Body temperature was recorded regularly and warming devices e.g intravenous fluid warmers or mattresses were used in cases of hypothermia.

Apart from the clinical need for HDU, cost effectiveness provided by these units is also an important point to consider, in our study, a comparison of expenditure observed in both ICU and Onco HDU, showed a difference of Rs 3,74,000. The nurse to patient ratio is less as compared to ICU, thus the charges beared by the patient's are less. Also as trained nursing staffs are exposed to specialist maxillofacial oncology care, which in turn helps in maintaining esprit de corps among staffs and surgeons and ICU beds are available, for the needy. Surgeries are not dependent on availability of ICU beds, thus reducing the stress on patient's and their families.

Conclusion- Our study has shown that regular admissions in ICU can be avoided in maxillofacial oncology surgeries. Close monitoring of patient's in Maxillofacial Onco HDU's, by trained staffs is a safe and reliable method to provide better post-operative care, which improves overall patient management and is also cost effective in nature.

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