Original Article

Intraoperative Blood Loss in Head and Neck Cancer Operations: A Retrospective Observational Study in a Tertiary Care Surgical Oncology Center in Central India

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ABSTRACT

Introduction: Head and Neck cancer surgical operations are often associated with major blood loss requiring substitution, usually by homologous blood transfusion. The goal of this study is to retrospectively examine the intraoperative blood loss for the various types of Head and Neck surgical procedures in a tertiary care center in Central India.

Methodology: Head and neck cancer cases were analysed in this retrospective observational study at Department of Surgical oncology at Sri Aurobindo Institute of Medical Science, Indore.100 biopsy proven oral cancer patients who underwent curative surgery were included in the study. Intraoperative blood loss was assessed depending on site of disease, type of procedure and T-stage of disease and its implication on post-operative hospital stay was noted.

Result: A total of 100 oral cancer patients were analysed out of which majority of patients (36) were Ca buccal mucosa (36%). Blood loss intraoperatively was calculated by using visual assessment method. Average Intraoperative Blood loss was more in Ca buccal mucosa cases (536.11 ml). Average blood loss was more in infrastructural maxillectomyand also when superior alveolectomy was combined with hemimandiblectomy or segmental mandibulectomy, also blood loss was more for T4a disease compared to T1-T3. 30 out of 43 patients with blood loss >400mlhad prolonged hospital stay of more than 7 days with an average of 12 days post-operative hospital stay. This difference in hospital stay was statistically significant.

Conclusion: It is of paramount importance to achieve adequate and meticulous intra-operative haemostasis in oral cancer surgeries in order to decrease the post-operative stay of the patient which will also decrease the economical burden of the patient and family.

Key words: oral cancer, blood loss, hospital stay, head and neck cancer

INTRODUCTION

Head-and-neck cancers (HNCs) are the sixth most common malignancy worldwide. Approximately, half of the reported head and neck malignancies are oral cavity squamous cell carcinomas (SCCs), with an estimated 300,000 new cases every year globally.[1] Oral cancer (OC) is a common cancer in the Southeast Asia region. According to the National Cancer Registry Programme of India, among males, Ahmedabad Urban Cancer Registry and East Khasi Hills Cancer Registry in females have recorded the highest age-adjusted incidence rates of OC.[2] This higher prevalence of OC may be attributed to the high consumption of areca nut and tobacco in any form in these regions.

Head and Neck cancer surgical operations are often associated with major blood loss requiring substitution, usually by homologous blood transfusion. The goal of this study is to retrospectively examine the intraoperative blood loss for the various types of Head and Neck surgical procedures in a tertiary care center in Central India.

METHODS

Head and neck cancer cases were analysed in this retrospective observational study at Department of Surgical oncology at Sri Aurobindo Institute of Medical Science, Indore. 100 biopsy proven oral cancer patients who underwent curative surgery were included in the study. Intraoperative blood loss was assessed depending on site of disease, type of procedure and T-stage of disease and its implication on post-operative hospital stay was noted.

Statistical analysis: Data were analysed by using INSTAT software (Graphpad prism software, Inc,. La

Zolla, CA. USA). Demographic data were studied using unpaired Student's t-test. The student t-test of significance/chi square test was used wherever deemed necessary. The p-value ≤0.05 was taken as significant.

RESULTS

A total of 100 oral cancer patients were analysed out of which majority of patients (36) were Ca buccal mucosa(36%), followed by 26 patients of tongue primary(26%), 26 patients of ca alveolus(26%) majority were lower alveolus(24) and 2 patients of upper alveolus, 6 patients were having Ca Lip and 6 patients of Ca Retromolar trigone(RMT). ln the 100 patients, there were 23 women (23%) and 77 men (77%). The average age was 43 +/- 9 years. Biopsy of all 100 cases were squamous cell carcinoma.

Blood loss intraoperatively was calculated by using visual assessment method[3] (Figure 1) which is the most commonly used method however not much accurate.

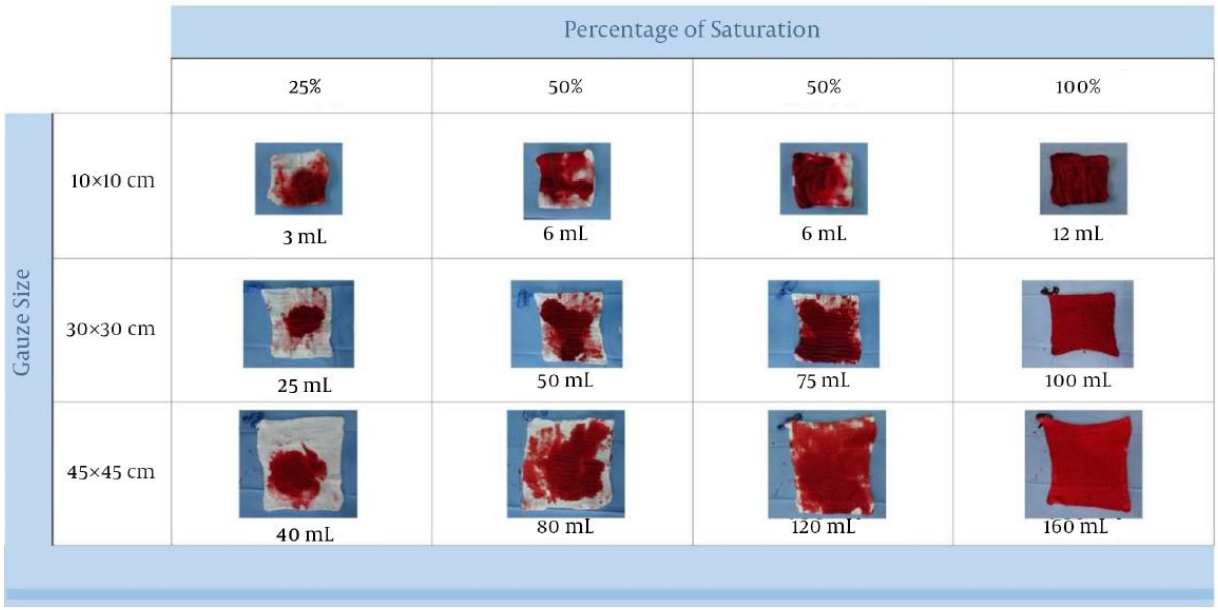

Figure 1: Visual Guide for Determining Blood Loss for Three Different Sizes of Gauze.

Average Intraoperative Blood loss in Ca buccal mucosa cases were 536.11 ml, followed by Ca alveolus 426.92 ml, Ca RMT 383.33 ml, Ca tongue cases 351.92, Ca lip 275ml (table 1).

Blood loss in terms of Hemimandibulectomy (HM), Segmental Mandibulectomy (SM), superior alveolectomy(SA), Infrastructural maxillectomy were compared.

Average Blood loss when HM or SM done were compared and analysed by student t-test with average blood loss when SA was combined with SM/HM and p-value is 0.475 which is statistically not significant. Also, average blood loss with HM only was compared with SM only, p-value is 0.48 (statistically insignificant) (table 2).

Average Blood loss in surgeries of T1-T3 disease were compared to those in T4a disease. Even though blood loss was more in surgeries for T4a disease, the p value was 0.49 ie, the difference was not statistically significant (table 3).

Table 1: Blood Loss in terms of Site of disease

Site of disease	Cases(n)	Average blood loss
Buccal mucosa	36	536.11
Alveolus	26	426.92
Retromolar Trigone	6	383.33
Tongue	26	351.92
Lip	6	275

Table 2: Blood loss in terms of Type of Procedure performed:

Type of Procedure	No of cases	Total Blood Loss(ml)	Avg Blood Loss(ml)
Hemimandibulectomy(HM) only	17	8700	511.76
Segmental Mandibulectomy (SM) only	13	5800	446.15
SM/HM + Superior Alveolectomy(SA)	14	9500	678.571
Infrastructural Maxillectomy	2	1800	950

Table 3: Blood Loss in terms of T-staging of the disease:

Stage of the disease	Cases(n)	Avg blood loss
T1- T3	57	357.89
T4a	43	529.06

P value = 0.49

Table 4: Duration of Hospital Stay

Blood Loss	Post-operative Hospital Stay	
	<7 days	>7 days
< 400 ml (n = 57)	40	17
>400ml (n= 43)	13	30
Total (n=100)	53	47

P value = 0.001

Duration of Hospital Stay:

Intraoperative blood loss was divided in 2 groups of Group A(<400ml) and Group B(>400ml). it was seen that out of 57 patients in group A 40 (70%) had less than 7 days hospital stay post-surgery. In Group B however majority of patients 30(69.7%) out of 43 patients with blood loss >400ml had prolonged hospital stay of more than 7 days with an average of 12 days post-operative hospital stay. This difference in hospital stay was statistically significant (table 4).

DISCUSSION

Oral cancer is one of the 10 most common cancers as stated by the World Health Organization localized predominantly to the tongue however may also occur on the floor of the mouth, gingiva, lip, and palate.[4] In India, oral cancer is a major health problem, accounting for 30%–40% of all cancers diagnosed.[5]

In India, oral cancer is a major health problem, in high-risk countries such as Sri Lanka, India, Pakistan, and Bangladesh, oral cancer is the most common cancer in men, and may contribute up to 25% of all new cases of cancer.[5] Oral cancer is the most common cancer in men in high-risk countries.[6] ln this study of 100 oral cancer patients, there was male predominance with 77 male patients (77%) . The average age was 43 +/- 9 years. The recorded age of the patients in the study ranged from 26 to 72 years.

One of the major contributory factors for the development of cancer is tobacco chewing.[7] The other risk factors that contribute in the pathogenesis of oral cancers are consumption of alcohol in very high amounts, infections specially HPV, sharp tooth, sexually transmitted diseases, chronic inflammatory conditions of the tongue. In our study we found that smokeless tobacco use is major etiology for the oral cancer.

Average intraoperative Blood loss was more when superior alveolectomy (a variant of partial maxillectomy) was done in addition to hemimandibulectomy/segmental mandibulectomy in order to achieve adequate surgical margins in tumours involving upper GBS as well. More blood loss was probably due to extensive resection in these patients, however there was no statistically significant difference was found between different mandibulectomies/ maxillectomies in terms of intraoperative blood loss. Similarly, in our study, the average intraoperative blood loss dint not differ significantly in terms of different subsites of oral cancers.

In our study we had also analysed intraoperative blood loss in surgeries performed for T4 vs less than T4 disease. Majority of oral cancers in our hospital were T1-T3 (n= 57) compared to T4 (n=43). Average intraoperative Blood loss in surgeries performed for T4 disease was 529.06 ml compared to 357.89 ml in T1-T3 disease. The increased blood loss in T4 disease surgeries is attributed to extensive dissection with mandibulectomies and skin margin excisions (in those patients with skin involvement and orocutaneous fistula) compared to T1-T3 disease surgeries where in most cases wide local excision of tongue or buccal mucosa with primary closure sufficed without bone resections. However, this difference in blood loss was not found to be statistically significant.

Also, in our study we compared intraoperative blood loss and post-operative hospital stay for the patients, and it was observed that in those patients with increased intraoperative blood loss (> 400 ml) had more days (>7day) of hospital stay post-operative (including icu and ward stay) with an average stay of 12 days. And this difference in hospital stay as a result of increased intraoperative blood loss was statistically significant.

In the case of the mandible, the bleeding occurs from the alveolar arteries and the facial artery or branches of these. Controlling intraoperative bleeding to prevent excessive blood loss requires a good view of the surgical field, a good knowledge of anatomy, and the exercise of care during the intervention.15 Bleeding can be minimized by respecting the margins for the various vessels in the surgical field. The surgeon's skill is particularly important in terms of compressing the area with gauze and/or cauterizing or ligating the vessels responsible for bleeding. Another method to reduce operative bleeding is to induce controlled hypotension during surgery.[8-10] Praveen et al[9] compared normotensive and hypotensive anesthesia and reported significant differences between the 2 groups. In the hypotensive group, the average blood loss was 200 mL (maximum 400) compared with 350 mL (maximum 1,575 mL) in the normotensive group.

We occasionally use infiltration of adrenaline 1 : 200,000 for up to 15 min prior to the wound incision and always use hypotensive anaesthesia for neck dissection and resection of primary and these contribute to reduction in blood loss.

CONCLUSION

Thus, it is of paramount importance to achieve adequate and meticulous intra-operative haemostasis in oral cancer surgeries in order to decrease the post-operative stay of the patient which will also decrease the economic burden of the patient and family.

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