ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

https://indiancancerawarej.com

Indian Cancer Awareness Journal

Review Article

Oral Maxillofacial Surgeon – A Hidden Weapon in Head and Neck Oncology

Anshuman Kumar[1], Debasmita Sarkar[1]

[1]Department of Surgical Oncology, Dharamshila Narayana Superspeciality Hospital, Vasundhara Enclave, New Delhi, India.

***Corresponding author:**
Dr. Debasmita Sarkar
Fellow in Head and Neck Oncology, Department of Surgical Oncology, Dharamshila Narayana Superspeciality Hospital, Vasundhara Enclave, New Delhi, India.

debas.09@gmail.com

Received: 28 January 2023
Accepted: 27 May 2023
EPub Ahead of Print: 14 June 2023
Published: 28 December 2023

DOI
10.25259/ICAJ_3_2023

Quick Response Code:

ABSTRACT

Oral squamous cell carcinoma dominates all the oral cancer cases with potentially malignant disorders which are also recognised as detectable pre-clinical phase of oral cancer. Patients with head and neck cancer should get a thorough dental oncologic examination as part of their pre-treatment evaluation. Dental professionals that specialise in oral and maxillofacial (OMF) surgery are the best people to manage patients with tumours in this area. This study discusses the significance of having these oncology-trained surgeons on the head and neck surgical teams, their underappreciated contributions to raising awareness of oral cancer and its negative effects among the general public as well as teaching oral cancer patients proper oral hygiene techniques. It also discusses the difficulties they face today to practise oncosurgery and be respected by their medical colleagues and provides an answer to the question of whether OMF surgeons have any role in such surgical setups.

Keywords: Oral squamous cell carcinoma, Oral hygiene, Maxillofacial surgeon, Oncology

INTRODUCTION

Oral cancer (i.e., cancer of the lips, buccal mucosa, floor of the mouth, tongue, hard palate, gingiva and alveolar mucosa) ranks sixth globally among all types of cancer with India withholding the largest number of oral cancer cases.[1] In India, around 77,000 new cases and 52,000 deaths are reported annually, which are roughly one-fourth of global incidences.[2] Oral squamous cell cancer contributes to 84–97% of oral cancer. The continued use of tobacco in the form of gutka, khaini, mawa, zarda, bidi with alcohol, betel quid chewing, smokeless tobacco and viral infections are some of the major risk factors associated with oral malignancy. Potentially malignant disorders such as leukoplakia, erythroplakia and oral submucous fibrosis represent the pre-clinical phase of oral cancer.[3] Chemopreventive agents such as vitamin A, retinoids, beta carotene, vitamin E, and vitamin C with cyclooxygenase inhibitors and epidermal growth factor receptor inhibitors have shown promise in reversing the pre-malignancies but not reducing the risk of invasive oral carcinoma or preventing second primary head and neck cancers.[4-6] Outcomes for patients with oral cancer are dependent on early detection and stage of disease at diagnosis. Despite the advances in diagnosis and treatment during the past 40 years, the overall 5 year survival for oral squamous cell carcinoma has only slightly improved.[7] Early stage disease with early detection is associated with a higher survival rate, less morbidity and better quality of life.

DENTAL AND MAXILLOFACIAL ONCOLOGY

Cancer care is not limited to primary oncologic surgery. Awareness about the risk factors for cancer, prevention through risk factor modification and appropriate screening also play major roles in minimising the impact of such cancers. An oncologic dentist plays an important role in educating people about oral cancer and its untoward effects, training the cancer patient in oral hygiene methods, and providing prosthesis to correct surgical defects during and after the treatments. Dental practitioners are the ones who might identify early stage malignancies much before primary care physicians while examining the oral complex or during root canal or caries treatment, periodontal check-ups, extraction of teeth or prosthodontic reconstructions. Hence, an absence of a dental consultation can be a serious problem that could reduce the patient's quality of life.

Oral and maxillofacial (OMF) surgeons are specialists with roots both in dentistry and medicine. They play an important part in treatment of head and neck cancer and must be recruited into an oncology team. Since the 19th century, they have contributed to advanced detection, treatment and reconstruction. The tubed flap, popularised by Sir Gillies, was first described in 1917 by a German oral surgeon, Ganzer.[8,9] Similarly, Obwegeser described the temporal approach for the resection of tumours in the lateral part of medial cranial base.[10,11] In Asia and Japan, OMF surgery (OMFS) is the dominant oncologic surgical specialty for treatment of oral cancer. There may be a disconnect between the diagnosis and surgical management of oral cancer patients as oral surgeons are not included currently as primary oncologic surgeons in tertiary care multidisciplinary head and neck cancer teams.[12] Furthermore, asymptomatic patients generally do not visit dental specialists whereas non-specialist physicians delay the diagnosis of oral cancers more frequently than dentists.[7] OMF surgeons can provide many phases of oral cancer care on a routine basis and improve outcomes. To provide state of the art care for an oral cancer patient, a maxillofacial oncologist must play an integral role in all aspects of treatment, whether surgical or non-surgical as current research indicates their role as inadequate.

SCREENING AND DETECTION

Screening is defined as the search for disease in a person who does not have symptoms or someone who does not recognise the symptoms as being related to the disease.[13] According to the American Cancer Society, asymptomatic patients for cancers of the head and neck, including oral cancers, should be screened every 3 years between the ages of 20 and 40 years and yearly after the age of 40.[14] Screening a high risk, asymptomatic population has been shown to result in earlier detection of oral cancers.[15] In case of oral cancers, a dentist plays a pivotal role in the early examination of their occurrence and then refers these cases to an OMFS for conducting further examinations. A study conducted in 2003 revealed that detection during the non-symptom driven examinations took place mostly in dental offices, a denturist's office and in OMF surgeon's office compared to symptom driven examinations. The asymptomatic patients that were referred from a dental office had smaller lesions and lower stage clinically and pathologically with no cervical metastases.[7] Kowalski *et al*.[16] had suggested that symptomatic patients were more likely to visit physicians. Studies have also shown that patients who are at risk for oropharyngeal cancers are 4–6 times more likely to visit physician services than dental services.[17,18] Although no randomised trial has shown that screening results in improvement in mortality, there is evidence proving that identification of smaller lesions leads to less aggressive treatments with better quality of life.[13] In India, self-examination is considered one of the most effective methods for early detection of oral malignancy. Various screening and detection techniques such as toluidine blue, Lugol's iodine, VELscope, brush biopsy, spectroscopy, polymerase chain reaction and liquid biopsy have been advocated for improving the reliability of clinical examinations.[19-22] It has been proposed that poor oral hygiene is a contributor to oral cancer. The association of several oral hygiene indicators with incident head and neck cancers has been investigated and it was inferred that good oral hygiene characterised by few missing teeth, annual dental visits and daily tooth brushing reduces the risk of oral cancer.[23]

IMPACT OF CANCER TREATMENT ON THE ORAL HEALTH

The treatments that are involved in eradicating head and neck cancer are (i) surgery, (ii) radiation with or without chemotherapy and (iii) combined treatment. Oral complications such as mutilation of tissues and physiologic changes are produced by surgery, radiation therapy causes short term changes such as mucositis, dysgeusia, change in salivary composition and infection and chronic complications such as trismus, xerostomia, dysphagia, malnutrition, osteoradionecrosis and dental caries, whereas neoadjuvant/adjuvant chemotherapy cause mucositis and taste changes along with immune suppression.[4,24] The newer targeted therapies such as epidermal growth factor and tyrosine kinase inhibitors also cause erythematous mucosal reactions, lichenoid reactions and aphthous like lesions.[25,26] These effects are not reversible but can be minimised with the help of proper and long-term continuous oral care which is provided by oncology-trained maxillofacial surgeons or other dental providers.

PRE-TREATMENT DENTAL CONSIDERATIONS

Patients need to be counselled regarding the implications of surgery and radiation to the head and neck region and carefully explained the importance of regular, life-long oral care. Extensive clinical and radiographical dental examinations should be done through orthopantomograph, intraoral radiographs and periodontal probing.[27] Regarding the removal of teeth prior to radiation therapy, no clear cut evidence exists to guide the decision.[28,29] Criteria that have been proposed for extraction of teeth in high dose radiation field include advanced periodontal disease, non-restorable teeth, carious teeth, teeth with root resorption, teeth requiring significant restorations, teeth with peri-apical pathology and partially impacted teeth with pericoronitis. The time required for adequate healing should be approximately 2–3 weeks.[30] Fluoride varnishes containing 5% sodium fluoride have been recommended for preventing decay in the xerostomic patient.[31] Historically, pilocarpine was administered as a salivary stimulant for xerostomia but in a recent study when offered before and after radiation, it did not offer any benefit.[32] Amifostine is used as a radioprotectant and reduces the severity of mucositis and maintains salivary function in patients.[33-35] To prevent the adjacent normal oral tissues from the radiation exposure or to assist in tissue positioning, a maxillofacial prosthodontist could be contacted for preparation of custom oral devices such as positioning/opening devices, midline blocks, or anti-scatter trays. Chemotherapy given neoadjuvant for head and neck malignancies for decreasing the possible distant metastases or concurrently with radiation for advanced stages leads to myelosuppression approximately 1 week after infusion.[36] Hence, the patients should be encouraged and made aware of the oral hygiene measures to control any chance of infection. If a defect of hard and soft palate is anticipated whose resection would not allow reconstruction by a local or regional flap, then a prosthodontist should be consulted regarding immediate surgical obturators. A good communication must be maintained between the maxillofacial oncologist and prosthodontist to have a favourable reconstructive outcome.

ORAL CARE DURING CANCER TREATMENT

In cases where resections include a mandibulectomy and intermaxillary fixation are important for maintaining the occlusion and intercuspation, the expertise of a maxillofacial oncologist is required. This procedure allows the remaining mandible to function and glide within the confines of the temporomandibular joint. It also provides a template for placement of the grafted bone. Osseointegrated implants if required may be placed by an OMFS either during the primary procedure or at a second-stage surgery once the graft viability has been confirmed.[37,38] For proper speech and for eating immediately after a hard palate resection case, an immediate surgical obturator can be provided. This obturator can be later modified according to the defect size and the patient's needs. Oral pain mostly due to mucositis is one of the major symptoms in radiotherapy patients. MASCC/ISOO recommends topical analgesics/anaesthetic agents or parenteral morphine sulphate for temporary oral comfort. Patients should be advised by the dental oncologists to rinse the oral cavity with saline or sodium bicarbonate solution or hydrogen peroxide. Rinsing with 0.12% chlorhexidine solutions can prevent fungal growth in the mouth. A lot many patients tend to discontinue the oral hygiene practices due to discomfort but the physicians must encourage them to continue maintaining the oral health or refer them to dental oncologists who would guide them in doing so. Patient education is an integral part of the dental treatment to support nutrition, reduce alcohol and tobacco and receive optimal oral care. Oral symptoms need attention from both the head and neck surgeons and dental oncologists to have a completion of cancer treatment.

POST-TREATMENT FOLLOW-UP

To maintain a long term, flawless oral health is challenging but the most satisfying aspect of the dental management in the treated head and neck cancer patients. They need to be closely monitored for any kind of complications, recurrence or second primaries. Their oral care regimen should be performed weekly in the immediate post-operative phase and should be assessed by maxillofacial surgeons. It is their duty to instruct the patients to maintain an optimum level of oral hygiene by guiding them in atraumatic tooth brushing, flossing, and using non-medicated bland oral mouth rinses without alcohol. Ultrasonic or electric brushes may be recommended and fluoride toothpastes/gel or rinses must be advised for the entire duration of the patient's life. Post-radiation patients or patients with large resections of the maxilla which include the tuberosity, the hamular notch and pterygoid fossa area experience trismus which is one of the most troublesome complications. A maxillofacial oncologist can guide such patients in daily mouth opening exercises with ice-cream sticks, and tongue blades that serve as a lever and monitor the range opening.[39] Trismus therapy devices such as Heister appliance, Therabite appliance and acrylic plates with Hyrax screws may also be incorporated and taught how to be used. Post-resection and reconstruction of the jaws and implants might be placed by the maxillofacial surgeons for prosthetic rehabilitation or might be incorporated during harvesting of regional or free flaps in a single sitting. If prosthetic rehabilitation is desired, then it should be done after 3–6 months of complete healing of the surgical defect, although radiation therapy might delay it.[36] Head and neck cancer survivors must be encouraged to visit dental camps more often and to attend oral health awareness camps for

prevention of recurrence, maintenance of oral health and avoiding risk factors associated with head and neck cancers.

CHALLENGES OF AN OMF SURGEON

Maxillofacial surgical oncologist is someone who performs surgery for cancers of the maxillofacial region whereas a maxillofacial oncologist is a doctor who diagnoses maxillofacial malignancies of all types and may provide prescription for a chemotherapy regimen or any needed radiation treatments. Whether oral surgeons are permitted to undertake mouth cancer resections and reconstructions is a long-standing debate among medical graduates that occasionally prevail. Similar to medical school, the dentistry program offers experience in the pathophysiology of common human diseases, but it then narrows its focus to the status and treatment of illnesses and deformities that exclusively affect the head and neck. An OMS residency helps dentistry graduates hone their skills and gives them instruction in managing surgery patients' medical and anaesthetic needs. There are a number of clinical, educational and scientific challenges that need to be resolved, despite the fact that numerous official fellowship programs have been formed in India to train OMF surgeons about cancer therapy and reconstruction. Ensuring a proper pre-treatment oral care reduces complications during and after cancer therapy. Following therapy, oral hygiene is directly impacted by a patient's subjective dread of pain. Patients frequently neglect to maintain good oral hygiene because they do not place a high importance on the oral implications. As a result, many patients frequently experience problems after surgery and radiotherapy. It is important to consider oral care as part of overall patient care. Hence, an OMF practitioner trained in oncology must be granted the authority to become a permanent member of the team and to counsel patients on oral care treatments and implications. Unlike other surgical subspecialties that struggle with diminishing number of surgeons interested in management of head and neck oncologic disease, OMFS trainees are much more eager to advance their training in head and neck oncology. OMF surgeons who have completed their fellowships in head and neck oncology are yet not given the respect and recognition in India in most of the hospitals due to the existing disparity between medical and dental fields. Our growing position as major providers of care for those patients with cancer in the OMF region must be disseminated. The OMF surgeons with certified qualification in oncology and reconstruction must be recruited in the head and neck oncosurgery unit not only for management of patients with OMF tumours but also for spreading awareness regarding the importance of oral health, for earlier detection of oral cancer and post treatment rehabilitation. However, sometimes treating the symptoms and signs of the immediate post-operative cancer patients along with their other systemic problems becomes difficult for some maxillofacial cancer surgeons because, unlike their medical colleagues, they are not specifically trained to treat systemic conditions in their postgraduation. They must therefore go an extra mile to complete fellowships in Head and Neck oncology at Specialised Cancer Centres to understand how to handle all the systemic complications that the medical students would have otherwise addressed. Nevertheless, they should work synergistically with the medical fraternity in a hospital setup to have an appropriate outcome. The present scenario in India is dark from this point of view but the future may be bright provided the maxillofacial fraternity organises quality conferences and symposiums inviting doctors and government officials to increase their visibility as a hidden and important weapon in oral cancer care.

CONCLUSION

India is considered as the world capital for oral cancer cases as it shares one-third of the global burden. Prevention, early diagnosis and timely treatment are critical aspects to tackle oral cancer-related burden. The unique background of OMFS (medicine and dentistry) with significant experience in maxillofacial oncology and reconstructive surgery would help improve the education of future dentists and physicians about their role in management of oral, lip and oropharyngeal cancers. OMF oncosurgeons are the one of the tributaries of head and neck oncology branch who are important to the fraternity but often neglected, and hence, awareness needs to be spread regarding their importance in detection, management, rehabilitation and maintenance of oral health of oral cancer patients, thus increasing their quality of life.

Acknowledgements

I would like to sincerely thank my mentor Dr. Anshuman Kumar who provided me with the concept behind the review article and helped me critically analyse the topic. He also paved my perspective regarding the same.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Gupta B, Bray F, Kumar N, Johnson NW. Associations between oral hygiene habits, diet, tobacco and alcohol and risk of oral cancer: A case-control study from India. Cancer Epidemiol 2017;51:7-14.
2. Laprise C, Shahul HP, Madathil SA, Thekkepurakkal AS, Castonguay G, Varghese I, *et al*. Periodontal diseases and risk of oral cancer in Southern India: Results from the HeNCe Life study. Int J Cancer 2016;139:1512-9.
3. Ajay P, Ashwinirani S, Nayak A, Suragimath G, Kamala K, Sande A, *et al*. Oral cancer prevalence in Western population of Maharashtra, India, for a period of 5 years. J Oral Res Rev 2018;10:11-4.
4. Shah J, Patel S, Singh B, Wong R. Jatin Shah's Head and Neck Surgery and Oncology. 5th ed. Philadelphia, PA: Elsevier/ Mosby; 2020.
5. Bairati I, Meyer F, Gélinas M, Fortin A, Nabid A, Brochet F, *et al*. Randomized trial of antioxidant vitamins to prevent acute adverse effects of radiation therapy in head and neck cancer patients. J Clin Oncol 2005;23:5805-13.
6. Day GL, Shore RE, Blot WJ, McLaughlin JK, Austin DF, Greenberg RS, *et al*. Dietary factors and second primary cancers: A follow-up of oral and pharyngeal cancer patients. Nutr Cancer 1994;21:223-32.
7. Holmes JD, Dierks EJ, Homer LD, Potter BE. Is detection of oral and oropharyngeal squamous cancer by a dental health care provider associated with a lower stage at diagnosis? J Oral Maxillofac Surg 2003;61:285-91.
8. Ganzer H. The formation of long-stalked strand flaps in facial plastic surgery. Berl Klin Schr 1917;54:1095.
9. Gillies H. Plastic Surgery of the Face: Based on Selected Cases of War Injuries of the Face Including Burns. London, Frowde: Hodder and Stoughton; 1920.
10. Hadjianghelou O, Obwegeser HL. Temporal bone approach to the retromaxillary-infracranial space and the orbit in tumor surgery. Laryngol Rhinol Otol (Stuttg) 1986;65:46-56.
11. Obwegeser HL. Temporal approach to the TMJ, the orbit, and the retromaxillary-infracranial region. Head Neck Surg 1985;7:185-99.
12. Cuddy KK, Cobb G. The participation of Ontario oral and maxillofacial surgeons in oral, lip and oropharyngeal cancer. J Can Dent Assoc 2015;81:f6.
13. Smart CR. Screening for cancer of the aerodigestive tract. Cancer 1993;72:1061-5.
14. Mettlin C, Todd GD. The American Cancer Society guidelines for the cancer-related check-up: An update. CA Cancer J Clin 1991;41:279-82.
15. Mashberg A, Meyers H. Anatomical site and size of 222 early symptomatic oral squamous cell carcinomas: A continuing prospective study of oral cancer. II. Cancer 1976;37:2149-57.
16. Kowalski LP, Franco EL, Torloni H. Lateness of diagnosis of oral and oropharyngeal carcinoma: Factors related to the tumour, the patient and health professionals. Eur J Cancer B Oral Oncol 1994;30B:167-73.
17. Centers for Disease Control (CDC). Deaths from oral cavity and pharyngeal cancer-United States, 1987. MMWR Morb Mortal Wkly Rep 1990;39:457-60.
18. Choido GT, Eigner T, Rosenstein DI. Oral cancer detection: The importance of routine screening for prolongation of survival. Postgrad Med 1986;80:231-6.
19. Borse V, Konwar AN, Buragohain P. Oral cancer diagnosis and perspectives in India. Sens Int 2020;1:100046.
20. Babshet M, Pervatikar S, Nandimath K, Naikmasur V. Efficacy of oral brush cytology in the evaluation of the oral premalignant and malignant lesions. J Cytol 2011;28:165-72.
21. Lousada-Fernandez F, Rapado-Gonzalez O, Lopez-Cedrun JL, Lopez-Lopez R, Muinelo-Romay L, Suarez-Cunqueiro M. Liquid biopsy in oral cancer. Int J Mol Sci 20118;19:1704.
22. Sawan D, Mashlah A. Evaluation of premalignant and malignant lesions by fluorescent light (VELscope). J Int Soc Prev Community Dent 2015;5:248-54.
23. Hashim D, Sartori S, Brennan P, Curado MP, Wünsch-Filho V, Divaris K, *et al*. The role of oral hygiene in head and neck cancer: Results from International Head and Neck Cancer Epidemiology (INHANCE) consortium. Ann Oncol 2016;27:1619-25.
24. Perterson DE, Jensen SB. Oral complications of nonsurgical cancer therapies: Diagnosis and treatment. In: Glick M, editor. Burket's Oral Medicine. 12th ed. Shelton: PMPH-USA, Ltd.; 2014. p. 201-18.
25. Thariat J, Vignot S, Lapierre A, Falk AT, Guigay J, Van Obberghen-Schilling E, *et al*. Integrating genomics in head and neck cancer treatment: Promises and pitfalls. Crit Rev Oncol Hematol 2015;95:397-406.
26. Jackson LK, Johnson DB, Sosman JA, Murphy BA, Epstein JB. Oral health in oncology: Impact of immunotherapy. Support Care Cancer 2015;23:1-3.
27. Khan Z, Farman AG. The prosthodontist's role in head and neck cancer and Introduction - Oncologic dentistry. J Indian Prosthodont Soc 2006;6:4-9.
28. Bruins HH, Koole R, Jolly DE. Pre-therapy dental decisions in patients with head and neck cancer. A proposed model for dental decision support. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;86:256-67.
29. Meraw SJ, Reeve CM. Dental considerations and treatment of the oncology patient receiving radiation therapy. J Am Dent Assoc 1998;129:201-4.
30. Jansma J, Vissink A, Spijkervet F, Roodenburg JL, Panders AK, Vermey A, *et al*. Protocol for prevention and treatment of oral sequelae resulting from head and neck radiation therapy. Cancer 1992;70:2171-80.
31. Beltran-Aguilar E, Goldstein J, Lockwood S. Fluoride varnishes. A review of their clinical use, cariostatic mechanism, efficacy and safety. J Am Dent Assoc 2000;131:589-94.
32. Warde P, O'Sullivan B, Aslanidis J, Kroll B, Lockwood G, Waldron J, *et al*. A phase III placebo-controlled trial of oral pilocarpine in patients undergoing radiotherapy for head and neck cancer. Int J Radiat Oncol Biol Phys 2002;54:9-13.
33. Hensley M, Schuchter L, Lindley C, Meropol NJ, Cohen GI, Broder G, *et al*. American Society of Clinical Oncology clinical practice guidelines for the use of chemotherapy and radiotherapy protectants. J Clin Oncol 1999;17:3333-55.
34. Buntzel J, Kuttner K, Frohlich D, Glatzel M. Selective cytoprotection with amifostine in concurrent radiochemotherapy for head and neck cancer. Ann Oncol

1998;9:505-9.
35. Wagner W, Prott F, Schonekas K. Amifostine: A radioprotector in locally advanced head and neck tumors. Oncol Rep 1998;5:1255-7.
36. Maureen S. The expanding role of dental oncology in head and neck surgery. Surg Oncol Clin N Am 2004;13:37-46.
37. Marunick M, Roumanas E. Functional criteria for mandibular implant placement postresection and reconstruction for cancer. J Prosthet Dent 1999;82:107-13.
38. Scharloff A, Haughey B, Gay W, Paniello R. Immediate mandibular reconstruction and placement of dental implants at ablative surgery. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1994;78:711-7.
39. Taylor TD. Clinical Maxillofacial Prosthetics. Chicago: Quintessence; 2000.

How to cite this article: Kumar A, Sarkar D. Oral maxillofacial surgeon – A hidden weapon in head and neck oncology. Indian Cancer Awareness J. 2023;2:40-5. doi: 10.25259/ICAJ_3_2023