

# CONSENSUS DOCUMENT FOR MANAGEMENT OF BUCCAL MUCOSA CANCER

Prepared as an outcome of ICMR Subcommittee  
on Buccal Mucosa Cancer



Indian Council of Medical Research

(Department of Health Research)

Ansari Nagar, New Delhi – 110029

2014

### **Disclaimer**

This consensus document represents the current thinking of experts on the topic based on available evidence. This has been developed by national experts in the field and does not in any way bind a clinician to follow this guideline. One can use an alternate mode of therapy based on discussions with the patient and institution, national or international guidelines. The mention of pharmaceutical drugs for therapy does not constitute endorsement or recommendation for use but will act only as a guidance for clinicians in complex decision –making.

Dr. V.M. Katoch  
Secretary,  
Department of Health Research  
and Director General, ICMR

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# Foreword

I am glad to write this foreword for Consensus Document for Management of Buccal Mucosa Cancer. The ICMR had constituted sub-committee to prepare this document for management of various cancer sites. This document is the result of the hard work of various experts across the country working in the area of oncology.



This consensus document on management of Buccal Mucosa cancers summarizes the modalities of treatment including the site-specific anti-cancer therapies, supportive and palliative care and molecular markers and research questions. It also interweaves clinical, biochemical and epidemiological studies.

The various subcommittees constituted under Task Force project on Review of Cancer Management Guidelines worked tirelessly in drafting cancer site-specific guidelines. Each member of the subcommittee's contribution towards drafting of these guidelines deserves appreciation and acknowledgement for their dedicated research, experience and effort for successful completion. We hope that this document would provide guidance to practicing doctors and researchers for the management of buccal mucosa cancer patients and also focusing their research efforts in Indian context.

It is understood that this document represents the current thinking of national experts on this topic based on available evidence and will have to be revised as we move. Mention of drugs and clinical tests for therapy do not imply endorsement or recommendation for their use, these are examples to guide clinicians in complex decision making. We are confident that this first edition of document will serve the desired purpose.



Dr. V.M. Katoch  
Secretary, Department of Health Research  
and Director General, ICMR

## Message

I take this opportunity to thank Indian Council of Medical Research and all the expert members of the subcommittees for having faith in me and considering me as Chairperson of ICMR Task Force project on Guidelines for Management of Cancer.



The Task Force on Management of Cancers has been constituted to plan various research projects. Two sub-committees were constituted initially to review the literature on management practices. Subsequently, it was expanded to include more sub-committees to review the literature related to guidelines for management of various sites of cancers. The selected cancer sites are lung, breast, oesophagus, cervix, uterus, stomach, gall bladder, soft tissue sarcoma and osteo-sarcoma, tongue, acute myeloid leukaemia, acute lymphoblastic leukaemia, CLL, Non Hodgkin's Lymphoma-high grade, Non Hodgkin's Lymphoma-low grade, Hodgkin's Disease, Multiple Myeloma, Myelodysplastic Syndrome and paediatric lymphoma. All aspects related to management were considered including, specific anti-cancer treatment, supportive care, palliative care, molecular markers, epidemiological and clinical aspects. The published literature till December 2012 was reviewed while formulating consensus document and accordingly recommendations are made.

Now that I have spent over a quarter of a century devoting my career to the fight against cancer, I have witnessed how this disease drastically alters the lives of patients and their families. The theme behind the designing of the consensus document for management of cancers associated with various sites of body is to encourage all the eminent scientists and clinicians to actively participate in the diagnosis and treatment of cancers and provide educational information and support services to the patients and researchers. The assessment of the public-health importance of the disease has been hampered by the lack of common methods to investigate the overall; worldwide burden. The ICMR's National Cancer Registry Programme (NCRP) routinely collects data on cancer incidence, mortality and morbidity in India through its co-coordinating activities across the country since 1982 by the Population Based and Hospital Based Cancer Registries and witnessed the rise in cancer cases. Based upon NCRP's three year report of PBCR's (2009-2011) and Time trends on Cancer Incidence rates report, the burden of cancer in the country has increased many fold.

In summary, the Consensus Document for management of various cancer sites integrates diagnostic and prognostic criteria with supportive and palliative care that serve our three-part mission of clinical service, education and research. Widespread use of the consensus documents will further help us to improve the document in future and thus overall optimizing the outcome of patients. I, thank all the eminent faculties and scientists for the excellent work and urge all the practicing oncologists to use the document and give us valuable inputs.

A handwritten signature in blue ink, appearing to read 'G.K. Rath'.

(Dr. G.K. Rath)  
Chairperson  
ICMR Task Force Project

## Preface

Carcinoma of Head and Neck accounts for around 30% of all cancers in male as per the recent consolidated report of the Hospital Based Cancer Registry (2009-2011) of National Cancer Registry program (NCRP). Carcinoma of mouth (excepting tongue) is the leading site of cancer in males in Mumbai and within the five leading sites in all registries in both the males and females except males and females in Chandigarh and in females in Dibrugarh. Carcinoma of Buccal mucosa is relatively uncommon in developed world but common in India owing to extensive use of tobacco in various forms particularly chewable tobacco. Majority of the patient (70-80%) present in fairly advanced stage and the nature of presentation, site (for example gigno-buccal sulcus), biological behavior and treatment also is different. There is lack of consensus over management of buccal mucosa cancers including role of concurrent chemo-radiation, induction chemotherapy, palliative chemotherapy etc. particularly in context of Indian sub-continent. The consensus evidence (NCCN, ESMO) for this sub-site of cancer is mainly based on experience in western countries. Cancer treatment facilities as well as diagnostic modalities are not available at all the places in India and the guidelines may not be applicable to all cancer centers. Need of consensus document for the management of buccal mucosa cancers has been strongly felt. A panel of experts which included radiation oncologist, onco-surgeons, and medical oncologist together drafted this consensus document (by incorporating relevant literature till December 2012) which covers the published evidence, diagnostic modalities, staging and treatment of buccal mucosa cancer in Indian setting. Basic principles of surgery, chemotherapy as well as radiotherapy are discussed and future research issues have also been highlighted.



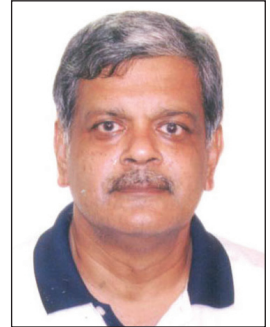
The document has been designed to optimize the outcome of the patients based on the available as well as the resources at majority of the regional cancer centers. This will bring uniformity in the practice of this disease at various cancer treatment centers and thus promote seamless collaborative studies to address India specific research questions.

A handwritten signature in blue ink, appearing to read 'GK Rath'.

(Dr. GK Rath)  
Chairperson,  
Subcommittee on Buccal Mucosa Cancer

# Preface

Cancer is a leading cause of death worldwide. Globally cancer of various types effect millions of population and lead to loss of lives. According to the available data through our comprehensive nationwide registries on cancer incidence, prevalence and mortality in India among males; cancers of lung, mouth, oesophagus and stomach are leading sites of cancer and among females cancer of breast and cervix are leading sites. Literature on management and treatment of various cancers in west is widely available but data in Indian context is sparse. Cancer of gall bladder and oesophagus followed by cancer of breast marks as leading site in North-Eastern states. Therefore, cancer research and management practices become one of the crucial tasks of importance for effective management and clinical care for patient in any country. Hence, the need to develop a nationwide consensus for clinical management and treatment for various cancers was felt.



The consensus document is based on review of available evidence about effective management and treatment of cancers in Indian setting by an expert multidisciplinary team of oncologists whose endless efforts, comments, reviews and discussions helped in shaping this document to its current form. This document also represents as first leading step towards development of guidelines for various other cancer specific sites in future ahead. Development of these guidelines will ensure significant contribution in successful management and treatment of cancer and best care made available to patients.

I hope this document would help practicing doctors, clinicians, researchers and patients in complex decision making process in management of the disease. However, constant revision of the document forms another crucial task in future. With this, I would like to acknowledge the valuable contributions of all members of the Expert Committee in formulating, drafting and finalizing these national comprehensive guidelines which would bring uniformity in management and treatment of disease across the length and breadth of our country.

A handwritten signature in blue ink, appearing to read 'D.K. Shukla', written over a horizontal line.

(Dr.D.K.Shukla)  
Head, NCD Division

## Acknowledgement

The Consensus Document on Management of Cancer is a concerted outcome of effort made by experts of varied disciplines of oncology across the nation. The Indian Council of Medical Research has constituted various sub committees to formulate the document for management of different cancer sites. The Task Force on Management of Cancers has been constituted to formulate the guidelines for management of cancer sites. The sub-committees were constituted to review the literature related to management and treatment practices being adopted nationally and internationally of different cancer sites. The selected cancer sites are that of lung, breast, oesophagus, cervix, uterus, stomach, gall bladder, soft tissue sarcoma and osteo-sarcoma, tongue, acute myeloid leukaemia, ALL, CLL, NHL-high grade, NHL-low grade, HD, MM, MDS, and paediatric lymphoma. All aspects related to treatment were considered including specific anti-cancer treatment, supportive care, palliative care, molecular markers, epidemiological and clinical aspects.



This document represents a joint effort of large number of individuals and it is my pleasure to acknowledge the dedication and determination of each member who worked tirelessly in completion of the document.

I would like to take this opportunity to thank Dr. GK Rath, chairperson, ICMR Task Force on Guidelines for Management of Cancer for his constant guidance and review in drafting the consensus document. The chairperson of subcommittee is specially acknowledged in getting the members together, organizing the meetings and drafting the document.

I would like to express gratitude to Dr. VM Katoch, Secretary, Department of Health Research and Director General, Indian Council of Medical Research, for taking his special interest and understanding the need of formulating the guidelines which are expected to help the cancer patients.

I would like to acknowledge here the initiative undertaken under the able guidance of Dr. Bela Shah. I would like to thank Dr. DK Shukla for his support and coordination in finalizing this document. I would also like to acknowledge the assistance provided by administrative staff. This document is the result of the deliberations by subcommittees constituted for this purpose. The guidelines were further ratified by circulation to extended group of researchers and practitioners drawn from all over the country. It is hoped that these guidelines will help the practicing doctors to treat cancer patients effectively and thus help them to lead a normal and healthy life.

The ICMR appreciatively acknowledges the valuable contribution of the members for extending their support in formulating these guidelines. The data inputs provided by National Cancer Registry Programme are gratefully acknowledged.

A handwritten signature in blue ink that reads "Tanvir Kaur".

(Dr. Tanvir Kaur)  
Programme Officer & Coordinator

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## TABLE OF CONTENTS

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Foreword	(i)
Message from Chairperson	(ii)
Preface (Chairperson of Subcommittee)	(iii)
Preface	(iv)
Acknowledgement	(v)
1. Introduction	1
2. Existing guidelines	2
3. Review of published data	3
4. Summary of published literature	7
5. Diagnostic workup	10
6. Staging	11
7. Treatment	12
8. Stagewise Treatment of Buccal Mucosa Cancer	18
9. Research issues	22
10. Bibliography	23



Carcinoma of the Buccal Mucosa is the commonest oral cavity cancer in India. As per the data available from the National Cancer Registry Programme (Population Based Cancer Registries), of the Indian Council of Medical Research, the males of Ahmedabad urban showed highest Age Adjusted Rate (AAR) for mouth cancer (12.9) followed by Bhopal (9.9). For females however, Bengaluru showed the highest AAR (6.5) followed by Kamrup urban district (5.8)<sup>1</sup>. In the Hospital Based Cancer Registry report, cancer of the mouth is also ranked as the leading site in Mumbai in males and was within the first five leading sites in all registries in males<sup>2</sup>. In the developed countries, carcinoma Buccal Mucosa is relatively uncommon as compared to the Indian subcontinent<sup>3</sup>. The high incidence of carcinoma of the Buccal Mucosa in our country is attributable to the extensive use of tobacco in various forms and the locally advanced cancers account for about 70% of the cases at the time of presentation.

The reported 5 year survival rates for Buccal Mucosa cancers in India ranges from 80% for stage I disease to 5-15% for locally advanced disease<sup>4-5</sup>. There is lack of consensus over the use of surgery, radiotherapy and chemotherapy in the treatment of advanced Buccal Mucosa cancers. This includes sequence/combination of the different modalities and the use of concurrent chemo-radiotherapy. Recurrent disease after surgery and/or radiotherapy is difficult to salvage and therefore it is necessary to provide optimum, state of the art, evidence based care to patients to improve cure rates with minimum morbidity and good quality of life. Providing treating doctors with uniform guidelines for the management of Buccal Mucosa cancer appears to be an appropriate step forward in achieving this goal.

Several international consensus guidelines are available for the management of oral cavity cancers, but none them addresses Buccal Mucosa cancers in particular. Therefore, formulating reliable guidelines based on western data is questionable given the fact that Buccal Mucosa tumors are quite rare in the developed countries. A recent publication from Australia is based on the report of only 32 cases of Buccal Mucosa cancer<sup>6</sup>. There is obviously an urgent need to formulate consensus statement for the management of carcinoma of Buccal Mucosa based on Indian data and experience which would not only incorporate the evidence available but would also be feasible to be practiced in the hospitals of India. The following part of this chapter provides some of the existing National and International guidelines for oral cavity cancer and reviews the applicability of the given guidelines for patients with carcinoma of Buccal Mucosa, especially in Indian context. A short review of the National and International data on Buccal Mucosa cancer is provided. The proposed national consensus document for Buccal Mucosa cancer is presented. Some of the key areas of research relevant to our country have also been mentioned.

# 2

## EXISTING GUIDELINES

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**The sources of the current guidelines available for management of Buccal Mucosa cancer are:**

- 1) National Comprehensive Cancer Network (NCCN)<sup>7</sup>.
- 2) Indian Comprehensive Cancer Network (ICCN)<sup>8</sup>.
- 3) National Health Services (NHS)<sup>9</sup>.
- 4) European Society of Medical Oncology (ESMO)<sup>10</sup>.
- 5) TMH textbook on evidence based medicine<sup>11</sup>.

The NCCN guidelines are most widely followed and quoted. While these provide the general principles for the management of oral cavity tumors, they do not address specific issues pertaining to cancer of the Buccal Mucosa which is more prevalent in our part of the world.

Interpretation and practice of the existing guidelines needs to be done with caution considering the following facts:

1. Many of published guidelines including that from TMH and ICCN are based on evidence in other Head & Neck disease sub sites from western experience.
2. There is a dearth of randomized, prospective studies from Indian subcontinent on chemoradiation (CT+RT), induction chemotherapy and palliative chemotherapy in Buccal Mucosa cancers.
3. Oral cancer in India is different compared to the western countries. Here it involves the gingivo buccal sulcus (the site where the tobacco quid is kept by the patient). These cancers are also more likely to present in higher stage (stage III and stage IV) with higher risk of failure at local site. The nature of spread, biological behavior and the treatment is also different.

In the absence of international and national data specifically on Buccal Mucosa cancer (large, randomized, prospective case series and trials), literatures of head and neck cancers in general has been reviewed.

*Analysis of the available Indian literature revealed information on the following aspects.*

- a) Epidemiological studies on Carcinoma Buccal Mucosa.
- b) Studies evaluating the role of clinical and molecular markers in the prognostication of oral cancers.
- c) Treatment experiences.

The following highlights only the studies which report on treatment outcomes.

An early publication on cancer of the Buccal Mucosa from India was in the year 1966 (Singh et al)<sup>12</sup>. In 1989, Pradhan et al reported the treatment outcome of these cancers in detail<sup>4</sup>. Sixty six percent of patients in this series had T4 lesions. At 18 months follow-up, it was reported that post operative radiotherapy (PORT) significantly improved disease free survival. Author also reported that patients with poorly differentiated squamous cell tumors fared worse (no survivor at 18 months of follow up). Similar experience was reported by Mishra et al<sup>13</sup>. PORT was found to improve survival of patients with T3 and T4 Buccal Mucosa cancer from 38% to 68%. Krishnamurthy et al from Cancer Institute, Adyar reported their experience on Buccal Mucosa cancers in 1971<sup>14</sup>. Ninety three percent of patients in this series had T3 and T4 lesions and 5 year survival with single modality treatment was 19-20%. Post operative RT became standard treatment in locally advanced disease in India. Dinshaw et al reported a relapse rate of around 50% in oral cavity tumors after post operative radiotherapy in locally advanced disease<sup>15</sup>. In this report, Dinshaw et al reviewed the role of radiotherapy in all head and neck tumors over 15 years, which suggested that adjuvant RT is a preferred method of treatment while at the same time, dose modification in RT or addition of CT with RT should be studied, because, in spite of surgery and post operative RT (60Gy), the patients with Buccal Mucosa cancers did not fare well. Bahadur et al<sup>16</sup> from the All India Institute of Medical Sciences, New Delhi reported their experience of treating locally advanced head and neck cancer with combination of surgery and RT. They treated 252 cases of stage III and IV resectable cancers of the head and neck region by a combined regime of pre or post operative RT and radical surgery. Only 193 patients completed the planned treatment protocol. There were 58 cases (33.5%) who failed either at the primary or regional sites or both. Nine cases (5%) developed distant metastasis. Absolute and determinate 4-year disease free survival was 55% and 61% respectively. They concluded that a reduction in primary and regional failures correlates well with a combined modality therapy.

The dose of radiation in the post operative setting has not been confirmed by Indian studies. Two publications, one from the All India Institute of Medical Sciences, New Delhi<sup>16</sup> and the other from Siddhi Vinayak Cancer Hospital, Miraj<sup>17</sup> have utilized doses up to 60 Gy postoperatively. They concluded that this dose is not sufficient to make an impact on disease free or overall survival in patients with high risk

features<sup>16-17</sup>. The number of patients in these series was less but they identified the need for optimal dose of radiation in the post operative setting in Buccal Mucosa cancer. NCCN guidelines (ver 1. 2012) have now confirmed that RT doses upto 66 Gy should be considered in the adjuvant setting. For early localized disease of Buccal Mucosa, the report by Iyer et al<sup>5</sup> from TMH showed very good overall survival after peroral wide excision<sup>5</sup>. Poorly differentiated histological grade of tumor was associated with poor outcome identifying a subset that would potentially benefit from adjuvant systemic treatment.

One of the largest reported series on outcome in Buccal Mucosa cancer is from the M.D. Anderson Cancer Hospital, Texas, USA<sup>18</sup> reporting on 119 patients with invasive Buccal Mucosa cancer. All patients were surgically treated. None of them received definitive radiation. In patients with early stage disease, the relapse rate was up to 45%. In view of high relapse rate in patients with N0 disease, authors suggested some form of adjuvant treatment in all patients with early disease and high risk tumors. They concluded that Buccal Mucosa cancer is a different disease biologically as compared to the rest of head and neck cancers and requires aggressive treatment. Lee et al reported treatment outcome of 32 patients of Buccal Mucosa cancer over 10 years<sup>6</sup>. Though a small series, the authors report 50% relapse rate in spite of post operative radiation. They concluded that Buccal Mucosa sub site is an aggressive form of oral cavity cancer and multimodality treatment should be offered to as many as possible.

There are few reports from the developing world as well on Buccal Mucosa cancer. Lin et al reported on the outcome of 121 patients with Buccal Mucosa cancer treated with curative intent<sup>19</sup>. This paper represents one of the largest data on this cancer from this part of the world. The authors opined that Buccal Mucosa cancer represents one of the aggressive tumors of oral cavity. Hence, it needs to be treated more aggressively as compared to the rest of the head and neck tumors. Forty percent of patients relapsed after surgery in T1 and T2 N0 M0 disease. The exact reasons for this are unclear as details of high risk factors are not reported. Pathak's (2009) report on Buccal Mucosa cancer compares sixty four patients from India with identical number from Canada in terms of outcome<sup>20</sup>. Indian patients fared better in terms of 5 year survival. Authors cite older age at presentation in Canadian patients as the reason for this differential outcome. Interestingly, 5 year survival reported in this study is one of the best so far from India (67%). Frequent use of adjuvant systemic therapy as well as a multimodality approach may be responsible for these improved results. This is corroborated by the poorer outcome reported by Pandey et al wherein survival was 54% in patients with carcinoma Buccal Mucosa when treated using single modality treatment (primary aim of report was to compare initial vs salvage surgery)<sup>21</sup>. There are few studies reported in the literature with regard to the prognostic factors associated with clinical outcome of Buccal Mucosa cancers. Mishra et al reported the relation between treatment failure and tumor thickness in a series of 176 patients with early Buccal Mucosa cancer<sup>22</sup>. Tumor thickness of more than 4 mm was found to be associated with lymph node metastases. In another review, Borges et al studied in detail the pathologic outcomes in 79 patients with Buccal Mucosa cancer<sup>23</sup>. Tumor thickness of 5 mm was found to be associated with nodal metastases even in clinical N0 neck. Supra omohyoid neck dissection in high risk patients with Buccal Mucosa cancers may be considered the surgery of choice and can save patients from facing morbidity associated with radical neck dissection.

The report from Mount Sinai, USA on oral cavity tumors and prognostic factors<sup>24</sup> highlights the importance of pathologic risk assessment for adjuvant post operative RT. They reported that margin status and tumor thickness were not correct predictors of relapse. Patients with T1 and T2 disease receiving adjuvant RT did better compared to patients with single modality treatment. One major draw back of this paper was that there were four groups of patients, each consisting of small numbers and overlapping with the other. It is doubtful whether this study was adequately powered to draw definite conclusions

regarding the significance of margin status. The surgical margin has been studied in almost every trial of head and neck cancer and has been uniformly accepted as one of the important prognostic markers worldwide. Iype et al reported the treatment outcome in young patients (<35 years) in a small series of 46 patients with Buccal Mucosa cancer<sup>25</sup>. In this study nonsmokers did worse compared to smokers. The same author also reported a series of 261 young patients, out of which 69 were having Buccal Mucosa cancer<sup>26</sup>. Forty percent of these patients were non tobacco habitués. Kuriakose et al reported on young patients from Kerala with oral cavity cancers<sup>27</sup>. They also reported a different biologic behavior in this cohort as compared to older patients. With more and more young patients being diagnosed with Buccal Mucosa cancer in India, this article suggests the need to explore new avenues for research on finding newer ways to treat young individuals. Malaysia, Pakistan and Brazil have reported the epidemiological outcomes in oral cavity tumors<sup>28-30</sup>. These papers have not mentioned treatment outcomes.

**In summary, the available literature for Buccal Mucosa cancers highlights the following facts:**

1. The largest data on Buccal Mucosa cancers is from India to the best of our knowledge.
2. About 70% of the patients with this cancer are locally advanced at the time of presentation.
3. More and more patients are diagnosed at relatively younger age and these patients may have a different biologic disease as compared to older patients.
4. The treatment options considered for these locally advanced Buccal Mucosa tumors are surgery in combination with radiotherapy or radiotherapy alone. The role of concurrent chemoradiotherapy or post operative chemoradiotherapy specifically for the subset of patients with Buccal Mucosa cancer have not been studied in randomized trials. The data available from studies in head and neck cancers in general show that combined modality treatment i.e. concurrent chemoradiotherapy is better than radiotherapy alone, both in the definitive and adjuvant settings [MACH-NC meta-analysis<sup>31-33</sup>]
5. Thirty to forty percent of patients with T2N0M0 disease relapse after single modality treatment (especially patients with T2 and tumor thickness more than 4 mm). This was evident in three large series from India incorporating more than 700 patients (Mishra et al, Pradhan et al, and Dinshaw et al) and from China and Australia. The exact reasons for this is yet unclear and requires randomized studies to identify patients with early stage high risk features who may benefit from multi modality treatment approaches. In the absence of such randomized adequately powered studies, the best currently available data is from case series reported till now. They indicate that adjuvant treatment in such cases can improve outcomes.
6. Prognostic factors in patients with Buccal Mucosa cancer need further studies. Data from India highlight the importance of tumor thickness in the outcome of these tumors. Data from other sub sites in head and neck cancers suggest that tumor thickness, extra capsular spread, perineural invasion, lymphovascular invasion, nodal metastases, surgical margins, grade of tumor differentiation are some of the prognostic markers to predict relapse.
7. There are few studies on induction chemotherapy or concurrent chemotherapy from India in randomized settings in head and neck cancer patients including Buccal Mucosa cancer and one large retrospective study<sup>34-37</sup>.
8. There is limited data on palliative chemotherapy or radiotherapy, in advanced disease<sup>38-40</sup>.
9. Role of concurrent chemoradiation in Buccal Mucosa cancers is not defined. This has been shown to be an acceptable alternative to surgery and RT in T3-T4 head & neck lesions<sup>32</sup>. Given the fact that Buccal Mucosa cancers represent a relatively more aggressive subsite, addition of chemoradiation

in adjuvant setting has the potential to be beneficial. This would be an area for further clinical research.

10. There is no category I evidence for induction chemotherapy in operable cancers. This approach may be considered in borderline operable tumors to enhance respectability<sup>41-42</sup>.
11. In the metastatic setting, treatment decision should be based on patient's symptoms and performance status. Systemic dissemination at presentation is a rarity for Buccal Mucosal cancers. If the patient has an asymptomatic metastatic deposit and/or advanced symptomatic locoregional disease, palliative radiotherapy or systemic chemotherapy are the two options for palliation. In the event of symptomatic systemic disease/ progressive disease after RT, chemotherapy (multiagent or single agent) should be considered.
12. Newer molecular agents: EGFR receptor antagonists are available in India. Cetuximab + Cisplatin+ 5FU has been shown to be superior to Cisplatin + 5FU with benefit in survival for recurrent / metastatic head & neck cancer. The applicability of these results in Buccal Mucosa cancers in India requires validation<sup>43-46</sup>.
13. An effective chemoprevention agent is not available.
14. Screening for early detection for high risk patients have been reported to decrease mortality. Efforts to increase public awareness and effective screening procedures by integration into the health care delivery systems would go a long way towards effectively controlling this cancer.
15. Several areas of clinical and basic research still remain to be conducted before all questions regarding the optimum treatment of this cancer can be answered. India having the largest patient population with this cancer needs to conduct well organized randomized trials addressing key areas of research.



Author/ Institute/ Group	Study subjects	Results	Comments
Singh AD et al 1966 <sup>12</sup>	362 patients with Buccal Mucosa in south India.	60% of patients were not treated. 30 % treated with RT & 9% with surgery.	First publication from India on Buccal Mucosa cancer establishing the association of tobacco with causation of cancer of Buccal Mucosa.
Von Essen CF et al 1968 <sup>47</sup>	100 patients receiving Sequential chemotherapy and radiotherapy in Buccal Mucosa cancer from south India.	20-30% tumor regression seen in patients treated with chemotherapy (MTX, 5-FU).	First paper on the effect of chemotherapy from India. Very encouraging results.
Krishnamurthy S et al 1971 <sup>14</sup>	927 patients receiving combined treatment in Buccal Mucosa cancer (93% of patients had locally advanced disease).	39% of patients had disease under control after treatment. 69% of these 39% patients survived long term.	Largest study on Buccal Mucosa cancer from India.
Nair MK 1988 <sup>48</sup>	234 patients with Buccal Mucosa cancer treated with radiotherapy only.	Overall 3 year DFS: 42%; stage I: 85%; stage II: 63%; stage III: 41%; stage IV: 15%.	Radiotherapy alone is an effective modality and has a potential to cure patients with Buccal Mucosa cancer
Borges AM et al 1989 <sup>23</sup>	Surgical pathology of Buccal Mucosa cancers and outcome correlation.	Tumor thickness greater than 5 mm associated with nodal metastases. Very poor prognosis in pathologically positive nodal disease .Low incidence of neck node metastasis even in presence of large T tumors.	Carcinoma of Buccal Mucosa is very aggressive and biologically different disease.
Pradhan SA et al 1989 <sup>4</sup>	Patients with Buccal Mucosa cancer in TMH. 2/3 <sup>rd</sup> patients had locally advanced disease.	PORT better than surgery alone. No survivors in poorly differentiated tumors.	Follow-up in 18 months which is short. All locally advanced Buccal Mucosa cancer need adjuvant therapy.

Mishra RC et al 1996 <sup>13</sup>	Effect of PORT in patients with Buccal Mucosa cancer.	Postoperative radiotherapy improved survival to 68% as compared to 38% in surgery alone arm.	Randomized study though with small number of patients. Role of PORT in randomized setting established.
Mishra RC et al 1999 <sup>22</sup>	Tumor thickness & locoregional failure in cancer of Buccal Mucosa in 176 patients with early stage disease.	T stage, type of surgery, tumor thickness of 4 mm were factors responsible for local failure following surgery.	T2 disease in Buccal Mucosa cancer is associated with high failure rates; needs adjuvant treatment.
Iype EM et al 2001 <sup>26</sup>	264 patients (69 with carcinoma Buccal Mucosa) of Oral cancer aged < 35 years.	5 year survival in these young patients was 57.3%. Higher T stage was associated with increased local failure rate.	Ca Buccal Mucosa behaves similarly in young patients as compared to older patients.
Yeole BB et al 2003 <sup>49</sup>	Survival from oral cancer in Mumbai. Results from cancer registry, 1808 patients data.	5 year OS: 30%. Survival of patients with tongue, Buccal Mucosa and retromolar trigone is poorer.	Buccal mucosa cancer is aggressive cancer. Needs to be treated differently compared to rest of the oral cavity cancers.
Iyer IM et al 2004 <sup>5</sup>	46 patients with squamous cell cancer of Buccal Mucosa aged < 35 years.	5 year DFS was 61%. Non-smokers did worse compared to smokers.	Biology of non smokers with Buccal Mucosa cancers need to be studied.
Badakh DK et al 2005 <sup>17</sup>	Phase II study of 94 patients with Buccal mucosa cancer treated with PORT.	Patients with positive surgical margins did poorly. Dose of 60 Gy probably is not enough in post operative setting.	RT dose intensification & altered fractionation needs to be studied in post operative setting in Buccal Mucosa cancer.
Bahadur et al 1992 <sup>16</sup>	252 cases of stage III-IV resectable cancers of the head and neck treated by combined use of pre or post operative RT and radical surgery.	Absolute and determinate 4 year disease free survival was 55% and 61% respectively.	Reduction in primary and regional failures correlated well with a combined therapy.

## International Data

Author	Study subjects	Results	Comments
Fang FM et al 1997 <sup>50</sup>	Combined modality treatment for SCC Buccal Mucosa. 57 patients study from Taiwan.	3 year DFS & OS: 62% & 55%. Tumor invasion of skin of cheek was the only prognostic factor.	Small study but emphasizing the need to study prognostic factors in specific manner.
Sakai M et al 1998 <sup>51</sup>	Role of RT in Buccal Mucosa cancer. 55 patients study from Chiba.	5 Overall survival: 48%.	RT with/without brachytherapy is comparable to surgery in early stages of Buccal Mucosa cancer.
E.M. Diaz et al 2003 <sup>52</sup>	Clinical outcome of squamous cell carcinoma of Buccal Mucosa. 119 patients data from M.D. Anderson cancer hospital, Texas.	5 year OS for T1: 78%; T2 : 66%. Salvage surgeries were rarely successful.	High incidence of local failure rate in T2 Buccal Mucosa cancer. Need to be aggressively treated.
Lee KH et al 2005 <sup>6</sup>	Role of combined modality in ca Buccal Mucosa. 31 patients from Australia.	3 year DFS & OS: 47 & 55%.	Too small a study for drawing any conclusion.
Lin CS et al 2006 <sup>19</sup>	Clinical outcome of squamous cell carcinoma of Buccal Mucosa in 121 patients from China.	5 year DFS & OS was 36.3 & 34.3%. 41 % of patients with T1-2 disease recurred.	Buccal mucosa is intrinsic aggressive cancer. PORT in these patients should be incorporated along with locally advanced disease.

Evaluation of a patient presenting with a lesion in the Buccal Mucosa should be aimed at pathological confirmation and staging of the disease

### Essential

1. History and physical examination
2. Biopsy of the primary lesion
3. Complete Blood counts, Renal Function Tests including Creatinine clearance & Liver Function Tests.
4. Chest X-Ray
5. Ultra Sonogram of the neck in patients with no clinically enlarged neck nodes.
6. Dental evaluation
7. CT scan except in patients with early lesions and clinically and USG proven N0 neck

### Ideal

1. Ortho Pantomogram (OPG)\* or plain radiograph of mandible if the lesion extends to lower GB sulcus or lower alveolus.
2. CT Scan / MRI #
3. PET-CT where indicated
4. Evaluation under anesthesia when clinical examination is not feasible.
5. Human Papilloma Virus (HPV)

\*Ortho Pantomogram is indicated only in those lesions involving lower gingivo buccal sulcus.

#CT Scan of the head and neck region is advisable in the following situations:

- *Clinically the mandible is involved and OPG is negative.*
- *Lesion is involving the retromolar trigone and/or there is suspected involvement of pterygoids or pterygoid plate.*
- *Lesion is extending into the upper gingivo buccal sulcus and there is suspicious involvement of Para Nasal Sinuses.*
- *There is a need to assess the operability of cervical lymph nodes.*

**Extensive investigations should be discouraged in the following situations (intention of treatment: palliation)**

- Hard and fixed N3 nodes
- Extensive skin involvement with or without cutaneous nodules
- Severe trismus not due to oral submucous fibrosis (OSMF)
- Clinical involvement of infra temporal fossa

Staging system for Carcinoma Oral Cavity is used. There is no specific system for staging and grouping of Carcinoma Buccal Mucosa.

AJCC Staging in Head Neck Squamous Cell Carcinoma is as follows :

Oral Cavity	
Tx	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor 2cm or less in the greatest diameter
T2	Tumor >2cm but <4cm in the greatest diameter
T3	Tumor > 4cm in the greatest diameter
T4	T4 lesions have been divided into T4a (resectable) and T4b unresectable) leading to the division of Stage IV into Stage IVA, Stage IV B and Stage IVC.
T4a (oral cavity)	Tumor invades adjacent structures (eg. through cortical bone, into deep (extrinsic) muscle of the tongue (genioglossus, hyoglossus, palatoglossus and styloglossus), maxillary sinus, skin of face).
T4b	Tumor invades masticator space, pterygoid plates, or skull base and/or encases internal carotid artery.

Neck Nodes	
Nx	Regional LN cannot be assessed
N0	No regional LN metastasis
N1	Ipsilateral Single node <3cm
N2a	Ipsilateral Single node 3-6 cm
N2b	Ipsilateral multiple node <6cm
N2c	Bilateral/Contralateral nodes <6cm
N3	Lymph node >6cm

	N0	N1	N2	N3
Tis	Stage 0	Stage III	Stage IV A	Stage IV B
T1	Stage 1			
T2	Stage II			
T3				
T4a				
T4b				
Stage IVC	Any T Any N Any MT			

**T**reatment decisions are based on the stage of the tumor. The aim of treatment is “curative” for patients with Stage I to IVA and “palliative” for patients with Stage IVB (locoregionally advanced disease), & IV C (metastatic disease). Surgery and Radiotherapy/chemoradiotherapy, either alone or in combination are the therapies of choice for the treatment of Buccal Mucosa with curative intent. Although Chemotherapy alone is not recommended as a curative treatment for this disease, optimum methods to integrate it in the curative treatment of buccal cancers has the potential to improve outcome. All options of treatment, their benefits and toxicities should be discussed with the patient and/or legally authorized representatives prior to commencement of treatment.

### 7.1 EARLY STAGE (STAGE I AND II) DISEASE

#### Options: (Both Essential)

- (i) Surgery (adjuvant treatment to be decided after histopathology report)
- (ii) Radical Radiotherapy
  - (a) Brachytherapy
  - (b) External Beam Radiotherapy (EBRT)+/- Brachytherapy boost

#### 7.1.1 Surgery:

**Wide Excision and Ipsilateral Supra Omohyoid Neck Dissection** (which includes Level I, II, III dissection) is the procedure of choice in early stage disease.

Supra omohyoid neck dissection (SOHND) may be avoided if the patient is highly compliant and if the patient has the following disease characteristics:

- T1
- Node negative status proven by ultrasonography.
- Histologically well differentiated lesions
- Thickness of infiltration 4 mm

Once surgery is done, a detailed pathological examination is required to confirm the pathological stage of the disease and completeness of surgery and prognostication.

#### Histopathology Report

The detailed postoperative histopathology report should contain the following information.

#### Gross

- Appearance
- Localised extent of lesion

- Tumor dimensions including depth
- Distance from the various margins of excision
- Nodal dissection

### Microscopy

- Histological type
- Grade
- Extent of disease including depth of infiltration
- Presence or absence of extra capsular spread
- Presence or absence of lymphovascular invasion
- Presence or absence of perineural invasion
- Bone / cartilage/ skin/ soft tissue involvement
- Margins of excision, submucosal spread, in situ changes
- Nodal status-number and size of nodes, perinodal extension and level of nodes

### Indications for adjuvant treatment

- **Margin status:**

All patients with close/ positive margin should be considered for re-excision. If the patient is not a candidate for the same, PORT should be considered.

- **Nodal status:**

Multiple nodes positive disease requires post operative treatment (CT+RT) as for stage IV A disease. In single node positive disease (Stage III) the role of RT is controversial.

- **Extra capsular spread:**

Post operative chemoradiation should be given.

### Postoperative Radiotherapy:

The minimum required post op RT dose is 60 Gy at 1.8-2 Gy/fr. This may be delivered in a phased manner. The initial phase would deliver 44Gy in 22 fractions over four and a half weeks to the primary and nodal areas using conventional treatment planning, 3DCRT or IMRT<sup>53</sup>. Every effort should be made to spare the contralateral parotids. In the second phase the spinal cord should be shielded and dose delivered to receive a minimum of 60 Gy. In presence of margin positive disease or extracapsular spread 66Gy is the recommended dose. This may be achieved using electrons or photon boost.

### 7.1.2 Radical Radiotherapy:

#### Brachytherapy

Interstitial brachytherapy alone is a safe and short duration treatment considered for highly compliant individuals with the following tumor characteristics:

- Early lesions preferably <2 cms
- Accessible lesions
- Histologically well differentiated lesions
- Superficial lesions
- Lesions situated well away from the bone
- Node negative status proven by ultrasonography

Brachytherapy may be delivered using low dose rate<sup>54</sup> or high dose rate systems. Typically dose prescription encompasses the primary with 1.0-1.5 cm margins. The regional nodes are not addressed at this time of treatment.

Brachytherapy dose:

- Low dose rate brachytherapy (LDR) 65-70Gy / 6-7 days
- High dose rate brachytherapy (HDR) 48Gy/12fr 4Gy BD x 6 days

### **EBRT +/- brachytherapy boost**

Patients who are not suitable for brachytherapy may be treated with EBRT. EBRT is delivered using conventional planning /3DCRT/IMRT to doses of 66-70Gy at 1.8 to 2 Gy per fraction over 7-8 weeks (or a biologically equivalent dose) with adequate margins all around the lesion and including level I and II nodes. Neck needs to be observed through close follow up. In conventional radiotherapy planning, initial lateral portals are treated to 44Gy in 22 fractions / over 4.5 weeks, followed by 12-16 Gy after spine shielding. Dose of EBRT is restricted to 45-50Gy if interstitial boost {dose of 20-25 Gy (LDR) or equivalent HDR} is given.

### **Principles of RT planning:**

- Immobilization to be used for all patients
- Use of compensators wherever needed
- Treatment machine: Linear Accelerator (4-6 MV) or Cobalt 60 Unit
- Techniques to spare the opposite parotid.
- 3DCRT /IMRT may be employed if available.

### **Chemotherapy in chemoradiation:**

- Cisplatin is the preferred agent.
- Weekly cisplatin 30 mg/m<sup>2</sup> is practiced at many centers. Minimum cumulative dose needs to be 200 mg/m<sup>2</sup>.
- In three weekly regimen, the dose of cisplatin recommended is 100 mg/m<sup>2</sup> every three weekly i.e on day 1, 22, and 43 of radiotherapy.
- Monoclonal antibody therapy directed against EGFR (cetuximab and nimotuzumab) added to radiation therapy improves outcome, however, there is no evidence in the Indian literature and cost benefit ratio may be considered before taking a decision.
- In patients who are not candidates for cisplatin, carboplatin and paclitaxel is the regime of choice for chemoradiation.
- Feeding through nasogastric tube, gastrostomy or jejunostomy is strongly recommended during chemoradiation.

### **7.2 LOCALLY ADVANCED (STAGE III & IV A) DISEASE:**

(T3, T4a or any node positive (except N3) disease).

Such patients should always be offered radical combined modality treatment.

#### **Options (All Essential)**

- (i) Surgery -----> RT+/-CT
- (ii) CT+RT



- (iii) Altered fractionation schedules
- (iv) Induction chemotherapy + surgery + RT

### 7.2.1 Surgery+ RT+/-CT

#### Basic principles of surgery

- Treatment of primary
- Treatment of neck
- Surgical reconstruction

**Treatment of primary:** Aim is to widely excise the tumor to obtain negative margins (0.5 to 1 cm) all around.

**Treatment of neck:** Modified radical neck dissection is the procedure of choice. Extended Supra Omohyoid dissection is followed by Modified Radical Neck dissection if (i) matted lymphnodes (ii) extensive cervical lymph nodes involvement per operatively and (iii) if nodes are positive on frozen section.

**Surgical reconstruction:** Segmental mandibulectomy should be avoided just to facilitate access to primary cancers of oral cavity.

#### Indications for marginal/segmental mandibulectomy (to be fashioned as per available instruments, expertise and local disease)

- For obtaining satisfactory three dimensional margins around the primary tumor.
- When the primary tumor approximates the mandible
- Minimal erosion of the alveolar process of the bone

During marginal mandibulectomy, avoid sharp angle and perform smooth rounded resections.

#### Indications for segmental mandibulectomy

- Gross invasion by tumor
- Proximity of oral commissure to the mandible in a previously irradiated patient
- Invasion of inferior alveolar nerve or canal by cancer
- Massive soft tissue disease adjacent to the mandible

#### Reconstruction Procedures

- **Mucosal defects**  
Small defect: local flap /SSG/ leave raw  
Large defect – Free flap/ pedicled flap (PMMC – Pectoralis Major Myo Cutaneous flap)
- **Skeletal defect**  
Free fibula/ cadaveric bone graft/ silastic/ plate.
- **Skin defect**  
Local flap/ free flap/ deltropectoral flap/forehead flap/PMMC

#### Post operative radiation +/- CT

This is part of the planned treatment in locally advanced disease. Minimum dose should be 60 Gy in 1.8-2Gy per fraction. Uninvolved lower neck should be treated with a minimum dose of 50Gy. The dose should be escalated to 66Gy in high risk areas.

### **Adjuvant chemo radiation (CT+RT)**

This is to be offered to all patients with multiple node positive disease, extra capsular spread or margin positive disease.

#### **7.2.2 Concurrent CT+RT**

CT + RT is considered only for medically inoperable cases or if patients are not willing for surgery. Performance status of the patient should be considered before deciding on concurrent chemo RT. The following principles are to be noted:

1. The drug of choice for concurrent chemotherapy is single agent cisplatin. The recommended dose is cisplatin 30 mg/m<sup>2</sup> weekly. Minimum cumulative dose needs to be 200 mg/m<sup>2</sup>. Alternately cisplatin at a dose of 100 mg/m<sup>2</sup> every three weekly during the course of radiotherapy is given (ideally chemotherapy is to be administered on days 1, 22 & 43 of radiotherapy). Other drugs that are used include carboplatin and paclitaxel.
2. Complete blood count, biochemistry etc should be done prior to each dose of chemotherapy.
3. In patients who are not candidates for cisplatin, carboplatin and paclitaxel is the regime of choice for chemoradiation.
4. Monoclonal antibody therapy directed against EGFR (cetuximab and nimotuzumab) added to radiation therapy improves outcome, however, there is no evidence in the Indian literature and cost benefit ratio may be considered before taking a decision.
5. Feeding through nasogastric tube, gastrostomy or jejunostomy is strongly recommended during chemoradiation.
6. If there is poor tolerance to the planned concurrent chemoradiation programme, chemotherapy should be withheld while radiotherapy is continued to the specified dose.

#### **7.2.3 Altered Fractionation Schedules**

This is a valid option for patients who are not candidates for surgery or are unsuitable for chemo radiation<sup>55</sup>.

#### **7.2.4 Induction Chemotherapy**

For borderline inoperable disease, chemotherapy may be considered to facilitate better resection. Based on recent evidences in the literature, CDDP+5FU + Taxanes is considered the most effective neoadjuvant regimen.

Alternative chemotherapy schedule is Cisplatin + 5-Fluorouracil. Both chemotherapy regimens have level 1 evidence in terms of their efficacy in neoadjuvant setting in head & neck cancers.

Resectability subsequent to induction chemotherapy is best assessed by clinical evaluation and imaging where indicated. CT or MRI scan (if available) may be used for assessment of disease in inaccessible areas such as pterygopalatine fossa or infratemporal fossa. It is also preferable that the pre and post chemotherapy assessments are performed by the same group of oncologists. Patients who have progressive disease after 3-4 cycles of induction chemotherapy should be considered for palliative treatment only.

### **7.3 ADVANCED STAGE IV B & IV C (BOTH ESSENTIAL)**

- Intention of treatment is only palliation with maintenance of quality of life.
- Indications for treatment:

- Extensive skin involvement with or without cutaneous nodules
- Temporal fossa involvement clinically
- Hard fixed N3 disease.
- Symptomatic systemic disease.

### Options

- (i) Radiotherapy
- (ii) Chemotherapy

#### 7.3.1 Radiotherapy

If the primary +/- nodal disease is symptomatic, consider palliative EBRT. Doses of 30Gy/10fr or weekly XRT 7-8Gy/fr / wk for 2-3 wks may be employed.

#### 7.3.2 Chemotherapy

Systemic disease or progressive local disease after RT could be treated with chemotherapy.

#### *Agents Used:*

- |                              |                                  |
|------------------------------|----------------------------------|
| 1. Single agent Methotrexate | 2. Single agent Cisplatin (CDDP) |
| 3. CDDP + 5-Fluorouracil     | 4. CDDP + Docetaxel              |
| 5. CDDP + Paclitaxel         | 6. CDDP + Cetuximab              |

#### *Ideal*

Targeted therapy along with radiotherapy and chemotherapy as mentioned above

### 7.4 RECURRENT DISEASE

- ◆ Treatment decisions for recurrent disease should be based on:
  - Site of recurrence: Primary (Buccal Mucosa alone)/ Invasion of adjacent structures/ nodes
  - Performance Status of the patient
  - Interval between the primary treatment and recurrence
  - Resectability of the recurrence
  - Prior treatment with radiotherapy or not.

#### **Principles of treatment of recurrent disease:**

- ◆ If recurrence is small, revision surgery or radiotherapy are the treatment options.
  - If recurrence is operable and patient is radiotherapy naïve → Surgery + PORT ± chemotherapy or  
Radical radiotherapy alone (lesion is rT1N0 or rT2N0)
  - If surgery is not medically feasible or patient is not willing, radiotherapy naïve and good performance status → Concurrent CT+RT or radiotherapy alone to be considered.
- ◆ If surgery is not feasible, and poor performance status the treatment should be individualized employing appropriate measures such as:
  - If Radiotherapy naïve: Palliative radiotherapy - 30 Gy/10Fr or weekly RT 7-8 Gy/2-3fr.
  - Palliative chemotherapy (as for stage IV B & IV C disease)
  - Best supportive care

**8.1 T1N0 (≤2cm) (All Essential)**

- Wide local excision alone if operated per orally for low grade less than 4 mm thick disease  
or
- Wide local excision plus ± Ipsilateral SOHND if approached externally  
or
- Interstitial brachytherapy alone using after loading techniques (LDR/HDR)  
or
- Radical EBRT alone.

**8.2 T2N0 (All Essential)**

- Wide Local Excision + Ipsilateral SOHND  
or
- Radical EBRT alone  
or
- EBRT + Brachytherapy boost

**8.3 T1, 2, N1 Disease (All Essential)**

- T1, N+: Treatment of the primary as described above.  
Treatment of the neck depending upon the nodal staging
- T2, N+: Treatment of the primary as described above for T2  
Treatment of the neck depending upon the nodal staging
- Wide Local Excision (WLE) + Ipsilateral neck dissection ± Reconstruction  
or
- (data is limited) Whole neck has to be addressed

**8.4 T3N0, T3N1, T1N2, T2N2, T3N2, T4aN0 : Combined Modality****Treatment (All Essential)**

- Surgery (Wide Excision (WE) + Ipsilateral neck dissection ± Reconstruction + PORT (Dose 60Gy) or Postoperative chemoradiation (Dose 66 Gy) for
  - a) Multiple node positive disease
  - b) Extracapsular Spread

- Concurrent CT+RT
- Radiotherapy to a total dose of 70 Gy along with single agent Cisplatin at 30 mg/m<sup>2</sup> iv weekly or 100mg/m<sup>2</sup> iv at three weekly
- Induction chemotherapy may be offered to select patients to enhance resectability.
- Altered fractionation schedules for patients not suitable for surgery and CT+RT

### 8.5 T4b, N3, M1: PALLIATIVE TREATMENT (ALL ESSENTIAL)

Radiotherapy or Chemotherapy

#### Ideal

Targeted therapy along with radiotherapy and chemotherapy mentioned above

#### Monitoring during radiotherapy and treatment of side effects of radiation

- ◆ Patients undergoing radiotherapy should be monitored closely to monitor the acute effects and maintain nutrition. Weekly assessments to ensure:
  - Proper dental and oral hygiene
  - Adequate nutrition and hydration
  - Assessment for any focus of infection
  - Adequate analgesia
  - Thorough evaluation of mucositis and skin reactions

- **Proper dental and oral hygiene**

Proper evaluation of oral cavity as well as teeth before, during and after radiation should be performed. Dentition in poor condition should be identified and considered for extraction to minimize the subsequent risk of osteonecrosis. Specifically, those teeth that reside within the high dose radiation volume or any showing significant periodontal disease, impacted teeth, unopposed teeth and teeth that could potentially oppose a segment of a resected jaw bone, should be considered for extraction. Advanced caries, abscess formation or teeth otherwise in a state of disrepair should be extracted. A special fluoride treatment before starting radiotherapy may help to prevent tooth decay.

- **Management of radiation effects**

- ◆ **Acute mucositis**

Acute mucositis should be treated symptomatically. In addition to providing good pain management patients should be advised to maintain good oral hygiene and use frequent mouth gargles with baking soda (1 teaspoon dissolved in quart of water) at least 5 -6 times a day to minimize secondary infection. All patients require pain management to get through the period of acute radiation reaction.

- ◆ **Skin reactions**

With megavoltage therapy, skin care generally consists of prevention of local irritation by encouraging the use of soft clothing and avoiding sunlight exposure. Patients must be encouraged to take adequate nutrition and fluids. Ryle's tube feeding or percutaneous endoscopic gastrostomy should be advised if necessary.

Patients need considerable moral support and reassurance from the treatment staff. They should be advised to abstain from smoking and alcoholic beverages.

#### Rehabilitation

- Abstinence from tobacco and alcohol
- Oral hygiene

- Dental prophylaxis
- Shoulder therapy
- Jaw stretching exercises
- Swallowing and speech rehabilitation

#### **Follow up**

- To assess the recurrence in primary and nodal areas
- To rule out any second primary
- To assess any complication due to surgery/ radiotherapy
- Schedule of Follow Up

Every 2-3 months for first 2 years

Six monthly for next 3 years. Thereafter annually. Clinical examination including history and physical examination and appropriate investigations on follow up.

\* **Desirable/Ideal** : Tests and treatment that may not be available at all centres but the centres should aspire to have them in near future.

\* **Essential** : Bare minimum that should be offered to all the patients by the centres treating patients with care.

## Consensus Statement on Practice

Stage (TNM)	Initial treatment planning	Histopathology report	Post histopath report treatment	Special considerations
T1,N0M0	Surgery or RT (EBRT+Brachytherapy Boost)	pT1 and no risk factors	Nil	USG is preferred method for N0
		Positive margins	PORT	Re excision also can be preferred in eligible patients
T2N0M0	Surgery (primary+SOHND) or RT(EBRT+Brachy boost)	pT2, pN0M0	Nil	
		pT3,pT4 or neck +ve or ECS, PNI	CT+RT or RT	CT+RT preferred when multiple nodes positive or N2/N3, ECS, +ve margins
T3,T4a, N1,N2M0	Surgery followed by CT-RT (or RT) OR Radical CT+RT	ECS or positive margins	CT+RT preferred over RT as adjuvant treatment	Altered fractionation RT also is an option at specialized centers
T3, T4, N1, N2, M0-borderline resectable	Induction chemotherapy followed by surgery or CT+RT	N/A	N/A	Induction chemotherapy data is limited
T4b or N3 (fixed node)	Palliative intent chemotherapy or RT	N/A	N/A	Multiagent chemotherapy preferred if Performance status of patient is good.
Recurrent disease < 6 months old	CT+RT if patient had undergone surgery earlier and surgery if CT+RT earlier			Poor prognosis patients
	Surgery if resectable	Same as primary treatment		
Recurrent disease >6months after initial treatment	CT+RT if unresectable and RT naïve			
Recurrent disease-advanced	Palliative chemotherapy or best supportive care	N/A	N/A	N/A

1. Carcinoma Buccal Mucosa among young individuals
2. Molecular and genetic diagnosis
3. Role of chemotherapy in the neo adjuvant setting
4. Role of new techniques for diagnosis and management like PET-CT and IMRT
5. Role of targeted therapies



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