

GINGIVOBUCCAL CANCER: AN INSTITUTIONAL EXPERIENCE OF 100 PATIENTSMahesh Bhat¹, Vinay V. Rao², Caren D'souza³, Anita Aramani⁴, Rahul Shivaraj⁵**HOW TO CITE THIS ARTICLE:**

Mahesh Bhat, Vinay V. Rao, Caren D'souza, Anita Aramani, Rahul Shivaraj. "Gingivobuccal Cancer: An Institutional Experience of 100 Patients". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 48, September 29; Page: 11578-11584, DOI: 10.14260/jemds/2014/3516

ABSTRACT: INTRODUCTION: India has the largest number of gingivobuccal complex tumor hence aptly called as the "Indian Cancer". Smokeless tobacco consumption across the country being the principle cause for this high prevalence. **OBJECTIVE:** High prevalence and lack of general awareness among the physicians and patients regarding good prognosis of early lesion prompted us to undertake this study to briefly delineate presentation and management guideline. **MATERIALS AND METHODS:** Prospective study of 100 patients visiting the outpatient department of Father Muller Medical College, Mangalore who were established cases of oral cavity cancer with primary involvement of gingivobuccal complex. Detailed history and workup was done and appropriately staged. Treatment protocol was drawn according to the stage of the disease. **RESULTS:** total of 100 patients were included in the study. Common presentations were of ulcerative mass in the oral cavity and foreign body sensation. Most of the lesions involved either upper or lower gingivobuccal sulcus; bone erosion was not always an associated feature. Nodal metastasis was infrequent. **CONCLUSION:** Treatment can be customized to the patient needs as it has enough room for flexibility. A thorough knowledge about the pathophysiology and spread of the disease is mandatory and a team approach is always better than individual heroics.

KEYWORDS: Gingivobuccal complex tumors, gingivobuccal sulcus.

INTRODUCTION: Oral cancer is the 10th most common cancer with approximately 400,000 cases getting added to the existing burden. In the Asian subcontinent, India accounts for a sizeable chunk of head and neck cancer and gingivobuccal complex disease being the most common sub site here hence aptly called as the "Indian Cancer". The widespread use of smokeless tobacco consumption is the main etiological factor which is quite prevalent in the northern states of Uttar Pradesh, Bihar and Gujrat. Various legislations have been initiated to curb this social menace and an attempt is being made to bring about a change in recent days.^(1,2)

In our Centre we undertook a prospective study to see the pattern of presentation of gingivobuccal complex cancer, local destruction, neck and distant metastasis and the treatment offered depending on the disease spread. We have made an attempt to lay out a comprehensive treatment guideline depending upon the variations in presentation as it may provide as a useful guide in decision making.

MATERIALS AND METHODS: Prospective study of 100 patients visiting the outpatient department of Father Muller Medical College, Mangalore who were established cases of oral cavity cancer with primary involvement of gingivobuccal complex. Apart from taking a detailed history these patients were examined for local presentation and spread of the disease like skin and mandibular involvement. Cervical and distant metastasis was looked for.

ORIGINAL ARTICLE

After initial workup all the cases were discussed in tumor board meeting which comprised of the treating surgeon, medical and radiation oncologist. Treatment plans were drawn based on the disease and necessary consent obtained for further treatment course.

RESULTS:

Foreign body sensation	73
Increased salivation	23
Ulcer	82
Pain or burning sensation	44
Trismus	41
Dysphagia or odynophagia	53
Neck swelling	5

Table 1: Symptoms of GB complex disease

Buccal mucosa	21	
Upper or lower GBS	12	
BM extending into upper/lower GBS	38	
BM with upper and lower GBS	29	
Mandibular involvement	Horizontal ramus	28
	Vertical ramus/RMT	14
	Both	6
Upper alveolus/ maxilla involvement	23	
Pterygoid plate erosion	13	
Pterygoid fossa involvement	7	
Infratemporal fossa	5	
Masticatory space	Low	22
	High	9
Skin involvement	33	
Extending into adjacent subsite	7	
Intracranial/ skull base involvement	3	

Table 2: Local extent of GB complex disease (data is based on final assessment after appropriate radiological investigations)

Nodal metastasis at presentation	44%	
First nodal station	Level I	86%
	other	14%
Presence of distant metastasis	10%	

Table 3: Pattern of nodal and distant metastasis

DISCUSSION: In most of the literature published, tongue is mentioned as the most common sub site affected in oral cavity cancer (67%). Recent epidemiological studies have established that this is not

ORIGINAL ARTICLE

the case in India where the gingivobuccal (GB complex) complex disease are the commonest (58%) hence, aptly called the “Indian Cancer”. Tobacco is consumed in various forms across the country the common forms being pan, beeda, mawa, mishri, etc.

Of these few are mixed with lime and kept in the GBS or applied as a paste over the gums or chewed, whichever might the way of consumption it is most often placed in the anatomical confines of the buccal cavity hence local changes are more evident there.⁽¹⁾ 2/3rd of the cases are found in developing countries and to this 400,000 new cases get added annually and approximately 200,000 deaths reported every year. In recent international comparison study to see the number of affected individuals per 100,000 population it was found that few cities in India like Bhopal and Chennai were more than the national average of countries like UK and Italy.^(1,3) This highlights the grim picture that we face today.

Most of the patients included in our study had history of tobacco consumption in one way or the other but few actually attributed their disease to substance abuse and most of them refused to accept tobacco consumption as an etiological factor. Many even considered tobacco consumption as a social symbol of male chauvinism as in some parts of North India smoking hooka is ceremonious with social status which is often emulated by urban teenagers in pubs and bars.

In our study the sex ratio was not as similar as other sub sites in oral cavity, female population had greater incidence. This is understandable as in our country women consume smokeless tobacco as commonly as men with high prevalence in rural population. The common presenting symptom was frank ulcerative lesion in the mouth and foreign body sensation in mouth. They often accompanied with pain, which was not associated with the size of the lesion. Patients with bigger ulcer proliferative lesions with mandibular invasion were more worried about the shear presentation than anything else.

In most of the studies associated oral sub mucosal fibrosis is more troublesome than the lesion per se and tumor is incidentally detected in these group of patients.⁽⁴⁾ Pain and trismus were the second most common complaint, which can be present because of the lesion proper on sub mucosal fibrosis, these patients would usually complain of burning sensation and poor tolerance to spicy food. In advanced lesions due to involvement of medial pterygoid and/or temporalis muscle one can have severe trismus with deep seated retro mandibular and temporal pain? Difficulty in swallowing was usually found secondary to depressive mental state and poor general condition.

All the cases were thoroughly evaluated. Apart from routine hematological tests, chest x ray was asked. All the patients underwent contrast enhanced computerized topographic scan (CECT) of head and neck region. CECT is a gold standard radiological investigation for assessment of GBS tumors: mandibular invasion can best be demonstrated (especially early bone involvement), masticator space involvement (low and high), pterygoid muscle involvement, pterygoid plate and skull base involvement are well appreciated. Cervical nodal metastasis, carotid involvement and prevertebral fascia spread are added advantages.^(3,5)

“Puffed cheek technique” is a radiological tool employed in buccal mucosa tumor imaging where the patient is asked to blow his cheek and hold it during scanning, by doing so the vestibule is stretched apart and GBS is well delineated and over assessment of lesion is avoided. Sometimes it can be combined with magnetic resonance imaging (MRI) which can be helpful in knowing soft tissue extension and early periosteal invasion of mandible. Positron emission tomography (PET) scan is finding many uses in early detection of recurrences, treatment failures and distant spread.^(2,3)

ORIGINAL ARTICLE

Wherever warranted the appropriate radiological investigations were done in all our patients to map and stage the disease. In our cases there was no site predilection, wherever the patient was habitually keeping the quid that site was commonly involved. Most of the lesions were found principally on the buccal mucosa and extending to either upper or lower GBS. Different site involvement is described in table 2.

44% of our patients had nodal metastasis at presentation out of which 86% had sentinel node involvement (table 3). As seen in various studies nodal metastasis is not a presenting feature in GBS complex tumors unlike tumors of tongue where an innocuous looking primary can present with nodal metastasis. This can be due to poor vascularity and tough tissue planes.

Sentinel node biopsy has a special place in buccal mucosa tumors as studies have shown that dissecting the first echelon node to detect tumor spread in buccal mucosa lesions is highly beneficial as a negative node is strongly suggestive of no nodal spread and such patients after appropriate surgery do very well unlike patients with tongue tumors where there could be occult metastasis or distant spread at presentation^(5,6) Nodal metastasis has a very reciprocal relation with survival, greater the nodal involvement lesser the survival.^(1,3) All the patients were staged according to AJCC, 2010 7th edition tumor staging system as mentioned below.⁽¹⁾

TNM Staging (AJCC, 2010)

PRIMARY TUMOR:

- TX Primary tumor cannot be assessed.
- T0 There is no evidence of primary tumor.
- Tis Carcinoma is in situ.
- T1 Tumor is 2 cm or less in greatest dimension.
- T2 Tumor is more than 2 cm but not greater than 4 cm in greatest dimension.
- T3 Tumor is more than 4 cm in greatest dimension.
- T4 Moderately advanced local disease. (Lip) Tumor invades through cortical bone, inferior alveolar nerve, floor of mouth, or skin of face, i.e., chin or nose (Oral cavity) Tumor invades adjacent structures only (e.g., through cortical bone,[mandible or maxilla] into deep [extrinsic] muscle of tongue [Genioglossus, hyoglossus, palatoglossus, and styloglossus, maxillary sinus, skin of face)
- T4b Very advanced local disease. Tumor invades masticator space, pterygoid plates, or skull base and/or encases internal carotid artery, skull base and/or encases the internal carotid artery.

REGIONAL LYMPH NODES:

- Nx Regional LN cannot be assessed
- N0 No regional LN metastasis
- N1 Ipsilateral Single node < 3cm
- N2a Ipsilateral Single node 3-6cm²⁷
- N2b Ipsilateral multiple nodes <6cm
- N2c Bilateral/Contralateral nodes<6cm
- N3 Lymph node > 6cm

METASTASIS:

M0 No metastasis

M1 Distant metastasis

After assessing the exact spread of the disease all the cases should be ideally discussed by a team comprising of surgical, radiation and medical oncologist, which we did and a broad treatment guideline was framed (table 4). Stage I & II tumors which were confined to one sub site with no local or nodal spread were managed by a single modality of treatment which in our case most of the times was surgery.

Patients who could not undergo surgery due various other reasons like poor general condition, unwilling for surgery, etc. were sent for radiotherapy. Various reasons have been postulated for nodal metastasis, one of them being tumor thickness; it is found that any tumor having thickness more than 4 mm has greater propensity to metastasize as it'd invade deeper tissue plane and infiltrate facial lymphatics.^(6,7) The incidence varies with site. Similar observations were made in our study as well, early lesions were less infiltrative than advanced lesions and nodal spread as such is uncommon in early GBS lesions hence these patients did very well with surgery alone.

T1, T2 N0 M0 – Stage I & II	Wide local excision with selective neck dissection
T3, T4 N0, N+ M0- Stage III & Iva	Composite resection with MRND with appropriate reconstruction and Adj CTRT
Stage IVb (pterygoid plate/fossa involvement, low masticatory space involvement)	Composite resection with ND with PMMC flap reconstruction and Adj CTRT
High masticatory space involvement, low ITF involvement, N2-N3 nodal disease with no distant metastasis	NACT- 2 cycles and then assesses response: if disease is shrinking then plan 3 rd cycle and proceed with definitive surgery with Adj CTRT. If no disease is unresponsive then plan surgery after 2 nd cycle.
T4c or distant metastasis	Palliative care

Table 4: Staging and treatment protocols

Stage III & IVa cases were locally advanced but resectable tumors. Most of them had either mandibular or skin involvement or both. All of these cases underwent modified radical neck dissection. There is a general confusion regarding management of lesions involving the masticator space, according to AJCC staging such tumors are classified as T4b hence may or may not be operable.

Recent studies have shown that type of lesions can again be sub classified as low and high masticatory space involvement, the plane of separation being the zygoma. Any lesion invading the masticatory space up to the level of zygomatic arch is termed as low space involvement and hence operable upfront and anything above this would require neoadjuvant chemotherapy of 2 cycles of cisplatin and 5 fluorouracil 3 weeks apart after which depending upon response surgery or 3rd cycle can be planned.

Newer taxanes such as paclitaxel and docitaxel are finding place in this regimen.^(8,9) 5 year survival with advanced lesions can anywhere be between 30% to 40%. Stage IVb and IVc tumors require palliative care and pain management.^(2,7)

ORIGINAL ARTICLE

All stage III and IV cases would require adjuvant chemo-radiotherapy, 65-70 Gy units in 32-35 fractions over 6-7 weeks, radical radiation dose of 60-66 Gy units to neck. Few studies have suggested a radiation boost to the primary site helps in controlling primary recurrence however it is not practiced worldwide.^(8,10)

CONCLUSION: GBS complex tumors are the commonest in our country and we have tried to present a comprehensive study and a brief guideline as to how to manage this. GBS tumors though look destructive with aggressive presentation they are relatively non-aggressive tumors with good prognosis. 5 year survival as compared to many other sub sites is much better. Treatment can be customized to the patient needs as it has enough room for flexibility. This patient group should be affectively targeted as early and proper intervention can be crucial in favorable outcome. A thorough knowledge about the pathophysiology and spread of the disease is mandatory and a team approach is always better than individual heroics.



Fig. 1: Buccal mucosa lesion involving the lower gingivobuccal sulcus

REFERENCES:

1. Joshi P, Nair S, Chaturvedi P, Nair D, Agarwal JP, D'Cruz AK. Delay in seeking specialized care for oral cancers: Experience from a tertiary cancer Centre. *Indian J Cancer*. 2014 Apr-Jun; 51 (2): 95-7.
2. Misra S, Chaturvedi A, Misra NC. Management of gingivobuccal complex cancer. *Ann R Coll Surg Engl*. 2008 Oct; 90 (7): 546-53.
3. Diaz EM Jr, Holsinger FC, Zuniga ER, et al. Squamous cell carcinoma of the buccal mucosa: one institution's experience with 119 previously untreated patients. *Head Neck* 2003; 25: 267-273.
4. Tilakaratne WM, Klinikowski MF, Takashi S. Oral sub mucous fibrosis: review on etiology and pathogenesis. *Oral Oncol* 2006; 42:561-568.
5. Narendra H, Tankshali RA. Prevalence and pattern of nodal metastasis in pT4 gingivobuccal cancers and its implications for treatment. *Indian J Cancer*. 2010 Jul-Sep; 47 (3): 328-31.
6. Murti PR, Bhonsle RB, Pindborg JJ. Malignant transformation rate in oral sub mucous fibrosis over a 17 year period. *Community Dent Oral Epidemiol* 1997; 25: 377-383.

ORIGINAL ARTICLE

7. More Y¹, Sharma S, Chaturvedi P, D'Cruz AK. Gingivobuccal mucosal cancers: resection to reconstruction. *Curr Opin Otolaryngol Head Neck Surg*. 2014 Apr; 22 (2): 95-100.
8. Silverman S, Bhargava K, Smith LW, Malaowalla AM. Malignant transformation and natural history of oral leukoplakia in 57 518 industrial workers of Gujarat, India. *Cancer* 1976; 38:1790–1795.
9. Kowalski LP¹, Sanabria A. Elective neck dissection in oral carcinoma: a critical review of the evidence. *Acta Otorhinolaryngol Ital*. 2007 Jun; 27 (3): 113-7.
10. Elsheikh MN¹, Rinaldo A, Ferlito A, Fagan JJ, Suárez C, Lowry J, Paleri V, Khafif A, Olofsson J. Elective supraomohyoid neck dissection for oral cavity squamous cell carcinoma: is dissection of sublevel IIB necessary? *Oral Oncol*. 2008 Mar; 44 (3): 216-9.

AUTHORS:

1. Mahesh Bhat
2. Vinay V. Rao
3. Caren D'souza
4. Anita Aramani
5. Rahul Shivaraj

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of ENT, Father Muller Medical College, Mangalore.
2. Assistant Professor, Department of ENT, Father Muller Medical College, Mangalore.
3. Associate Professor, Department of General Surgery, Father Muller Medical College, Mangalore.
4. Senior Resident, Department of ENT, Father Muller Medical College, Mangalore.

5. Post Graduate, Department of ENT, Father Muller Medical College, Mangalore.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vinay V. Rao,
Assistant Professor,
Department of ENT,
Father Muller College,
Kankanady, Mangalore-575002.
Email: drinayvrao@gmail.com

Date of Submission: 19/09/2014.
Date of Peer Review: 20/09/2014.
Date of Acceptance: 22/09/2014.
Date of Publishing: 27/09/2014.