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Original Research Article

Indian cancer: Our experience with review of literature

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Abstract

Introduction: Gingivobuccal (GB) complex disease is the most common subsite involved in India hence aptly called as the "Indian Cancer". The widespread use of smokeless tobacco consumption is the main etiological factor. We undertook a study to see the pattern of presentation, evaluation and the treatment offered depending on the disease spread.

Materials and methods: Prospective study of 100 patients visiting the outpatient department of Father Muller Medical College, Mangalore suffering from oral cavity cancer with primary involvement of GB complex.

Results: The main complaint was presence of an ulcerative lesion followed by foreign body sensation and pain. Lower GB sulcus with involvement of horizontal ramus was commonest presentation. Upfront nodal metastasis was not common.

Discussion: GB complex disease has a much greater incidence in women unlike subsites. It's a disease with better prognosis than other subsites hence; early tumors can be effectively managed. Detailed tumor staging and comprehensive disease management protocol has been postulated.

Conclusion: Proper staging of the disease with good surgical resection ensures better survival. Team work is the key to good outcome.

Keywords: Gingivobuccal complex tumors, cancer

1.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 subsite 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 layout a comprehensive treatment guideline depending upon the variations in presentation as it may provide as a useful guide in decision making.

2. 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 metastases were looked for. 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.

3. Results

Table 1: Symptoms of GB complex disease

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

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

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 3: Pattern of nodal and distant metastasis

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

4. Discussion

In most of the literature published, tongue is mentioned as the most common subsite affected in oral cavity cancer (67%). Recent epidemiological studies have established that this is not 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 ulceroproliferative lesions with mandibular invasion were more worried about the shear presentation than anything else. In most of the studies associated oral submucosal fibrosis is more troublesome than the lesion per se and tumor is incidentally detected in these groups of patients[4]. Pain and trismus was the second most common complaint, which can be present because of the lesion proper on submucosal 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 retromandibular 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 haematological tests, chest x ray was asked. All the patients underwent contrast enhanced computerised 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 check 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]. 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 subsite 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 metastasise 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.

Table 4: Staging and treatment protocols

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 assess response: if disease is shrinking then plan 3rd cycle and proceed with definitive surgery with Adj CTRT. If no disease is unresponsive then plan surgery after 2nd cycle.
T4c or distant metastasis	Palliative care

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 flourouracil 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].

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].

5. 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. Treatment can be customised 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.

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

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