



"A PROSPECTIVE AND COMPARATIVE STUDY OF CARCINOMA OF BUCCAL MUCOSA CASES WITH EXCISION FOLLOWED BY PRIMARY CLOSURE VERSUS USE OF RECONSTRUCTIVE FLAP"

Surgery

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ABSTRACT

Introduction: Carcinoma of buccal mucosa is the most common cancer of the oral cavity in India.¹ Increasing trend of incidence of these cancers in the developing countries, most likely due to a higher exposure to alcohol, tobacco, health ignorance, poor access to health care facilities. Buccal mucosa cancers primarily occurs along the occlusal plane and are characterized by pain and ulceration, which are usually accompanied by a buccal mass. **Aim:** To compare the clinical outcome in cases of surgery with primary closure and surgery with reconstructive flaps after standard surgery for extirpation of tumor. **Material And Method:** The study was carried out as a prospective study in the Department of General Surgery at Gajra Raja Medical College and J.A. Group of Hospitals, Gwalior (M.P.) for one and half year from January 2020 to June 2021. A total of 30 patients with histopathologically confirmed carcinoma of buccal mucosa were studied. The study was approved by ethical committee of the Hospital. **Results:** In the present study, the result of primary closure vs flap reconstruction for defects extirpation of tumor, the maximum cases lie in age group of 41-50 years (12 i.e. 40%) age group of 61-70 years (6 i.e. 20%) and 51-60 years (5 i.e. 17%). Carcinoma of buccal mucosa had higher incidence in male. Total number of male cases were 26(87%) and female cases were 4(13%). The male to female ratio was 6.5:1. Out of 30 patients, in 18 cases neck management done by modified radical neck dissection and in 11 cases neck managed by radical neck dissection. After resection of primary lesion and neck dissection, the defect which was either covered by use of reconstructive flap or primary closed. Out of 30 cases, in 18 cases defect was closed by use of reconstructive flap and in 12 cases defect was primary closed. Out of 30 cases, in 13 cases(72%) reconstruction was done by use of pectoralis major myocutaneous flap. In 3 cases(17%), reconstruction was done by use of free fibular graft and in 2 cases(11%), reconstruction was done by use of Radial forearm free flap. **Conclusion:** In carcinoma buccal mucosa, No neck patients was treated with modified radical neck dissection and N+ neck patients was treated by Radical neck dissection. Eleven carcinoma buccal mucosa underwent Radical neck dissection and 18 patients had Modified radical neck dissection. For Mandible reconstruction, fibular bone graft is best option for form and function. Two patients underwent mandibular reconstruction by use vascularized fibular bone. Primary closure of defect was possible if surrounding tissue was lax. Primary closure after excision of tumor done in 12 cases(40%). In buccal mucosa carcinoma, free flap provides reconstruction for complex defect. In present study, Pectoralis major myocutaneous flap mostly used for reconstruction of defect. In 13 patients (72%) PMMC flap was used. The complication noted was, immediate was flap necrosis and late was recurrence. In immediate post operative period there was flap necrosis in 2 cases and recurrence was seen in 4 cases.

KEYWORDS

Carcinoma buccal mucosa, primary closure, reconstructive flap, PMMC flap, Radial forearm free flap, Free fibular graft, Squamous cell carcinoma(SCC).

INTRODUCTION:

Carcinoma of buccal mucosa is the most common cancer of the oral cavity in India.¹ Increasing trend of incidence of these cancers in devolving countries, most likely due to a higher exposure to alcohol, tobacco, health ignorance, poor access to health care facilities. Buccal mucosa cancers primarily occurs along the occlusal plane and is characterized by pain and ulceration, which are usually accompanied by a buccal mass. Squamous cell carcinoma of buccal mucosa is rare and accounts for approximately 10% of all oral cancers. The buccal mucosa was reported to be the fourth most common site following the mandible, tongue and maxilla.²⁻³ Buccal mucosa SCC is known to grow more rapidly and penetrate well with a higher recurrence rate than oral SCC at other sites. Buccal mucosa cancers can invade adjacent structures such as upper and lower jaws, masticatory muscles and cheeks, often rendering surgical resection and reconstruction more challenging, particularly when the cancer invades the masticator space.⁶ Mostly Ca buccal mucosa spread to neck lymph node. Then different procedures are recommended, partial or selective neck dissection, modified radical neck dissection and Radical neck dissection.⁷ When tumor has grown into the jaw bone, mandibular resection or mandibulectomy, may be needed. In this procedure, all or part of jaw bone is removed. Closure of defect either by flap or primary closure decided after resection of tumor. If tumor is large size and involvement of mandible then we can plan for-

Marginal mandibulectomy can be done when tumor size small, involve the periosteum, not invade the cortex.

Segmental mandibulectomy can be done when tumor involve the coetex >0.05cm near to midline.

Hemimandibulectomy can be done when tumor involve away from midline and complete involvement of cortex present.

Preoperative tracheostomy done to secure patient airway during surgery and after surgery in most of the cases. Reconstructive surgery following resection for oral cancer is considered when there is functional or aesthetic loss of structures in the oral cavity. Thus loss of a significant part of the tongue, floor of mouth or buccal mucosa and loss of a segment of the mandible following resection of primary tumor would be indicators of reconstructive surgery. Superficial surgical defects of the mucosa and underlying soft tissues can be adequately reconstructed using simply a split thickness skin graft. On the other hand, larger defects of the tongue exceeding one half of the tongue or large surface areas of the floor of the mouth, gum and buccal mucosa require free tissue transfer. A radial forearm free flap provides excellent tissue for resurfacing mucosal defects and underlying soft tissue deficiencies. The Radial forearm free flap is also an excellent choice for reconstruction of any substantial resection of tongue.⁸ Fibular free flap reconstruction is currently the choice of reconstruction for defects following segmental mandibulectomy in any part of mandible. While other free flaps are available, the fibula provides the maximum length and bone stock to achieve a satisfactory reconstruction of the lower jaw.⁹ Other free flap available for mandible reconstruction are those from the iliac crest, scapula and radial forearm osteocutaneous flap. The descending circumflex iliac artery flap provides bone as well as soft tissue and skin for reconstruction of composite defects of mandible. Similarly the scapula free flap provides separate components of bone, muscle and skin on the same vascular pedicle in any combination. The choice of a particular free flap depends upon the location and length of mandible reconstruction, as well as the need for soft tissue and mucosal lining or skin coverage at the site of resection.¹⁰ Resection of small parts of the upper gum and palate rarely require major reconstructive surgery. The small defects are easily rehabilitated by a maxillofacial prosthetic devise(dental obturator). On the other, larger defects of the upper gum and hard palate may be considered for immediate reconstruction using an osteocutaneous

free flap from fibula, iliac crest or scapula. In the elderly edentulous patient, repair of the large surgical defect of the upper gum and hard palate can be accomplished with a soft tissue free flap, such as a rectus abdominis or anterolateral thigh flap.¹⁰ Treatment for oral cavity cancers depends on the specific subsite of the tumor and primary tumor staging. It is also necessary to take into consideration the performance status of each patients as treatment is very intense with many side effects. Patients with comorbidities have poor survival, irrespective of choice of the treatment.

AIMS: To compare clinical outcome in cases of surgery with primary closure and surgery with reconstructive flaps.

MATERIAL AND METHODS:

After obtaining approval from ethical committee, the present study "A prospective and comparative study of carcinoma of buccal mucosa cases with excision followed by primary closure of oral cavity versus use of reconstructive flaps" conducted on total 30 patients of oral cavity cancer admitted in Gajra Raja Medical College, Gwalior (M.P.) and J A Group of hospitals Gwalior (M.P.) during January 2020 to June 2021.

Duration of study: One and half year

Criteria for selection: Patients admitted during the study periods in Gajra Raja Medical college and J A Group of Hospitals Gwalior(M.P.) having histopathologically of buccal mucosa.

Exclusion criteria: Patients who are not willing to participate in the study and Patients having malignancies of head and neck other than oral cavity.

In all the patients undergoing study, thorough examination of records was undertaken for patients and a detailed history taking and examination was performed. Treatment modalities chosen and the final outcome of the patient was taken into account. Following points was noted in each of these patients:

1. Demographic data: Age, sex, socioeconomic class, occupation, education
2. History: Presenting symptoms, duration of symptoms, history of alcohol consumption, smoking, gutkha chewing, significant medical history.
3. Examination: General condition, orodental hygiene, tumor location, extent of tumor, palpable lymph node, premalignant lesion.
4. Relevant investigations : Basic blood investigations, imaging wherever applicable in form of CT head and neck and xray of maxilla and mandible bones.
5. Histopathological types of malignancy.

RESULTS:

Table 1 : Age incidence

S.No	Age	No	%
1	21-30	2	7%
2	31-40	4	13%
3	41-50	12	40%
4	51-60	5	17%
5	61-70	6	20%
6	71-80	1	3%

In my study, comparison between carcinoma buccal mucosa followed by primary closure versus use of reconstructive flap. Above table showing maximum cases lie in age group of 41-50 years whose number is 12 (40%) followed by age group of 61-70 years whose number is 6 (20%). Then age group 51-60 years, whose number is 5 (17%).

Table 2 : Sex Incidence

S.No	Sex	No.	%
1	Female	4	13%
2	Male	26	87%

In our study, above table showing carcinoma of buccal mucosa cases has higher incidence in male. Total number of male case is 26 (87%) and female cases is 4 (13%). The male to female ratio is 6.5:1.

Table 3 : Neck Management

S.No	Type	No.
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1	Radical Neck Dissection	11
2	Modified Radical Neck Dissection	18
3	Selective	1
4	No Surgery	0

Table showing after diagnosis of carcinoma mucosa cases, neck management done in our study center, G.R. Medical College which is a tertiary centre. Out of total 30 cases, 18 cases managed by modified radical neck dissection and 11 cases managed by radical neck dissection.

Table 4 : Mandible defect management

Mandible Defect	No	Management	No
hemimandibulectomy	2	Fibular Graft	
Central Segment	0		
Lateral Segment	0		

Table showing 2 cases of carcinoma buccal mucosa has involvement of mandible. So, hemimandibulectomy done and which are managed by taking fibular bone graft.

Table 5 : Reconstruction and primary closure

Title	No	%
Reconstruction	18	60%
Primary Closure	12	40%

The study performed in our G.R. Medical College. After resection of primary lesion and neck dissection. The defect which is created either covered by use of reconstructive flap or primary closed. Out of total 30 cases, in 18 number of cases defect is closed by use of reconstructive flap (60%) and in 12 (40%) cases defect is primary closed.

Table 5 : Reconstruction method

Reconstruction Method	No	%
PMMC Flap	13	72%
Radial Free Flap	2	11%
Free Fibular graft	3	17%

Table showing reconstruction is done by using different flap and graft. Out of total 30 selected cases, in 13 number (72%) of cases reconstruction is done by use of pectoralis major myocutaneous flap. In 3 (17%) cases reconstruction is done by use of free fibular graft and in 2 (11%) case reconstruction is done by use of radial free flap.

DISCUSSION

In this study, the prospectively recorded data of 30 patients admitted to our hospital for oral cavity cancers was analysed in terms of epidemiological factors, clinico-pathological profile and treatment plans.

The discussion of our observation is as following

1. Age Distribution :-

In present study, the maximum cases lie in age group of 41-50 yrs mean age is 50.3 year which was comparable with consolidated report of Hospital based cancer registries from 2007-2011 where they also found most of the patients were in 50-54 years age group.

It was also comparable with the epidemiological statistics conducted by the office for national statistics in which they found for males, age specific incidence rate rises sharply from age 40-44 years, peaks in 60-64 age groups and subsequently drops.

For females age specific incidence rates rise gradually from around age 40-44 years.

Schantz and yu (2002) reported that more than 90% oral cancers occurs in patients older than 45 years and incidence increases steadily until age 65.

Parul Tondon & Anuj the Dadhick, the most predominant age group that was affected by carcinoma buccal mucosa were > 50 years

2. Gender

In our study, there were 26 males (87%) and 4 females (13%) affected by carcinoma of buccal mucosa. Male to female ratio is 6.5:1. It is comparable with study done by Parul Tandon & Anuj Dadhich et al 2017¹¹, out of a total of 321 cases of carcinoma of buccal mucosa 191 (59.5%) were males and 130 (40.4%) were females.

In another study done by Y K chen et al 1999¹², the records 703 cases of oral squamous cell carcinoma collected from 1 January 1985 to 31 December 1996 at a teaching Hospital in southern Taiwan. There was an overwhelming male predominance (male to female ratio = 15:1)

3. Chief Complaints

Out of 30 patients recruited in our study, majority of the patients presented in surgery OPD with chief complaints of ulceroproliferative growth in oral cavity with foreign body sensation and pain being most common symptom.

It was comparable to medical review done by American college of surgeons in which they found possible sign and symptoms included non healing sore in the mouth (most common symptom), refractory pain in mouth, thickening in the cheek, white or red patch on the gums, tongue, difficulty in chewing or swallowing.

4. Treatment

In the present study, all patients received surgical management. Modified radical neck dissection was performed (18 cases) in N 0 neck status patients. Radical neck dissection was performed in N + patients (11 cases). In our study pectoralis major myocutaneous flap was mostly used as reconstructive option for covering the defect. In 13 patients (72%) PMMC flap was done, radial forearm free flap was done in 2 cases (11%) and free fibular graft in 3 cases (17%). This flap reconstruction was done to achieve anatomical and functional rehabilitation. In study performed by Adam MH yough et al 2019³, analysis of data done for 90 consecutive patients with intra oral malignancy requiring immediate soft tissue reconstruction. The majority of patients received an Antero lateral thigh free flap (n=56) with 38% receiving a radial forearm free flap (n=34) Rampukar Chaudhary, md sohain Akhtar et al¹⁴ performed study on total of 62 patients was included among them 59 patients were of malignancy. All the patients of malignancy underwent wide local excision of the tumor with modified radical neck dissection. After resection, the resultant defect was covered with pectoralis major Myocutaneous flap with or without DP flap. It was concluded that PMMC flap is highly versatile and reliable flap with excellent vascularity, wide arc of rotation, large flap dimension and ease of harvesting.

5. Complications

In present study, flap necrosis occurred in 2 cases (6.6%). Recurrence occurred in 4 cases (13.3%) and 15 cases (50%) had wound infection & surgical site infection.

In study done by Mayank Tripathi, Sanjeev Parshad et al¹⁵ 100 PMMC flap at a tertiary care hospital from 2006 to 2013 were performed. PMMC flap was used to cover mucosal defect in 84 patients, skin defects in 10 patients both in 6 patients. Overall flap related complications were 40% with a major complication in 10% and minor complication in 30%. In another study done by Venkatesh Anchosur, Punit S.¹⁶, date of 150 patients who underwent pectoralis myocutaneous flap reconstruction from 2008 to 2016, it was found that the most common complication was wound dehiscence, which was seen in 25 patients (16%), followed by partial skin margin necrosis, which was seen in a maximum of 12 each (8%), hematoma formation in 5 (3%).

CONCLUSION

Oral cavity malignancy occurs mainly in sixth or seventh decade.

In our study, carcinoma buccal mucosa has maximum 40% incidence in 41-50 years age groups. 20% incidence in 61-70 years age group and 17% incidence in 51-60 years of age group.

Carcinoma of buccal mucosa has higher incidence in male. Higher incidence in male (87%) than female (13%). Male to female ratio is 6.5:1.

The use of smokeless tobacco with betel nut is the main predisposing factor for increased incidence buccal mucosa carcinoma.

In carcinoma buccal mucosa, No neck patients can be treated with modified radical neck dissection or radiotherapy. N+ neck patients are treated with radical neck dissection ± radiotherapy.

Eleven carcinoma buccal mucosa undergone radical neck dissection and 18 patients had modified radical neck dissection.

Mandible reconstruction, fibular bone graft in best option for both form and function. Two patients underwent mandibular reconstruction by use of vascularized fibular bone.

Primary closure of defect is possible if surrounding tissue is lax. Primary closure after excision of tumor done in 12 cases(40%).In buccal mucosa carcinoma, free flap provides reconstruction for complex defect. In present study, PMMC flap mostly used for reconstruction of defect. In 13 patients (72%) PMMC flap is used.

The complications noted:-

1. Immediate – flap necrosis
2. Late – Recurrence

In immediate post operative period there was flap necrosis in 2 cases and recurrence was seen in 4 cases..

REFERENCES

1. Singhania V, Jayade BV, Anehosur V, Gopalkrishnan K, Kumar N. Carcinoma of buccal mucosa: A site specific clinical audit. Indian J Cancer 2015;52:605-10.
2. Kim IH, Myoung H. Squamous cell carcinoma of the buccal mucosa involving the masticator space: a case report. J Korean Assoc Oral Maxillofac Surg. 2017;43(3): 191–196.
3. Shah JP, Cendon RA, Farr HW, Strong EW. Carcinoma of the oral cavity. factors affecting treatment failure at the primary site and neck. Am J Surg. 1976;132:504–507.
4. Veggers JW, Snow GB, van der Waal I. Squamous cell carcinoma of the buccal mucosa. A review of 85 cases. Arch Otolaryngol. 1979;105:192–195.
5. Kuk SK, Kim BK, Yoon HJ, Hong SD, Hong SP, Lee JI. Investigation on the age and location of oral squamous cell carcinoma incidence in Korea. Korean J Oral Maxillofac Pathol. 2015;39:393–402.
6. Lin CS, Jen YM, Cheng MF, Lin YS, Su WF, Hwang JM, et al. Squamous cell carcinoma of the buccal mucosa: an aggressive cancer requiring multimodality treatment. Head Neck. 2006;28:150–157.
7. Surgery for oral cancer. Cancer Treatmetnet Centers of America.
8. Shah JP, Gil Z. Current concepts in management of oral cancer—surgery. Oral Oncol. 2009;45(4-5):394–401.
9. Hidalgo DA. Fibula free flap mandibular reconstruction. Clin Plast Surg. 1994 Jan;21(1):25–35.
10. Brown JS, Magennis P, Rogers SN, Cawood JI, Howell R, Vaughan ED. Trends in head and neck microvascular reconstructive surgery in Liverpool (1992–2001) Br J Oral Maxillofac Surg. 2006 Oct;44(5):364–370.
11. Tandon P, Dadhich A, Saluja H, Bawane S, Sachdeva S. The prevalence of squamous cell carcinoma in different sites of oral cavity at our Rural Health Care Centre in Loni, Maharashtra - a retrospective 10-year study. Contemp Oncol (Pozn). 2017;21(2):178–183.
12. Chen YK, Huang HC, Lin LM, Lin CC. Primary oral squamous cell carcinoma: an analysis of 703 cases in southern Taiwan. Oral Oncol. 1999 Mar;35(2):173–9.
13. Young AMH, Bache S, Segaren N, Murphy S, Maraka J, Durrani AJ. Free Flap Selection and Outcomes of Soft Tissue Reconstruction Following Resection of Intra-oral Malignancy. Front Surg. 2019 Dec 20;6:53.
14. Chaudhary R, Akhtar MS, Bariar LM, Khurram MF. Use of pectoralis major myocutaneous flap for resurfacing the soft tissue defects of head and neck. J Orofac Sci 2014;6:88-93
15. Tripathi M, Parshad S, Karwasra RK, Singh V. Pectoralis major myocutaneous flap in head and neck reconstruction: An experience in 100 consecutive cases. Natl J Maxillofac Surg. 2015;6(1):37-41.
16. Anehosur V, Dikhit PS, Nagraj N, Jayade B, Kumar N. PMMC Flap Revisited and its Clinical Outcome in 150 Patients. J Maxillofac Oral Surg. 2020 Mar;19(1):26-31.