

Original Article

A study on concordance of pre and post-surgical biopsy in oral carcinoma

Sebastian J¹, Satheesan B², Emmnuel SP³, Sandeepa NC⁴, Asif SM⁵, Kaleem SM⁶, Barthunia B⁷

¹Dr Jeena Sebastian
MDS, Sr Lecturer, Dept. of Oral
Medicine & Radiology, Mahe Institute
of Dental Sciences and Hospital
Mahe, U.T. of Pondicherry
drjeenashibu@gmail.com

²Dr Satheesan B
Director, Professor, Dept of Surgical
Oncology, Malabar Cancer Centre
Thalassery, Kannur DT, Kerala
directormcctly@gmail.com

³Dr Shibu P Emmnuel
MDS, Professor and HOD
Dept of Oral Pathology
Pariyaram Dental College, Pariyaram,
Kerala, shibupe@gmail.com

⁴Dr Sandeepa NC
MDS, Assistant Professor
drsandeepanc@gmail.com

⁵Dr Shaik Mohammed Asif
MDS, Assistant Professor

⁶Dr Sultan Mohammed Kaleem
MDS, Assistant Professor
kaleemds19@gmail.com

^{4,5,6}Department of Diagnostic Science &
Oral Biology, College of Dentistry, King
Khalid University, College of Dentistry,
Abha, KSA

⁷Dr Bhavna Barthunia
MDS, Professor
Department of Oral Medicine &
Radiology, Daswani Dental College &
Research Hospital, Kota Rajasthan,
India, bhavnashell@rediffmail.com

Received: 11-10-2017

Revised: 23-10-2017

Accepted: 30-10-2017

Correspondence to:

Dr Shaik Mohammed Asif
masif020@gmail.com

ABSTRACT

Background: Clinically suspicious oral lesions are usually first dealt with an incisional biopsy. The management and treatment plan of these entities depends mainly on this report. The disparity in incisional and excisional biopsy report is an important area of concern affecting the patient's management.

Objective: Aim of the study was to compare retrospectively the incisional (pre-surgical) and excisional (post-surgical) biopsy reports of proven cases of carcinomas.

Material and Methods: A total of 98 excisional biopsy cases of proved oral carcinoma were selected. Both incisional and excisional biopsy reports were retrieved. Sex predilection, Frequency of site of tumor, correlation between incisional and excisional biopsy, type of biopsy and change in the status were studied and statistically analyzed. Significance between Pre-biopsy and post biopsy was statistically analyzed using Chi-Square Tests.

Results: There was concordance of 66.3% in incisional and excisional biopsy report. 33.7% cases showed disparity. Upgrading in the excisional biopsy report was noted in 15.30% cases. Downgrading was noted in 14.26% cases. When statistically analyzed the difference in pre-and post-biopsy was statistically insignificant.

Conclusion: Incisional biopsy was found to have certain restriction in the valuation of Oral lesions. Clinicians should be vigilant the possibility of under diagnosis from incisional biopsy and even undetected carcinoma in the incisional specimen, especially of nonhomogeneous lesions.

Keywords: Incisional biopsy, concordance, disparity, oral carcinoma, excision

Introduction

Current gold standard for the diagnosis of potentially malignant disorders and clinically suspicious carcinomas is histopathologic assessment. Proper management of these lesions starts with an accurate diagnosis. Conservative treatment, complete excision or cancer treatment is implemented based on it. An accurate histopathologic diagnosis depends on the clinician doing an appropriate biopsy, providing adequate clinical information, and on

the pathologist correctly interpreting the biopsy results.^[1]

Discrepancy in the incisional and excisional biopsy report is a key area of research. In case of potentially malignant disorders, moderate to severe dysplasia warrants complete excision, patient motivation, education and regular follow up. If incisional biopsy shows downgrading of the severity of dysplasia and if the patient compliance is poor, it leads to a situation where the patient may return with a

frank carcinoma in the future. [2,3] The same is applicable in case of carcinoma. The treatment modality and margin of the surgical lesion depends on the incisional biopsy report. The reliability on incisional biopsy can at times lead to misdiagnosis and under treatment of the lesion which again can affect the prognosis.

Present study was carried out in a Cancer Centre and oral carcinoma patients who had undergone complete excision of the lesion were selected and the report was retrospectively studied. The study evaluated the concordance in the pre and post-surgical biopsy report and discussed the supposed clinical and pathologic factors for the pitfall.

Material and Methods

A total of 98 excisional biopsy cases of proved oral carcinoma were selected. Subjects included were those who have undergone incisional biopsy at Malabar Cancer Centre and also the patients who had undergone incisional biopsy from other institution and histological confirmation done by slide review in the above mentioned Centre, before excision of the lesion. Both incisional and excisional biopsy reports were retrieved. Sex predilection, Frequency of site of tumor, correlation between incisional and excisional biopsy, type of biopsy and change in the status were studied and statistically analyzed.

Cases of oral carcinoma patients who had undergone total resection of the lesion at Malabar Cancer Centre between 2012 and 2013 were reviewed. Patient's data was retrieved and incisional and excisional biopsy report was analyzed. Males and females of all age groups were selected. Significance between Pre-biopsy and post biopsy was statistically analyzed using Chi-Square Tests.

Patients were in 30-80 age groups. Out of 98 cases, 44 were females and 54 were males. Most common sites of oral carcinoma involved were tongue followed by buccal mucosa, alveolus, floor of mouth, gingivo buccal sulcus, lip, retromolar trigone and hard palate. Out of 98 cases, malignancy of tongue was 41. 29 cases were in buccal mucosa. Alveolus was involved in 11 patients. Floor of mouth and gingivobuccal sulcus were involved in 4 cases. Three cases each were noted in the region of hard palate, lip and retromolar area.

Out of 98 cases, 65 cases didn't show any change in incisional and excisional biopsy reports. 33 cases had disparity in incisional and excisional biopsy reports. Out of 28 cases of incisional biopsy, 9 cases showed changes in the post-surgical biopsy reports. 19 cases were consistent with incisional biopsy reports. Punch biopsy cases were 3. Out of which one case showed disparity in the excisional biopsy report and 2 cases were of the Slide review cases were 67 in which lesions were undergone biopsy outside and were reviewed in the present Centre. 44 cases of slide review showed same result in incisional and excisional biopsy. 23 cases showed disparity in incisional and excisional biopsy report. (Table 1)

When compared with type of biopsy and disparity in the biopsy results, slide review cases showed a slight increase in difference in the results. Out of 67 cases of slide review, 23 showed difference in the excisional biopsy report. Out of 31 cases of biopsy performed in the same centre, 10 cases showed change in the histopathology of the excision. Punch biopsy was performed in 2 cases, and 1 case showed disparity. By applying chi square test we get p-value 0.294, thus there is no statistical significance between type of biopsy and status.

Results

Table 1: Status Vs Type of biopsy (n=98)

Count		Type of biopsy			Total
		Incision	punch biopsy	slide review	
Status	no change	19	2	44	65
	Change	9	1	23	33
Total		28	3	67	98

Chi square=33.670; df=30; P=0.294

Table 2: Significance between Pre biopsy and post biopsy

Incisional biopsy report	Excisional biopsy report	Change of grade(in percentage)
Moderately differentiated SCC	Well differentiated SCC	13.26%
Poorly differentiated SCC	Well differentiated SCC	2.04%
Well differentiated SCC	Moderately differentiated SCC	8.16%
Dysplasia	Well differentiated SCC	4.08%
Moderately differentiated SCC	Poorly differentiated SCC	1.02%
Well differentiated SCC	Poorly differentiated SCC	1.02%
Well differentiated SCC	Verrucous carcinoma	2.04%
Verrucous carcinoma	Well differentiated SCC	3.06%

Out of 98 cases; upgrading in the excisional biopsy report was noted in 15.305% cases. 8.163% cases of well differentiated squamous cell carcinoma in presurgical biopsy was changed to moderately differentiated squamous cell carcinoma. 4.081% cases of epithelial dysplasia in incisional biopsy reported as well differentiated squamous cell carcinoma in excisional biopsy. 3.061% cases of verrucous carcinoma in incisional biopsy turned to be well differentiated squamous cell carcinoma. Change of well differentiated squamous cell carcinoma to poorly differentiated squamous cell carcinoma in pre-and post-surgical biopsy was in 1.020% cases and moderately differentiated squamous cell carcinoma to poorly differentiated squamous cell carcinoma was in 1.020% cases.

Downgrading in excision biopsy report was noted in 14.264% cases. Moderately differentiated squamous cell carcinoma cases were changed to well differentiated squamous cell carcinoma in 13.265% cases in post-surgical biopsy report. Other changes were well differentiated squamous cell carcinoma to verrucous carcinoma in 2.040% and poorly differentiated squamous cell carcinoma to well differentiated squamous cell carcinoma in 2.040% cases. The proportion of changes in grade were statistically analysed and it was statistically insignificant.

Discussion

The Present Study was performed in a cancer Centre to evaluate the concordance in pre and post-surgical biopsies of oral carcinoma. Data was collected and evaluated and it showed that there was concordance of 66.3% in incisional and

excisional biopsy report. 33.7% cases showed disparity. Upgrading in the excisional biopsy report was noted in 15.30% cases. Downgrading was noted in 14.26% cases. When statistically analyzed the difference in pre and post biopsy was statistically insignificant. When compared with other studies in literature, present study showed comparatively less percentage disparity in incisional and excisional biopsy results.^[3] Another important fact was that downgrading of the grade was also noted in our study along with upgrading of the lesions with same frequency. Reviewing of literature revealed that reports of upgrading was the most discussed element and no literature regarding the frequency of downgrading in the lesion.

It is possible that more dangerous areas are removed during incisional biopsy and thus excisional biopsy showed less grade in the biopsy indicating that most serious part of the lesion was included in the biopsy. 13.26 % of the lesion in our study showed downgrading. Selection of biopsy site in our cases was based on inspectory and palpatory findings of the lesion. Specimens were taken from areas with ulcerated, erythematous, exophytic, verrucous, or with indurated components, when present. Though this is followed, tissues with the most serious histologic changes could still be missed. In our case, single site was biopsied and histopathologically evaluated. The proper incisional biopsy technique was followed and tissue was subjected to histopathological examination by a single pathologist. Giunta et al. had listed the reasons for false negative or missed diagnosis of oral cancer by biopsy. He divided the sources of under diagnosis into two

main entities: clinical and pathologic.^[4] It was shown that patients receiving multiple site biopsies had significantly lower rates of under diagnosis and unexpected carcinoma. Excisional biopsy is theoretically superior because it is possible to histopathologically examine the entire clinically abnormal region which is supported by the studies. In a study, carcinoma was not reported in 12% of incisional biopsy cases.^[3] Few other studies also have shown carcinoma after resection, which was not detected in incisional biopsy.^[5] Lee et al studied the agreement rate between histological diagnosis of single site biopsy and after resection in case of leukoplakia. The agreement rate was only 56%. 29.5% of patients were actually underdiagnosed. The authors found that the rate of under diagnosis was reduced to 11.9% when multiple biopsies were taken initially.^[6] In a study of 46 nonhomogeneous Oral lesions, Pentenero et al. found that incisional biopsy underdiagnosed the disease in 23.9% of cases and that unexpected SCC was noted in 17.4% of the resection specimens.^[5]

Surgical factors play a significant part in the proper diagnosis in which biopsy site is crucial. Biopsy of a sample from the center of an ulcer, or its base, results in a nonspecific diagnosis. Adjacent intact mucosa, often configured as a raised border, should be the biopsy target: but an attempt to include tissue from the periphery may inadvertently lead to under diagnosis.^[7] Other surgical factors are artifacts or tissue distortion during removal of tissue by laser or electro surgery. These techniques can induce thermal artifacts including carbonization, nuclear elongation and vacuolar degeneration of tissue. If it is especially a small specimen it may affect the ability of the pathologist to accurately assess the tissue. Rough handling of the tissue can destroy the histological features and thus microscopic assessment turned to be useless.^[8] The 'traditional' technique using toothed tissue forceps to grasp the specimen away from the main site of interest to be followed.^[9]

Excisional biopsy is theoretically superior; however there is risk of incomplete treatment of

malignant lesions and overtreatment of benign one. Certain techniques are proposed to improve the accuracy of incisional biopsy. Several clinical studies have shown a good efficacy of *in vivo* staining with toluidine blue for the detection of dysplasia and malignancy. However, widespread application of toluidine blue staining should be undertaken with caution, because there is no study assessing its use outside specialty centers or by individuals with limited experience in interpreting the stain. It is also shown that the results of vital tissue staining are not always fully reliable.^[10] Punch biopsy can be done but the tissue obtained is usually distorted and insufficient which can give false result. Our study established the fact by showing the disparity in 1 case of punch biopsy out of 2 cases.

Histopathological assessment is also crucial in the disparity of the incisional and excisional biopsy report. Many reports highlighted the subjectivity and observer variability (inter- and intra-observer variability) in the histopathologic assessment of oral dysplasia and carcinoma. It might partially due to the lacking well defined criteria and objectivity for the grading of epithelial dysplasia.^[11] Review of the specimens resulted in the falling of the under diagnosis ratio from 23.9% to 4.4%. To eliminate inter observer variability the specimens can be primarily examined by one pathologist. Intra observer variability can be minimized by periodic self-calibration of the pathologists. Although difficulties in interpretation of incisional specimen may still exist,^[5] but according to Pentenero et al disparity was not significantly influenced by intra- or inter observer variability, but could be due to the difficulties encountered by the pathologist during the evaluation of specimen because the reporting pathologists may worry about over diagnosis resulting in more radical therapy.

A retrospective study was done to compare pre surgical and post-surgical biopsy report in cases of clinically diagnosed cases of carcinoma. In conclusion, incisional biopsy was found to have certain limitation in the assessment of OL, and the major source of error may come from the wrong choice of biopsy site.

Clinicians should be alert to the possibility of under diagnosis from incisional biopsy and even carcinoma undetected by incisional specimen, especially in the face of nonhomogeneous lesions. Multiple biopsies with judicious use of in vivo staining, proper surgical technique with correct tissue handling can be followed.

References

1. Poh CF, Samson Ng, Berean KW, Williams PM, Rosin MP, Zhang L. Biopsy and Histopathologic Diagnosis of Oral Premalignant and Malignant Lesions. *J Can Dent Assoc* 2008;74(3):283-8.
2. Bailey JS, Blanchaert RH, Ord RA. Management of oral squamous cell carcinoma treated with inadequate excisional biopsy. *J Oral Maxillo fac Surg* 2001;59:1007–10.
3. Lee J, Hung H, Cheng SJ, Chiang CP, Liu BY, Yu CH, et al. Factors associated with under diagnosis from incisional biopsy of oral leukoplakic lesions. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;104:217-25.
4. Giunta J, Meyer I, Shklar G. The accuracy of the oral biology in the diagnosis of cancer. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1969;28:552-6.
5. Pentenero M, Carrozzo M, Pagano M, Galliano D, Broccoletti R, Scully C, et al. Oral mucosal dysplastic lesions and early squamous cell carcinomas: under diagnosis from incisional biopsy. *Oral Dis* 2003; 9:68-72.
6. Lee JJ, Hung HC, Cheng SJ, Chen YJ, Chiang CP, Liu BY, et al. Carcinoma and dysplasia in oral leukoplakias in Taiwan: prevalence and risk factors. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006;101:472-80.
7. Sylvie-Louise Avon SL, Klieb H. Oral Soft-Tissue Biopsy: An Overview. *J Can Dent Assoc* 2012;78:c75.
8. AN Goss, RM Logan. Biopsy of the oral mucosa and use of histopathology services *Australian Dental Journal* 2010;55:9–13.
9. Oliver RJ, Sloan P, Pemberton MN. Oral biopsies: methods and applications. *Br Dent J* 2004;196(6):329-33.
10. Onofre MA, Sposto MR, Navarro CM. Reliability of toluidine blue application in the detection of oral epithelial dysplasia and in situ and invasive squamous cell carcinomas. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2001;91:535-40.
11. Lumerman H, Freedman P, Kerpel S. Oral epithelial dysplasia and the development of invasive squamous cell carcinoma. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995;79:321-9.

Cite this article as: Sebastian J, Satheesan B, Emmuel SP, Sandeepa NC, Asif SM, Kaleem SM, Barthunia B. A study on concordance of pre and post-surgical biopsy in oral carcinoma. *Int J Med and Dent Sci* 2018;7(1):1632-1636.

Source of Support: Nil
Conflict of Interest: No