Preferred Oral Biopsy Techniques Among Dentist: An Insight

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ABSTRACT

Background: Biopsy is a surgical procedure to obtain tissue of living organism for its histopathological examination, usually to have a diagnosis of early disease progression. Broadly Biopsy can be classified as incisional or excisional biopsy. Depending on the topography involved, the biopsy can be obtained from the oral mucosa in its different locations, the salivary glands, bone, lymph nodes, and other head and neck tissues. Major cause for a biopsy is histopathological confirmation of suspected benign or malignant lesions, non-healing ulcers and major bony lesions after radiographical and clinical investigations. In South Asia biopsy is still gold standard for suspected lesions especially cancers. Objective: Our study’s objective was to evaluate the most frequent oral biopsy technique employed at the dental section, of Dow University of Health Sciences Karachi. Methodology: A cross sectional study was conducted using previously recorded data about biopsy technique employed in dental section, having sample size of 644. Using SPSS ver 21.0, Chi-square goodness of fit test was applied to determine proportion difference among different biopsy techniques and chi-square test of association was applied to see proportion differences among male and female. P-value of less than 0.05 was considered as significant. Results: Incisional biopsy at 55% was the frequent technique employed, with male predominant than excision and punch biopsy techniques. Conclusion: This was a preliminary data on oral biopsy techniques, further related research on a larger population size or multicenter study data would enhance most viable technique employed for oral biopsies in local population.

Keywords: Biopsy, Techniques, Cancer, Excisional, Incisional

Abbreviations: DUHS (Dow University of Health Sciences), DIKIOHS (Dr Ishrat Ul Ibad Khan Institute of Oral Health Sciences), FNA(Fine needle aspiration).
1. INTRODUCTION

Dental experience, clinical outcomes and awareness are considered as backbone of successful decision and diagnosis [1]. In certain scenarios, for definite diagnosis, reliable and certain investigative techniques can be performed for exclusion or confirming certain diseases [2]. Scott Se et al stated struggles to line up dentist in 21st century on a more scientific platform necessitate us as being “physicians” of oral cavity [3]. Wrong or miscalculated diagnosis of diseases of oral cavity, can have severe consequences for both patient and dentist [4]. There is a plethora of investigative techniques and radiographic examinations that can reveal enough information for diagnosing certain entities [5]. Oral lesions, including oral mucosal lesions can exhibit unique histopathological and clinical patterns [6]. This is due to effect of saliva and its interaction with complex structures of different oral mucous membranes [5]. Correlating clinical and histopathological findings is helpful for diagnosing oral lesions [7]. With respect to deciding treatment options that are as a result of definitive diagnosis, biopsy is the most profound histopathological examination, that can reveal accurate diagnosis of patient oral clinical lesion [8,9,10,11,12].

Biopsy is a surgical procedure to obtain tissue of living organism for its histopathological examination, usually to have a diagnosis of early disease progression [13]. The objectives behind performing biopsy are confirmation of clinical and radiographic findings, to determine whether an abnormality has been completely removed and for the proper surgical management.

Biopsy is usually indicated for accessing oral abnormalities not easily explained that remains even after removal of local causes. Susceptibility of malignancy is usually presented as persistent white or red oral lesions with topographical representation of ulcer, indurated deeper or fixed tissues. Lesions that persist and have spontaneous bleeding must alarm clinician for susceptibility of malignancy. Pigmented lesions that demonstrated changes or are new can be of concern to a clinician. Recommendation of biopsy is on the basis the pigmented lesions that persist for five years or more [14].

Oral epithelial turnover and frictional mucosal changes associated to diet, chewable and smoked tobacco has pushed oral cancer to top the list of worldwide cancers [15]. South Asian region including India, Pakistan, Bangladesh, Sri Lanka, Bhutan, Nepal, Iran and Maldives report higher incidence of oral cancer [16]. Most important diagnostic tool for the oral cancer includes various biopsy techniques [17]. Benign or clinically demarcated lesions need to be excised via excisional biopsy. Any organ in the body can be undergo biopsy using variety of techniques, some of which require major surgery (e.g. staging splenectomy for Hodgkin’s disease), while others do not even require local anesthesia (e.g. fine needle aspiration of thyroid, breast, lung, liver etc). Oral biopsy can be performed by various ways [18]. Depending upon the characteristics of the lesion, biopsy may be broadly classified into direct (superficially located lesion) or indirect (deeply located lesion) [19]. Furthermore, biopsy may also be classified in accordance with the techniques used, the materials utilized, procedure timing and purpose [20].

Biopsy can be classified according to amount of suspected tissue excised as incisional or excisional biopsy. Depending on the topography involved, the biopsy can be obtained from the oral mucosa in its different locations, the salivary glands, bone, lymph nodes, and other head and neck tissues. According to Kar S et al, biopsy is indicative for suspected neoplasms, persistent change in lesion color or growth, painful bony lesions, on healing ulcers and etc. He further stated certain contraindications of biopsy such as poor health of patient, presence of virulent, pyogenic infection, presence of systemic diseases and massive blood loss, or hear of secondary complications. Accurate diagnosis by oral pathologist depends on proper biopsy techniques followed by the dental surgeon, so that it can be beneficial to the patient’s health. Thus, every dental surgeon should have good knowledge of oral biopsy indications and the surgical techniques.

Study objective is to evaluate the most frequent oral biopsy technique employed at dental section of Dow University of Health Sciences, Karachi.

We hypothesized that incisional biopsy technique is employed more frequently than any other biopsy technique.

2. METHODS

It is retrospective cross-sectional study, based on recorded data from department of histopathology, DIKIHOS, DUHS, Karachi. Non-probability purposive sampling technique was employed to collect samples from Department of Histopathology, Dental Section of DIKIOS, DUHS, Karachi. Study included 644 patients age between 40-70 years, including 425 males and 219 females. The duration of the study was...
4 years (Jan 2010 – Dec 2014). Sample size was calculated from pilot study via cross tabulation of gender and biopsy techniques on 30 patients. Using PASS version 11, a sample size of 644 was achieved with 80% power to detect an effect size (w) of 0.1105 using a degree of freedom chi-square test with a significance level (alpha) of 0.05. SPSS version 21.0 was used to interpret frequency among biopsy techniques employed in dental section, DUHS, Karachi. Chi-square goodness of fit test were used to determine proportion difference among different biopsy techniques and chi-square test of association was applied to see proportion differences among male and female. P-value of less than 0.05 was considered as significant.

3. RESULTS

Results are represented in form of tables and figures. 66% patients were male and 34% patients were female with mean age of 52 ± 5 years. 54.8% incision biopsy, 30.1% excision biopsy and 15.1% punch biopsy techniques were employed respectively. Fig 1 report gender variation and Fig 2 report variation in biopsy technique performed.

Table 1: Baseline characteristics of the Biopsy Patients (n = 644)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>425  (66.0)</td>
</tr>
<tr>
<td>Female</td>
<td>219  (34.0)</td>
</tr>
<tr>
<td>Biopsy Technique</td>
<td></td>
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<tr>
<td>Incision biopsy</td>
<td>353 (54.8)</td>
</tr>
<tr>
<td>Excision</td>
<td>194  (30.1)</td>
</tr>
<tr>
<td>Punch biopsy</td>
<td>97   (15.1)</td>
</tr>
</tbody>
</table>

*p-value has been calculated using chi-square test

Table 2: Association between gender and biopsy techniques (n = 644)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Incisional biopsy (n = 353)</th>
<th>Excisional biopsy (n = 194)</th>
<th>Punch biopsy (n = 97)</th>
<th>*p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>425</td>
<td>240 (56.5)</td>
<td>117 (27.5)</td>
<td>68 (16.0)</td>
</tr>
<tr>
<td>Female</td>
<td>219</td>
<td>113 (51.6)</td>
<td>77 (35.2)</td>
<td>29 (13.2)</td>
</tr>
</tbody>
</table>

* Figure 1: Biopsy Technique

* Figure 2: Biopsy technique by gender

Chi-square test showed that there is no association between gender and biopsy technique. ($\chi^2=4.149$, p-value=0.126).

The chi-square goodness-of-fit test shows that the test statistic is statistically significant ($\chi^2=155.63$, p-value<0.001). Therefore, we can reject the null hypothesis and conclude that there are statistically significant differences in the proportions of cases in each type of biopsy technique, with more cases using incision biopsy (n=353) compared to either excision biopsy (n=194) or punch biopsy (n=97).

4. DISCUSSION

Oral biopsy is most important tool and frequent method performed in dental practice to investigate suspicious premalignant or malignant lesion. The basic objective of the study was to find most frequently employed oral biopsy technique in Dental Section, DUHS, Karachi. Incisional biopsy was most frequently employed technique with 353 cases having a percentage of 54.8% as compared to all other biopsy technique employed in Duhs, Karachi. According to the Oliver et al, the majority of mucosal biopsies are incisional [6]. This relates to our finding as incisional biopsy is the technique most frequently employed in Dental Section, DUHS, Karachi. Study by Frydych et al on use of biopsy techniques on cancer patients also came to similar conclusion as their study subjects had 16% excisional biopsy and 84% incisional. In line with current findings he reported increased male preponderance for incisional biopsies. According to Husain et al, Fine needle aspiration (FNA) biopsy has been rarely used in oral and oropharyngeal lesions. FNA biopsy of intraoral and oropharyngeal masses is a valuable procedure for initial evaluation of lesions. The incisional biopsy is most frequently used in oral biopsy techniques as being least invasive and least traumatic. According to Amparo et al, oral biopsies are considered essential for the definitive diagnosis of diseases of the oral mucosa, and for the subsequent planning of appropriate treatment. Male gender predilection with higher chewable and smoked tobacco usage increases risk factors that lead to development of oral cancers are more commonly associated with males as compared to females, hence we report increase in incisional biopsies in males. The fact that incisional biopsy was the preferred technique in our study can be explained by Frydych et al report who stated increased tumor size and stage to be associated with biopsy type (Incisional). In Pakistan due to lack of awareness and increase consumption of carcinogens in form of smoked and chewed tobacco, there is high prevalence of oral cancer and patient report to doctor when lesion has progressed considerably and is symptomatic. A study conducted in Liaquat University Hyderabad in 2014 also relates to our study; they found nature and frequency of oral biopsy. Sample size of that study was 180 patients reported to dental ward for incisional, excisional and punch biopsies. 66.1% were males and 33.8% were females with age range from 10-80 years. They reported increased frequency of incisional biopsy in mucosal lesions.

5. CONCLUSION

This was a preliminary data on oral biopsy techniques, further related research on a larger population size, multi-center study and comparing biopsy techniques employed in different stages of oral cancer will reveal more conclusive findings.
REFERENCES