

# Oral Biopsy in General Dental Practice: A Review

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## ABSTRACT

Oral biopsy is considered essential for diagnosis of diseases of the oral mucosa, and subsequent treatment planning. Taking biopsies are widely used in all specialties of medical fields; the practice is not common among dental practitioners, this may be because of lack of awareness among Dental surgeons. The ability of the oral pathologist to interpret a lesion is mainly dependent on a good biopsy performed by the dental surgeon. The purpose of this review is to discuss indications, contraindications of taking oral biopsy and highlight important potential pitfalls that may occur during biopsy technique, an effort has been made to discuss the role of a Dental surgeon in diagnosing the pre-malignant, malignant lesions thereby helping in decreasing the incidence of oral cancers is also discussed here.

## INTRODUCTION

The word biopsy originates from the Greek terms bios (life) and ophis (vision): vision of life. Biopsy is defined as “the removal and excision of tissue or other material from the living body for the purpose of diagnosis”.<sup>[1]</sup> Basically the reasons for performing a biopsy are i) To establish a definitive diagnosis as early as possible so that correct treatment may be initiated without delay, ii) to establish a prognosis in malignant or premalignant lesions iii) To determine whether an abnormality has been completely removed, iv) act as a document with medical legal value.

It must be taken into account the early diagnosis is very important in treatment planning and prognosis of

the disease. Failure to diagnose oral disease may have profound implications for both the patient and the dentist.<sup>[2]</sup> As Dental Surgeons commonly encounter malignant and pre-malignant lesions in their day to day practice. They can play an important role in the prognosis of the oral cancers by referring the patient to higher centers. They can make a considerable contribution to a decrease in its incidence by identifying high risk patients and educating them in healthy habits.<sup>[3,4]</sup>

## INDICATIONS FOR BIOPSY

1. Any Lesion that persists for more than 2 weeks with no apparent etiologic basis.
2. Any inflammatory lesion that does not respond to the treatment even after 2 weeks.
3. Any persistent hyperkeratotic lesion.
4. Any lesion suspected as neoplasm.
5. Lesions of unclear aetiology, particularly when associated with pain, paraesthesia or anaesthesia.
6. Inflammatory changes of unknown cause that persists for long periods.

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7. Lesions that interfere with oral function, such as fibrous hyperplasias and osseous lumps.
8. Radiolucent or radio-opaque osseous lesions.
9. Any tissue spontaneously expelled from a body orifice.
10. Any tissue surgically excised.
11. Material from a persistent draining sinus whose source cannot be readily identified.
12. Interstitial lesions in lingual, buccal or labial muscles.

## CONTRA-INDICATIONS FOR BIOPSY

1. When the general condition of the patient is very poor.
2. When acute, virulent, pyogenic infection is present.

There is no need to do biopsy of normal structures, nor is it necessary to do biopsy of inflammatory or infectious lesions that respond to specific local treatments, as in pericoronitis, gingivitis or periodontal abscesses. There is no need to do biopsy of irritative / traumatic lesions that respond to the removal of a presumed local irritant; moreover incisional biopsies should be performed on suspected angiomatous lesions.

## GENERAL GUIDELINES FOR ORAL BIOPSY

1. **Planning:** The biopsy should be planned before local anaesthetic is administered. Major vessels and nerves should be avoided and to minimize the risk of damage to smaller structures.
2. **Regional Block local anesthesia** rather than infiltrative techniques is preferred or if infiltration with local anesthesia is been used, it should be deep or in a field around the proposed biopsy site. Taking a tissue sample from the site of injection will produce artefactual tissue edema or distortion.
3. **Incisions** should be made parallel to their expected position, surgeons should be aware of regional anatomy (e.g.: Nerves and Vessels), elliptical incisions should be attempted in order to ease suture.
4. **Incisional or Excisional Biopsy:** If the lesion is smaller than 2 cms, excisional biopsy should be performed. If it is larger than 2cms, an incisional biopsy is advised which includes

representative areas of the lesion along with a healthy normal margins (2/3rd lesion and 1/3rd normal tissue). Most will be incisional biopsies rather than excisional biopsies. When a malignant lesion is suspected, incisional biopsy technique is mandatory.

5. **Site Selection:** Select the worst-looking area for biopsy, Avoid biopsying the center of an ulcer or necrotic area. Smaller lesions of less than 2cms should be excised, where the entire lesion is removed with surrounding margins of the normal tissue. For larger lesions incisional biopsy is performed, where the most represented site is biopsied. There may be discrepancies in the histological features found from one site within the lesion to another site, in such cases, multiple smaller biopsies of the lesion may be taken in order to provide such representative tissue to the oral pathologist for examination. In case of suspicious lesion or there is doubt regarding malignant characteristics of the lesion, vital staining with toluidine blue can be used as an adjunct to select representative area of the lesion.
6. **Preparation of surgical field:** 0.20% Chlorhexidine solution is preferred. Iodine containing surface antiseptics should be avoided.
7. **Orientation:** Samples must be oriented with a suture before they are placed in a fixing solution. Use of tags with the suture will be of immense help to the oral pathologist and enhance accuracy in his reports particularly regarding clearance of margins of tumor,<sup>[5]</sup> this should be accompanied by the self explanatory notes and diagram. Labeling the superior or inferior borders / anterior or posterior surface by suturing through and through of the tissue.<sup>6</sup> Do not forget to mention the dimensions when there is marked difference in the top and bottom sides.<sup>[6]</sup>
8. **Fixation Solution:** 10% Formalin solutions is used, the samples should never be put in saline or distilled water. The role of fixative solution is to arrest autolysis and putrefaction and to stabilize the protein of the cells. The total volume of the specimen should be at least 20 times the size of the tissue specimen.<sup>[7]</sup>
9. **Sutures:** By giving sutures good hemostasis can be achieved, and it also helps in faster healing. Sutures can be removed after one week.
10. **Relevant information:** The specimen should always be accompanied by a form containing

relevant information about the patient with brief case history: Name, Age Sex, Chief Complaint, and Duration of the complaint, Clinical data, provisional diagnosis and differential diagnosis. If possible photographs of the lesion, radiographs, and other laboratory investigations.<sup>[6]</sup>

11. Specimen Bottles: plastic or glass bottles are commonly used. The specimen bottles should be securely closed to prevent evaporation of the formalin and spillage of the specimen. With a clear sign on the bottle, **“Pathological Specimen - Fragile ( Handle with Care)”**

### COMMONLY OCCURRING ARTEFACTS DURING ORAL BIOPSY PROCEDURES, THE DENTAL SURGEONS SHOULD AVOID

- i) Infiltrating local anaesthetic solution within the lesion as it may cause sample alterations. Local anaesthetics should be administered deep or in a field around the proposed biopsy site. A regional block can also be used, the problem with regional block is that the haemostatic effect of the adrenaline in the local anaesthetic solutions is lost.
- ii) Crushing of the tissue with tissue forceps during the procedure: (Seone J *et al.*)<sup>[8]</sup> reported that most frequently cause of artefacts in specimen submitted by an Dental Surgeon is “Crush Artefacts”. The crushing of the tissue with the tissue forceps during the procedure can destroy the histological features of the tissue sample and may produce tissue tears and ‘pseudomicrocysts’. A popular method employed by the Oral surgeons is to place a suture in the tissue sample that is to be removed, and holding the tissue sample with a artery forcep.
- iii) Applying Products to the lesion that induce tissue modification:
 

Using Coloured antispectics to clean the surface of incision on the mucosal site where biopsy is to be taken should be or should not be used specially iodine containing surface antisptics should not be used, as they may stain the tissues, it is adviced to use 0.12–0.20% chlorhexidine solution is preferred. Toluidine blue do not interfere with staining.
- iv) Electrocautery produces thermal damage and artifact to the tissue biopsy, which makes it difficult for the pathologist to evaluate specially in the dysplastic and malignant lesions,<sup>[5]</sup> hence electrocautery should be avoided. Electrosurgery can be used where tissue margins are not necessary and where haemostasis is a major problem.
- v) Using Insufficient volume of fixation solution: When biopsy specimen is taken from the oral cavity, it should be immersed immediately into a fixative solution. The fixative solution most commonly used for routine biopsies is 10% neutral buffered formaline<sup>6</sup>. Inadequate fixation results in tissue degeneration, causing difficulty in interpretation. Ensuring an adequate amount of fixative solution, the fixative solution should be atleast twenty times the volume of the specimen.<sup>[7]</sup> Avoid placing the specimen in gauze, as gauze will absorb the fixative solution, later it becomes difficult to separate the specimen from the gauze.
- vi) Inclusion of undesired material into the sample like calculus, restorative material, glove powder: Unwanted tissues or material are included in the biopsy specimen, making it difficult for the pathologist to interpret, specially when taking a biopsy of the ginvival tissues, which is often accompanied by a fragment of calculus which may histologically mimic a actinomycotic infection.<sup>[5]</sup> even glove powder included into the tissue biopsy can suggest an erroneous aetiology to a tissue section of a foreign body granuloma.<sup>[5]</sup>
- vii) Taking insufficient amount of tissue: To correctly interpret a bisopy is dependent on the quantity of the specimen.<sup>[5]</sup> Shrinkage occurs most of the time during fixation and processing, therby reducing the biopsy size.

### IMPORTANCE OF ORAL BIOPSY FOR DENTAL SURGEONS

The global burden of cancer continues to increase largely because of the aging and growth of the world population alongside an increasing adoption of cancer-causing behaviors.<sup>[9]</sup> Oral Cancer is the 6th most frequent malignant tumour,<sup>[10]</sup> around 50,000 cases worldwide.<sup>[11]</sup> Morbidity and mortality of other types of cancers have decreased over the past few decades, but oral cancer has increased. Treatment of oral cancer can be unaggressive and easy when the diagnosis is early, with a survival rate of around 80%.<sup>[12]</sup> India accounts for 86% of the world’s oral cancer cases, says the study conducted by the National Institute of Public Health in February 2011.<sup>[13]</sup> High usage of tobacco

in India is the main reason for this high incidence. High prevalence of using tobacco products, especially among the youth was recently reported in the Global youth tobacco Survey.<sup>[14]</sup> There are nearly 300 Dental Colleges in all over the India. Despite number of Dental surgeon passing out from so many Dental institutions, Still India stands first among high incidence of oral cancer cases.

Biopsy has been used since more than 150 years to establish the diagnosis of an unknown medical condition.<sup>[15]</sup> Biopsy is one of the oldest and most reliable currently available methods that can establish the definitive diagnosis of clinical abnormalities in dentistry. Other highly specialized techniques like immunofluorescence, immunohistochemistry, and electron microscopy are available; none can take the place of biopsy.<sup>[15]</sup> When in doubt, one can never go wrong with a biopsy proven diagnosis.

Performing a biopsy (small incisional and excisional) procedure is well within the scope of training and ability for a general Dental practitioner.<sup>[6,15]</sup> too many oral cancer cases continue to be diagnosed at an advanced stage because biopsy was not performed when the first signs of disease were detected.<sup>[16]</sup> Patients are often present with intraoral pathology in general dental clinics. Its imperative for a Dental surgeons to know to deal with such pathologies. Irrespective whether the dentist performs the biopsy or whether he refers it to an specialist, still the referring Dentist should be familiar with the procedures of the Biopsy.<sup>[17]</sup> Dental surgeons can play an important role in diagnosing premalignant & malignant lesions in day to day practice and play an important role in the prognosis of the oral cancers by referring the patient to higher centers. They could make a considerable contribution to a decrease in its incidence by identifying high risk patients and educating them in healthy habits.<sup>[2,3]</sup>

Franklin and Jones<sup>[18]</sup> in their survey on oral and maxillofacial pathology specimen submitted by general practitioners reported that, despite the importance of histological examination of tissue, general practitioners do not submit specimens for examination. Other study by Diamanti *et al.*<sup>[19]</sup> shows most of the dental surgeons lack confidence and experience in dealing with the biopsy

procedure, Lack of training for biopsy procedure, the relative infrequency by which a dentist encounters oral pathological lesions when compared to other dental problems.<sup>[18]</sup>

Dental Surgeons have a professional obligation to diagnose and manage oral pathology, if it cannot be managed, it should be appropriately referred. Many Authors have suggested that Dental Surgeons should have adequate training to perform oral biopsy procedures.<sup>[15,17,19,20]</sup>

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