Oral Soft Tissue Biopsy - An Effortless Proficiency for Oral Lesion Investigation

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The incidence of oral cancer is rising day by day. Early detection of oral cancer is the best chance for cure. This can be achieved only if a biopsy is performed promptly to get relevant information about the precancerous lesion or condition. The following article describes various types of biopsies mainly stressing on punch biopsy, procedure, and the guidelines to perform a biopsy with their indications and contraindications.

**Keywords:** Diagnosis, Investigation, Oral cancer, Punch biopsy

INTRODUCTION

Accurate diagnosis is the only cornerstone on which rational treatment can be built. Inadequate investigations could lead to misdiagnosis.¹ Hence, an accurate diagnosis can be achieved by performing a biopsy. Biopsy, the word “bio” means life or tissue and the word “opsis” means vision or microscopy. Biopsy means the study of tissues using microscopy or life by vision or for life.² In other words, a biopsy is the surgical removal of living tissue for the purpose of microscopic examination. It is a procedure where a small part of tissue from the area of concern is removed for diagnosis and sent for microscopic examination.¹ Biopsy becomes customary when presented with a suspicious pre-malignant lesion which has higher chances of turning into cancer, hence most of the surgeons perform surgical biopsy before committing a patient to surgery or any other treatment modality.³

WHY PERFORM BIOPSY?

Good surgical technique is necessary to remove an adequate amount of tissue while preserving its morphology. A biopsy is used to confirm a clinical diagnosis and hence should be considered as one of the most important clinical procedures in dentistry.⁴ In cancer, cellular and tissue alteration occurs. Hence, a biopsy should not be delayed as, if unperformed, it may lead to inflammation, edema, or opening of new vascular channels and rapid growth in the size of the lesion. The delay in performing a biopsy should be avoided when there is the presence of fixed lymph nodes or when there is an unrecognized irritant that leads to ulceration and bleeding from the suspicious area of concern. Hence, earlier the biopsy is performed for diagnosis of oral cancer; best will be the prognosis of cancer.

INDICATION

Biopsy is essential if there is any clinical suspicion of malignancy, such as an enlarging mass, chronic ulceration, tissue friability, induration on palpation or persistence of mucosal changes despite removal of local irritants.¹,⁴,⁵ A biopsy is indicated when the signs and symptoms of tissue in the area of concern do not provide enough information to make accurate diagnosis. After completion of clinical examination if any alteration from the normal is seen then a histopathological examination becomes necessary. It is mandatory to perform a biopsy if neoplasia is one of the considerations in the differential diagnosis. A biopsy will thus provide a definitive diagnosis.¹,⁴,⁶

- Lesions which have neoplastic or potentially malignant or are enlarging – Erythroplakia, leukoplakia, lichen planus, focal pigmented lesions

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• Diagnostic test for evaluation of nonneoplastic lesions
  – Mucosal nodules, papilloma, erythema multiforme, pemphigus, pemphigoid, etc.
• Detection of nature and existence of malignancy to seek immediate treatment – Squamous cell carcinoma
• Persistent lesions of uncertain etiology – Soft or hard tissue
• Persistent lesions failing to respond to treatment – Ulcers or lesions such as radiolucent or radiopaque bone lesions
• Persistent focal lesions involving gingival/periodontium – Ulcers or nonhealing extraction socket
• Confimation of clinical diagnosis – Labial salivary gland biopsy to confirm Sjogren syndrome
• Screen abnormal tissues (screening test) removed from the oral cavity – Cyst or granuloma
• Lesions causing the patient extreme concern – Patient may prefer excision biopsy of a persistent red, white or pigmented lesion or overgrowth like irritational fibroma.

**TYPES OF BIOPSY**

The biopsy may be incisional (removal of a portion mainly the edge of the lesion) or excisional (removal of the entire small lesion) depending on the size of the lesion. The other types of biopsy are:
• Punch biopsy
• Fine needle aspiration cytology
• Oral brush biopsy
• Scrape and trephine biopsy
• Computed tomography guided biopsy
• Ultrasound guided biopsy
• Frozen section biopsy (when biopsy report is urgent).

**ARMAMENTARIUM**

Tissue specimen may be obtained by two methods:
• Technique not requiring anesthesia (exfoliative cytology)
• Techniques requiring local anesthesia.

Instrumentation for taking a biopsy specimen is simple. It requires:
• Sharp scalpels and blade #15
• Punch biopsy instrument
• Scissors
• Local anesthesia
• Specimen container
• Preservative solution made from one part concentrated formaldehyde solution and nine parts water (called 10% formalin)
• Suture material.

**HOW TO PERFORM BIOPSY?**

Care must be taken not to produce anxiety to the patient where it is not necessary. Informed consent is mandatory for performing biopsy procedure just like other operative procedures. Depending on the extent of the lesion, the type of biopsy can be chosen. Out of all types, the most commonly used are an incisional biopsy, excisional biopsy, or punch biopsy depending on the situation. Scalpel biopsy, for both incisional and excisional procedures, is the most common technique and generally yields the most satisfactory samples. The area of concern or site of biopsy (Figure 1) is air dried and isolated (Figure 2). After local anesthetic topical application, local anesthesia is injected in the area of concern (Figure 3). A biopsy is then carried out ensuring that both lesions, as well as the normal tissue, are included in the specimen removed. The punch biopsy has the advantage over the incisional biopsy because of a controlled incision, no requirement of suturing, gaining an adequate specimen for histopathological examination and causes less anxiety for the patient. A #15 number blade is used to carry out the biopsy.

In the case of incisional biopsy, an elliptical incision encompassing the selected area of the lesion is made. Mark
the area of concern with the blade such that it includes surrounding tissue as biopsy of the only lesion (ulcerative) is not enough. The incisional lines are usually deep enough to include underlying connective tissue and muscle. Do not squeeze the tissue with forceps as this can cause crush artifacts. The specimen obtained is usually wedge shaped. Sutures are placed at the end of the procedure.

In the case of small (<1 cm) or sessile or pedunculated lesions, with the help of scalpel and blade, the entire lesion is removed by applying excisional biopsy. An elliptical incision on either side of the base of the lesion is made such that incision lines meet each other. The blade should be at an angle of 45° toward the center of the lesion. With the help of forceps or suture, an outward tension is placed on the lesion keeping in mind not to crush the specimen. The specimen is now gently dissected or excised using either scalpel or surgical scissors. Surgical site is then sutured using nonresorbable sutures and patient is recalled after 7 days. It is thus not only a diagnostic but also a therapeutic procedure.

If the patient is disturbed by the sight of scalpel and incision is to be controlled, then punch biopsy is preferred. A punch biopsy may be used for either incisional biopsy or excision of a small lesion at an accessible site. It is a procedure where a sharpened hollow tube several millimeters in diameter is rotated downward in a twisting motion until the underlying muscle or bone is reached (Figure 4). The tissue core is then cut at the base with curved scissors or a scalpel (Figure 5) and is then removed in the same manner as in incisional or excisional biopsy (Figures 5 and 6). The tissue excised must be immediately placed onto a small piece of paper before immersing in fixative as this prevents curling and then submerged in 10% formalin for histopathological examination. Suturing is done using a fine needle and resorbable sutures such as Vicryl 3/0 or nonresorbable such as silk (Figure 7). This allows faster healing and good hemostasis. Suture removal is done after a week.

The patient is prescribed analgesic drugs to minimize discomfort felt after numbness is gone. Emergency contact information should be made available. Patients should be recalled 1-2 weeks postoperatively to ensure healing and to discuss the biopsy results.

**ADVANTAGES**

- It becomes possible to know histopathological nature of the lesion of any soft tissue
- Provides confirmed clinical diagnosis
- Differentiates between benign and malignant lesions
- Aid in determining grading of tumors
- Helps for the evaluation of recurrence

**DISADVANTAGES**

- Patient may become anxious
- In the case of bleeding disorders, it may become difficult to control bleeding
• Pain or soreness after injection wears off
• Swelling
• Bruising
• Rarely, altered sensation allergy or restricted mouth opening may occur.

LIMITATIONS

Although biopsy is a relatively simple surgical procedure, it does involve aesthetics, tissue manipulation and trauma. The contraindications for biopsy are as follow:
• When systemic health of patient is compromised
• Bleeding disorders and coagulopathies
• Immunocompromised patient
• Local anesthesia toxicity
• Patients currently using injectable bisphosphonates
• Any malignant neoplasm suspected for which biopsy would delay definitive care
• If the patient is uncooperative.

HOW AND WHY TO SUBMIT A BIOPSY?

Tissue removed in the course of surgical therapy should be placed in 10% neutral buffered formalin with at least 20 times the volume of the sample to avoid improper fixation or autolysis. The fixative should not be changed or diluted and the specimen is then submitted for microscopic examination by the oral pathologist to detect any dysplastic changes or suspect malignancy. The pathologist is better able to make definitive diagnosis if both, the suspected tissue as well as patient’s information are submitted together with a standardized biopsy requisite form provided by the laboratories. Along with patient’s personal details, it is mandatory to submit patient’s systemic health information, chief complaint, onset, duration of the lesion and brief description about the location, size, shape, color, and consistency of the lesion. The dentist should also mention provisional diagnosis in the biopsy requisite form. The biopsy request form should contain:
• Patient’s full name
• Patient’s date of birth
• Hospital case number
• Date
• Type of tissue (soft or hard)
• Type of biopsy (incisional, excisional, punch, or fine needle aspiration cytology)
• Site.

A simple sketch of the location of the lesion in the mouth will help the pathologist to simplify the diagnosis and hence formulating the written report.

The tissue of concern is sent in a labeled bottle. The container must be labeled with:
• Patient’s full name
• Date
• Case number
• Specimen site
• Provisional diagnosis
• Including a color photograph of the lesion can be helpful.

CONCLUSION

A biopsy is thus a painless though a little sore procedure of surgically removing a suspicious tissue sample from a patient for histopathological examination, thus providing confirmed the clinical diagnosis and valuable information in determining the prognosis and type of treatment required. It is thus useful for the diagnosis of pathologic lesions, neoplastic and nonneoplastic lesions of the oral cavity as well as treatment planning.
REFERENCES


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