



Biopsy

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Abstract:

Biopsy is the removal of tissue from a living organism for purposes of microscopic examination and diagnosis that helps to confirm disease. Diagnosis of many lesions can be made clinically by general dental practitioners and junior hospital staffs with experience, such diagnosis is generally provisional one, contingent upon the final report on the tissue specimen by pathologist. This purpose of this article is to review those skills, discuss developments in this area and problems related to specific areas which includes apical lesions and those associated with the dental hard tissues.

Keywords: Biopsy, various types of biopsies, exfoliative cytology

Introduction:

The term biopsy was coined by Ernst Henry, a French dermatologist in 1879. Biopsy is used for all tissues of the body, including those of the oral cavity, where a wide spectrum of disease processes may be present. Proper management of an oral mucosal lesion begins with diagnosis, and the best way for diagnosing disease, oral or otherwise, is tissue biopsy [1]. Biopsy not only help in the diagnosis but serves as a treatment option for smaller lesions by excising *in toto*, thus it helps in the treatment plan. An unsuitable, sample is of no use to the clinician but most importantly the patient who would be ill have to unnecessary repeat procedure. [2]

Dr. Rovin had made several observations on decisions in respect to biopsy [3]-

1. Any inflammatory lesion that does not respond to local treatment after 10 to 14 days, i.e., after the local irritant has been removed.
2. Any lesion that lasts more than two weeks and has no apparent etiological cause.
3. Persistent hyperkeratotic changes in surface tissues, as well as any visible or palpable tumescence beneath relatively normal tissue.
4. Lesions interfering with local function such as Fibroma.
5. Bone lesion that are not superficially identified by clinical or radiographic findings.
6. Any lesion that has characteristics of malignancy.
7. To ascertain the nature of a lesion that does not respond readily to conservative and simple therapy.
8. To make a diagnosis when there is a strong suspicion of neoplasia.
9. All abnormal tissue removed from the oral cavity, including cysts and granulomas, must be identified.

Various types of biopsies: -

- I. Incisional biopsy
- II. Excisional biopsy
- III. Exploratory biopsy
- IV. Curettage biopsy
- V. Punch biopsy
- VI. Unplanned biopsy
- VII. Needle biopsy

- VIII. Imprint cytology
- IX. Shave biopsy
- X. Exfoliative cytology

1. *Incisional biopsy:*

It is a technique which samples only a particular or representative part of a lesion. If the lesion is large or has different characteristics in different locations, it may be necessary to treat more than one area of the lesion. This technique is typically used when the area under investigation appears difficult to excise due to its large size (>1cm in diameter) or hazardous location, or when there is a suspicion of malignancy. **Fig.1 [4]**

Principles of incisional biopsy-

Selected areas of the lesion are biopsied in a wedge fashion. The site should be selected such a way that shows maximum tissue changes. Necrotic tissue is avoided. The material is taken from the edge of the lesion to include normal tissue. Adequate amount of abnormal tissue is taken. Deep, narrow biopsy is preferred than broad, shallow one due to superficial changes may be quite different from those deeper in the tissue.

In incisional biopsy an elliptical wedge is removed.

In order to join in deeper sub lesion tissue, the incisions on either side of the ellipse converge in a V. Except for pigmented or vascular lesions, rapidly growing lesions with ill-defined borders, which require margins of 5mm normal tissue, a margin of normal tissue of at least 2- 3mm is required in either case. In all of these cases, the length of the ellipse should be three times the width to aid in tissue closure and reduce the possibility of wound dehiscence.

2. *Excisional biopsy:*

This type of biopsy is performed for small oral lesions, usually less than 1 cm in diameter. On clinical examination, the lesion appears to be benign. This type of biopsy results in complete removal of the lesion.[5]

Principles of excisional biopsy-

The entire lesion along with 2-3mm of normal appearing surrounding tissue is excised. **Fig.1**

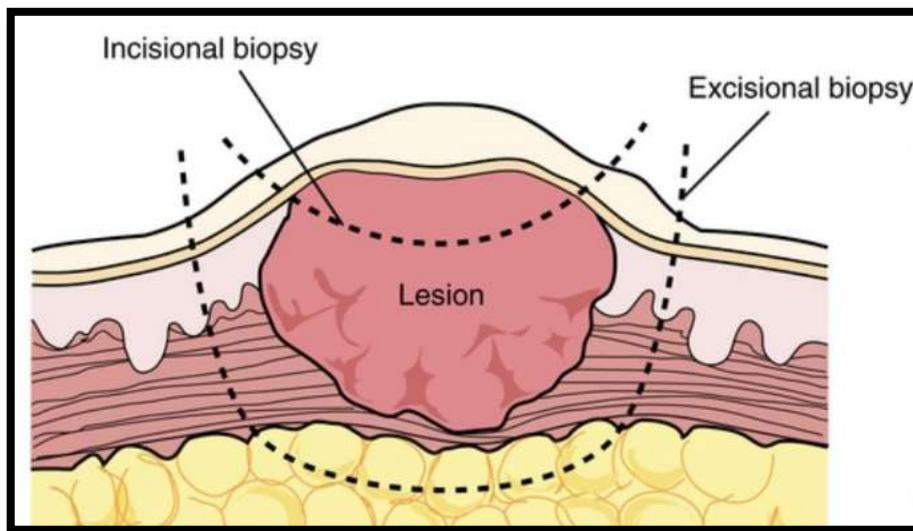


Fig.1: Diagram illustrating the surrounding tissue excision for Incisional and Excisional Biopsy (16)

3. *Exploratory biopsy:*

This biopsy is used for investigation of an internal lesion and removal of all portions of tissue exposed is done. This is mostly used in intra osseous lesion of maxilla and mandible.[6]

4. *Curettage biopsy:*

It is primarily used to evaluate intraosseous lesions and very friable cellular lesions where only small amounts of surface material are required.

The sedimentary segments of extremely small tissues are placed in agar media and sectioned as tissue blocks after being centrifuged. This is effective on lesions such as actinic keratosis, superficial squamous cell carcinoma, superficial basal cell carcinoma, and warts, but it is ineffective on inflammatory dermatoses and pigmented lesions.[7]

5. *Punch biopsy:*

This biopsy is done with a punch tool for both incisional and excisional purposes. This type of biopsy is best suited for the diagnosis of oral manifestations of mucocutaneous and ulcerative conditions of the oral cavity, such as lichen planus.[8]

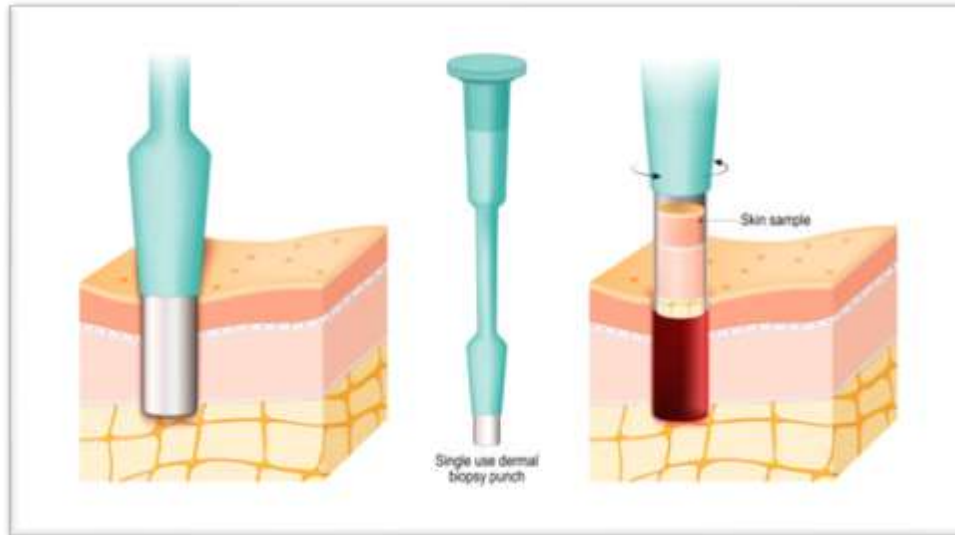


Fig.2: Diagram showing removal of skin sample by using single dermal biopsy punch (17)

Principles of punch biopsy-

The punch is held perpendicular to the skin and gently rotated with firm downward pressure in this method. The punch is pushed down until it reaches the subcutaneous fat. The pedicle is cut after lifting the incised column of tissue in the punch. The punch is then carefully removed from the tissue. **fig.3** [9]

6. *Unplanned biopsy:*

It is the result of an unexpectedly obtained suspicious tissue during a surgical procedure.

7. *Needle biopsy:*

There are two types of needle biopsy-

a) Fine needle biopsy (also called fine needle aspiration)

In this 12 or 16- gauge needles with a trocar are used to obtain cores of tissue. Such tissues are examined by routine histological methods.[10]

b) Core needle biopsy (also called core biopsy)

Needles used in a core needle biopsy are slightly larger than those used in FNA. They remove a small cylindrical tissue about 1/16 inch in diameter and 1/2 inch long. The core needle biopsy is done with local anesthesia in the doctor's office or clinic. Like FNA, a core needle biopsy can sample tumors that the doctor can feel as well as smaller ones that must be seen using imaging tests.[11]

8. *Imprint cytology:*

In this technique, the biopsied tissue is cut in half, the cut surface is touched to the slide, and the slide is stained later to reveal the exfoliated cells.[12]

9. Shave biopsy:

When a lesion is raised, a shave biopsy can be obtained for selected lesions using either a scalp blade or a double edge razor blade, and the lesion is cut fresh with the blade.

Excessive traction on an exophytic lesion's surrounding skin must be avoided, as this may result in permanent depression at the biopsy site. This technique yields shallower specimens, and wounds often heal with fewer visible cosmetic defects. **Fig 4.** [13]

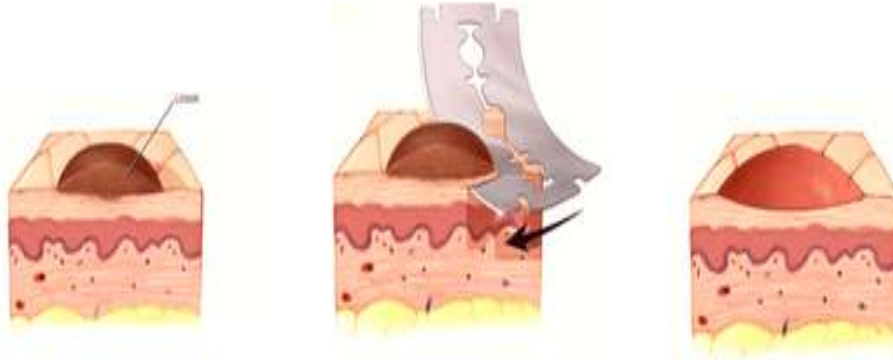


Fig 3. Diagram showing removal of a thin tissue using double sided blade for shave biopsy (18)

10. Exfoliative cytology:

Exfoliative cytology is the microscopic examination of cells obtained from the surface of a lesion or organ after the suitable staining.[14]

Principles of exfoliative cytology-

First, the entire surface of the lesion is cleaned by removing all debris, mucins, and so on. Following that, the lesion's surface is gently scraped several times with a metal cement spatula or a moistened tongue blade. As a result, the materials on the lesion's surface adhere to or collect at the instrument's border. The material is then evenly spread over a microscopic slide and immediately fixed with 95% alcohol. The slide is then air dried before being stained with a special stain known as PAP stain (Papanicolaou stain).[15]

CONCLUSION-

A biopsy is a simple procedure with high diagnostic value. Knowledge of the practical aspects of this technique, as well as awareness of complications arising from biopsy and their management, can help an oral pathologist get a diagnosis or provide new and more information about the disease in his clinical practise.

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