

Short Communication

Biopsy: Clinical implications

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Biopsy is an important surgical procedure done for the accurate diagnosis of many mucosal lesions. Thus, it is essential for every dentist to know its implications. This article explains the indications, contraindications and several points to be followed during biopsy procedure and the transportation of the specimen to the histopathological laboratory. Knowing these points would help to avoid the unnecessary delay, wrong diagnosis and will improve the understanding between the clinician and the pathologist.

Key words: Biopsy, oral biopsy, considerations in biopsy.

INTRODUCTION

As the dental profession moves towards automation and sophistication, it needs the use of number of diagnostic tools, one among them is biopsy: Bio=life, ophis=vision.

Biopsy is the removal of the tissue from the living organism for the purpose of microscopic examination and diagnosis (Shafer et al., 1983). The WHO in 1966 defined "biopsy as the examination of tissue removed from a lesion and by extension the term is also used to convey the removal of the tissue".

Though this is a basic subject, the information available in the books is inadequate and not comprehensive. Thus, this attempt is made, to present the points to be remembered in the dental practice, for the proper obtaining and transport of the biopsy to the laboratory.

Objectives of biopsy are:

1. Biopsy is done to confirm the clinical and radiographic findings
2. It is also valuable in determining the type of the treatment to be instituted in certain diseases
3. It is valuable self teaching, diagnostic aid

4. For patients who have cancerophobia, the histopathological examination provides a means of eliminating the phobia

5. Biopsy reports are used as medicolegal records if need arises

Indications for biopsy are:

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. Inflammatory changes of unknown cause that persists for long periods
6. Lesions that interfere with function
7. Any tissue surgically excised
8. Any tissue spontaneously expelled from a body orifice
9. Material from a persistent draining sinus whose source cannot be readily identified

Contraindications are:

1. When the general health condition of the patient is very

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poor

2. When acute, virulent, pyogenic infection is present

Any qualified dentist who has the skill and confidence can perform simple biopsy procedures. Sometime, the procedure of biopsy can pose problems because of the anatomic site, nature of the lesion etc. The lesions on the tongue, inner lip, buccal mucosa, alveolar mucosa are easily biopsied, whereas, the lesions on the floor of the mouth, soft palate, external portions of the lip can present surgical problems. Lesions of vascular origin or conditions of blood dyscrasias etc., complicated situations may be referred to oral surgeons.

The small lesions, usually less than 2 cm in size are subjected for excisional biopsy, where, the lesion is removed entirely with surrounding margin of the normal tissue, applicable to papillomas, fibromas, granulomas etc (Harahap, 1989). It is better to perform the excision of pigmented and vascular lesions. For larger lesions incisional biopsy is performed, where the most representative site is biopsied and sent for histopathological examination. There are various techniques to perform the biopsy procedure. Scalpel, punch biopsy, curettage, drill, trephination etc technique are available, which may be used depending on the clinical situation.

Some studies have shown that the artifacts of the incisional biopsy can be minimized by using the punch biopsy technique (Lynch et al., 1990). Some clinicians feel punch generates less anxiety than the conventional scalpel (Eisen, 1992).

There are certain points one should consider while performing oral biopsies. They are discussed here. The tissue should be representative of the whole lesion. Adequate amount of tissue must be removed for biopsy. Excised tissue shrinks while processing, so the excised specimen should be at least 1×0.5 cm in size for the proper histopathological interpretation. For the pathologist, the whole lesion provides the best sample. Whenever possible attempts should be made to remove the entire lesion. In case of large lesions, the specimen should be removed from the most easily accessible area and from an area that represents the characteristic of the lesion. For multiple lesions, the most representative site is selected or multiple areas should be biopsied. If the lesion is extensive, different samples should be obtained placing each of them in a separate and adequately identified container, schematic representation of the lesion and site of biopsy should be sent along with the case history. Fine Needle Aspiration Cytology is useful for lesions of salivary glands, lymph nodes and cystic lesions. For lymph node pathologies, thorough clinical examination and laboratory investigations need to be performed prior to biopsy. If biopsy is indicated, the entire lymph node is surgically removed (Mota-Ramiraz et al., 2007). If the lesion is intraosseous, the cortical plate should be removed and along with the material curetted from the

the interior of the lesion should be submitted for the examination. A biopsy of skin or mucosa should include a representative sample of both epithelium and connective tissue components. If the lesion is an ulcer, the tissue in the biopsy should include the ulcer margin where normality is passing into ulcer. A piece of deep part of the ulcer should also be included. If the lesion has areas of varying appearance, more than one biopsy should be provided and site of maximal clinical activity should be included. For generalized gingival lesions, the interdental papilla should be selected for biopsy. This area which includes the different types of gingivae shows the early manifestations of several conditions. The design of biopsy depends on the area in which the changes have to be observed. For surface phenomenon such as Pemphigus, it is better to provide longer, broader shallower biopsy specimen than a deeper, narrow specimen which is preferred in connective tissue pathologies. However, one should avoid biopsies of only ulcerative, necrotic areas as these are non specific histologically and rarely useful for the diagnosis. When it is required for the clinician to know whether the margins of the lesion are free of the disease, the operator should clearly indicate this to the pathologist either by tagging the margins with sutures and notifying the pathologist. Clinician can also inform the pathologist that the biopsy should be examined for the margins along with the clinical data sheet, so that, the pathologist can stain the margins before processing.

If the biopsy is done to study the histopathology of pulp, after extraction of the tooth, it should be fixed immediately. It is required to make an opening on the crown or to cut at the apical third to facilitate the penetration of the fixative into the pulp chamber.

The bone and the dental hard tissues require decalcification before the routine tissue processing. The time for the decalcification will vary according to the size and the consistency of the specimen. It can be matter of weeks too (Oliver et al., 2004).

There are certain points to remember when performing the biopsy:

1. Preparation of the tissue: During the preparation of the tissue for biopsy, one should not paint the surface with colored antiseptic like iodine. This leads to the pigmentation of the section leading to faulty interpretation

2. Local anesthesia: While injecting the local anesthesia, one should be careful not to inject the solution into the lesion or close to it. Whenever possible it would be better to give block injections instead of infiltrations. Injection of large amount of solution into the area to be biopsied may produce two major tissue changes:

- (i) The needle insertion may produce hemorrhage with extravasation which masks the cellular architecture.

- (ii) In addition, separation of the connective tissue bands with vacuolization can occur.

3. Handling of the tissue: The tissue should be handled with minimal force. When excessive force is used in removal of the tissue, the specimen may get distorted and become useless in formulating an accurate diagnosis.

4. Use of forceps: As far as possible using the forceps on the surface of the biopsy should be avoided. When the teeth of these instruments penetrate the specimen, it results in voids or tears and compression of the surrounding tissue. The surface epithelium may be forced through the connective tissue (Margarone et al., 1985; Ficarra et al., 1987). So, small atraumatic forceps only should be used cautiously. Touching the surface with forceps should be avoided. Sutures can be placed which will help in handling the tissue as well as to give tension for the tissue, to ease the surgery.

5. Use of electrocautery: It is observed that the heat from electrocautery produces marked alteration in both the epithelium and the connective tissue. Care must be taken to use the cutting and not the coagulation electrode when obtaining a biopsy specimen, so that, low milliamperage current will be produced that will allow cutting and liberation of the specimen. Those lesions where the margins should be examined, electrocautery is contraindicated. The combination of electrocautery and a scalpel should be considered. Scalpel should be used for the initial incision around or into the lesion to be biopsied and electrosurgery to complete the removal of the specimen.

6. Orientation of the tissue: majority of the mucosal lesions are epithelial in origin. Correct orientation of the biopsy specimen, that is, perpendicular to its cut surface will enable the pathologist to view the epithelium and the connective tissue. In case of flat lesions, ulcerated, bloody or thin epithelial surfaces it becomes very difficult for the pathologist to identify epithelium and connective tissue because both of these tissues can become dark after formalin fixation. Improper orientation will lead to the sectioning of either epithelium or the connective tissue alone but not both. Hence it is required to identify the proper orientation after removal of the tissue. Clinician can do this by:

(i) Labeling the top and bottom sides by suturing through and through of the tissue

(ii) Clearly mention the dimensions when there is sufficient difference between top and bottom sides (iii) Using Indian ink to label the sides.

7. Fixation: The fixative should be selected depending on the purpose and method of tissue processing. For routine histological reporting, 10% neutral buffered formalin is used (Bancroft et al., 2002). For electron microscopic preparations, combination of glutaraldehyde and formaldehyde is used. In certain cases, for the purpose of immunostaining, frozen sections have to be prepared. For the immunofluorescence studies, especially of skin lesions, the biopsy can be stored in Michel's solutions till

it reaches the laboratory. If the fixation of the pulp is required, the apical third of the root may be cut to facilitate the flow of the fixative into the root canal. An opening can also be in the crown wherever possible. Fixative should be kept ready near the surgical table. Fixative should be in a wide mouth clear bottle. The purpose is to facilitate the introduction of the tissue into the fixative. The dark colored bottles should be avoided as we cannot see whether the tissue is into the fixative. When the clinician introduces the tissue into the fixative care must be taken to avoid the curling of the tissue. This can be prevented by keeping the tissue on a cardboard or blotting paper in the same orientation as *IN VIVO*, then slowly introduce the paper along with the specimen into the fixative. After introducing the tissue into the fixative bottle, one should check tissue to confirm that it is immersed in the fixative. By pouring the fixative onto the tissue, chances of tissue getting adherent to the bottle is more, so it should be avoided. The fixative should be at least 10 times the volume of the biopsy.

8. Labelling of the biopsy: Correct labeling should be done immediately. Patient's name, age, sex, hospital number should be entered in the label and clinical sheet to avoid wrong identity.

9. Transport of the biopsy: The fixative bottle should be properly sealed and sent to the histopathology laboratory. The tissues for frozen sections can be transported either in liquid nitrogen flasks or in Michel's solution.

10. Providing the clinical data: The final consideration in the submission of biopsy material is the adequately filled in history sheet. A detailed clinical data, photographs of the lesion, radiographs, reports of other laboratory investigations if available also should be submitted along with the biopsy specimen.

To conclude, these are some points, if observed clinically, the dentist can render invaluable service to his patients with early detection and diagnosis of the disease.

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