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BIOPSY- AN OVERVIEW

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ABSTRACT

Proper management of an oral mucosal lesion begins with diagnosis, and the gold standard for diagnosing disease, oral or otherwise, is tissue biopsy. Oral tissue biopsy may be necessary for lesions that cannot be diagnosed on the basis of the history and clinical findings alone. Accurate diagnosis of premalignant or malignant oral lesions depends on the quality of the biopsy, adequate clinical information and correct interpretation of the biopsy results. This article provides an overview of the oral soft-tissue biopsy and highlights some potential pitfalls.

KEYWORDS: Biopsy, Incisional, Excisional.

INTRODUCTION

Biopsy, a Greek-derived word (bio-life; opsia-to see) loosely translated as "view of the living," is defined as removal of tissue from the living organisms for the purpose of microscopic examination and diagnosis. The term "Biopsy" was introduced into medical terminology in 1879 by Ernest Besnier.[1] Biopsy is often the definitive procedure that provides tissue for microscopic analysis when additional information is required to guide any indicated therapy.[2] The dental clinician should be aware of the various biopsy techniques that are available for the oral tissues, as well as the challenges specific to these tissues.

The main objective of biopsy is for confirmation of clinical and radiographic diagnosis, surgical management and to determine the complete removal of a lesion.[3] It is also valuable in determining the type of the treatment to be instituted in certain diseases. Biopsy reports are also used as medicolegal records if need arises.[4]

Indications

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 for more than 2 weeks despite removal of local irritants and shows no response to treatment.[3,4,5] Any tissue surgically excised, Any tissue spontaneously expelled from a body orifice, Material from a persistent draining sinus whose source cannot be readily identified.[4] A biopsy is also used as complement in the diagnosis of certain disorders of infectious origin, such as lesions of syphilis or tuberculosis. Another indication for biopsy is confirmation of the diagnosis of certain vesiculobullous lesions.[3]

Bony lesions accompanied by pain, paresthesia or other symptoms, rapid expansion as evidenced by successive radiological evaluations. Lesions with rapid bone loss, irregular widening of the periodontal ligament, spiking root resorption and tooth mobility in the absence of trauma or an identifiable source of inflammation are also indicated for biopsy.[3]

Contraindications

Biopsy is contraindicated when the general health condition of the patient is very poor, presence of acute, virulent, pyogenic infection, vascular lesions where significant hemorrhage may be encountered and caution should therefore be exercised in the biopsy of any lesion with red, purple or blue coloration or with blanching or pulsation on palpation.[4,6]

Biopsy is not advised in the case of multiple neurofibromas due to the risk of neurosarcomatous transformation, or in tumors of the greater salivary glands. Such biopsies must be performed by specialized surgeons in order to avoid damaging the nearby anatomical structures and causing the spread of tumor cells, as this would adversely affect the prognosis.[7]

Site of Biopsy

The biopsy site must be selected carefully to ensure that it yields accurate results. In case of large ulceroproliferative lesion there may be some areas which demonstrate obvious invasive disease, while others may indicate epithelial dysplasia. For such lesions, multiple specimens must be taken. Using toluidine blue or direct fluorescence visualization can help a clinician highlight the most severe or significant change for biopsy.[8] Excisional biopsy is usually advised for the smaller lesions.[3,4] Areas near to teeth, bone or cartilage should be avoided if possible because this is where tumor invasion is less and are frequently sites of necrosis.[3]

Types of biopsy

Incisional biopsy: Incisional biopsy provides a representative sample of tissue for diagnostic purposes. It is the method of choice when the differential diagnosis includes malignancy. Its accuracy is relative, since by nature it does not allow study of the entire lesion. The technique used for incisional biopsy is usually straightforward, An elliptical incision, with a length-to-width ratio of 3:1, is made with a size 15 scalpel blade. The elliptical shape facilitates primary-intention closure. The inferior incision is made first, so that hemorrhage does not obscure the surgical field. The anterior tip of the ellipse is gently lifted with tissue forceps, and the base is severed.[9]

Excisional biopsy: is the complete removal of a lesion for functional and aesthetic purposes, as well as to confirm the clinical diagnosis. This is appropriate only if the lesion is almost certainly benign. The size, accessibility and regional anatomy of the lesion must all be considered. Small, pedunculated, exophytic lesions in accessible areas are excellent candidates for excisional biopsy. An ellipse is traced around the lesion, with the blade angled toward the centre of the lesion. This produces a wedge-shaped specimen that is deepest under the centre of the lesion and leaves a wound that is simple to close.[5,9]

Punch Biopsy: Is used for either incisional biopsy or excision of a small lesion at an accessible site. The lateral tongue and buccal mucosa are appropriate sites for punch biopsy, as it must be feasible for the device to approach the mucosal surface perpendicularly. The punch is placed on the lesional tissue, and a downward, twisting motion is applied. The tissue core is then severed at the base with curved scissors.[5]

Punch biopsy is not appropriate for vesiculobullous diseases, as the twisting action would detach the epithelium and prevent proper assessment of the interface between epithelium and connective tissue that is necessary for subclassification of such lesions.[5]

Electrosurgery and Laser Techniques: These techniques produce thermal artifacts that may hamper histologic interpretation; accordingly, these methods should be used with caution for diagnostic biopsy or when information from the margins is required. A laser produces a zone of thermal coagulation smaller than that of electrosurgery, but still, a 0.5-mm margin should be maintained between the cut and the representative area to be sampled.[5]

Brush biopsy: Brush biopsy has been advocated as a screening modality for lesions that may otherwise not be sampled. A stiff brush is used to collect cells from all epithelial layers through application of firm pressure with a rotational movement. Pinpoint bleeding indicates sufficient depth of cell collection. The sample is then transferred to a glass slide and sent to the laboratory for analysis. If atypical cells are found, conventional biopsy is also required.[5]

Biopsy procedure

Obtaining adequate and appropriate tissue sample is very important for the diagnosis purpose. An ideal mucosal biopsy should be of sufficient depth to include the entire layer of epithelium and a portion of the underlying connective tissue.[3,4] Biopsies of the mucosa should be at least 3 mm in diameter. Since biopsies shrink after formalin fixation, punch biopsies 4 or 5 mm in diameter are recommended to ensure an adequate sample size. The depth should be at least 2 mm.[8]

Points to remember while taking a biopsy[4,9]

1. Use of antiseptic like iodine leads to the pigmentation of the section leading to faulty interpretation.
2. 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
3. The tissue should be handled with minimal force as the specimen may get distorted and become useless in formulating an accurate diagnosis.
4. 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.
5. Sutures can be placed which will help in handling the tissue as well as to give tension for the tissue, to ease the surgery.
6. It is observed that the heat from electrocautery produces marked alteration in both the epithelium and the connective tissue. Those lesions where the margins should be examined, electrocautery are contraindicated. The combination of electrocautery and a scalpel should be considered.

Fixation and Transport

Ensure the specimen is placed in an adequate volume of fixative, this should be at least ten times the volume of the specimen. Avoid the use of gauze to place the specimen onto as it merely absorbs the fixative and can make separation of the specimen from the gauze

difficult.[9] The fixative should be selected depending on the purpose and method of tissue processing. For routine histological reporting, 10% neutral buffered formalin is used. The tissues for frozen sections can be transported either in liquid nitrogen flasks or in Michel's solution.[10]

Correct labeling should be done immediately. The fixative bottle should be properly sealed and sent to the histopathology laboratory. 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.[4,5,9]

CONCLUSION

Accurate diagnosis by the oral pathologist depends on the 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 the oral biopsy indications and the surgical techniques and thus can render invaluable service to his patients with early detection and diagnosis of the disease.

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