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RESEARCH ARTICLE

Role of dental surgeons making an accurate diagnosis in dental practice

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Abstract

The biopsy procedure in dental office by dentist is still controversial. Few authors are warned against the biopsy procedure in dental clinics due to lack of training and knowledge. But biopsies should remain part of the treatment to get diagnosis and to plan up the treatment based on the diagnosis. This paper presents an updated view of biopsies.

Introduction

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 is the examination of tissue removed from a lesion and by extension the term is also used to convey the removal of the tissue". The word 'biopsy' has originated from the Greek words, 'bios' -life and 'opsis'- vision of life. [(1)]

Biopsy is a valuable aid in oral clinical diagnosis; it consists of obtaining a specimen of living tissue in order to study its structure, both macro and microscopically. This procedure makes it possible to confirm or deny a diagnosis, as well as to determine the nature and characteristics of the lesion and to establish a final diagnosis.[(2)]

The American Academy of Oral and Maxillofacial Pathology recommends that "all abnormal tissue be submitted promptly for microscopic evaluation and analysis". It is generally accepted that in most instances, microscopic or histopathological examination of tissue is the gold standard for the diagnosis of many lesions that present in the oral cavity. Furthermore, histological examination is important not only in diagnosis but also provide information on the clinical behaviour, and prognostic behaviour of the particular lesion. Biopsy is also directly impact on patient management. Hence, deciding whether a lesion needs to be biopsied is also an important clinical decision.

Despite the importance of the histological examination of tissue, general dental practitioners do not regularly submit specimens for examination. Suggested reasons for this include the clinician's perceptions of training deficits and the risk of diagnostic error. Also, the relative infrequency by which dentists encounter pathology compared to other oral/dental problems in general practice has been suggested to contribute to the lack of experience and confidence with respect to the management or further investigation of pathology.[(3)]

Within the literature it is suggested by many authors that general dental practitioners should have adequate training to undertake simple biopsy procedures of apparently clinically benign lesions. The fact that this does not necessarily occur may be due to many factors, most likely due to the relative infrequency of the clinical presentation of pathology in general dental practice. However, dentists should be cognizant of the occurrence of pathology in their patients and even if not undertaking investigative techniques themselves, they should understand the principles of

investigative techniques relating to oral pathology and have strategies in place so that diagnoses can be made in a timely manner.

Purpose of a biopsy:

For many health problems, a diagnosis is made by removing a piece of tissue for study in the pathology laboratory. The piece of tissue may be called the sample or specimen. The biopsy report describes what the pathologist finds out about the specimen.

- Biopsy is done to confirm the clinical and radiographic findings
- It is also valuable in determining the type of the treatment to be instituted in certain diseases
- It is valuable self teaching, diagnostic aid
- For patients who have cancerophobia, the histopathological examination provides a means of elimining the phobia
- Biopsy reports are used as medicolegal records if need arises.[4]

Indication of biopsy:

- Any lesion that persists for more than 2 weeks with no apparent etiologic basis
- Any inflammatory lesion that does not respond to local treatment after 10 to 14 days.
- Persistent hyperkeratotic changes in surface tissues.
- Any persistent tumor, suspected being neoplastic
- Inflammatory changes of unknown cause that persist for long periods
- Lesion that interfere with local function
- Any tissue surgically excised
- Any tissue spontaneously expelled from a body orifice.
- Material from a persistent draining sinus whose source can't be readily identified, together with some lining of the sinus.
- Bone lesions not specifically identified by clinical and radiographic findings
- Any lesion that has the characteristics of malignancy
- Any lesion suspected as neoplasm.[4]

Contraindication:

- When the general condition of the patient is very poor.
- Necrotic and pigmented areas
- An acute very virulent pyogenic infection of the lesion is present
- In cases where blood dyscrasias
- Vascular origin.

Obtaining the biopsy specimen:

- Surgery is used to remove part of the tumor or the entire tumor.
- A needle is used to withdraw tissue or fluid.
- An endoscope (a thin, lighted tube) is used to look at areas inside the body and remove cells or tissues.
- Scraping or smear from urine, cerebrospinal fluid (the fluid around the brain and spinal cord), sputum (mucus from the lungs), peritoneal (abdominal cavity) fluid, pleural (chest cavity) fluid, cervical/vaginal smears, and in fluid removed during a biopsy.

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Labrotary technique:

Tissue section: After the specimen is removed from the patient, it undergo in various stages and prepared as a histologic section. Histologic sections are very thin slices of the specimen that are stained, placed on a glass slide, and then covered with a thin piece of glass called a coverslip.

Smears. Smears are done when the specimen is a liquid or there are small, solid chunks suspended in liquid, which are "smeared" onto a slide. They are then allowed to dry or are fixed. The fixed smears are stained, covered with a coverslip, and then examined under a microscope.[5]

Biopsy report:
Biopsy reports are written in technical medical language.A pathologist is a doctor who examine the cells and tissues and writes the biopsy report. Biopsy reports play an important role in diagnosis, which helps determine treatment options.
A biopsy report describes the findings of a specimen. It contains the following information:

Patient information: Name, birth date, biopsy date

Gross description. A gross description is the obvious examination of the specimen which describes how it looks to the naked eye and where the biopsy was taken from. It may include a description of the colour, size, and texture of the specimen.
Microscopic examination. A microscopic examination is a description of what the findings of the slides showed under a microscope; it's usually technical and not in simple language.

Diagnosis. This is usually considered the "bottom line" and, although the format varies, often the diagnosis is expressed as: organ or tissue, site from which the biopsy was obtained, type of surgical procedure used to obtain the biopsy, followed by the diagnosis.

Tumor margins: There are three possible findings when the biopsy sample is the entire tumor:
- Positive margins mean that cancer cells are found at the edge of the material removed
- Negative, not involved, clear, or free margins mean that no cancer cells are found at the outer edge
- Close margins are neither negative nor positive

Remarks: Samples that have been sent for other tests like immunohistochemical (IHC) to or a second opinion

Other information: Pathologist's signature and name and address of the laboratory

Errors with biopsies
Despite the importance of submission of tissue for histological examination as an important investigative technique, there may occasionally be difficulties interpretation or biopsy reports may get delay due many reason [2,3]
- Improper tissue fixation.
- Improper tissue processing and preparations of sections of biopsy
- Samples that have been sent for other tests like immunohistochemical (IHC) or special stain to identify the origin of tumor/lesion.
- Sometime pathologist may take a second opinion from an expert. Many institutions provide second opinions on pathology specimens.
- A technical reason like certain tissues like bone/teeth takes longer time to process.
- Difficulty in interpretation of the histology due to be a lack of correlation between clinical signs and symptoms and the histological features observed
- Unrepresentative tissue samples are submitted for histological examination.
- Improper surgical technique/ biopsy sample

Biopsy of oral mucosal lesions/tumors
Franklin and Jones stated that *adequate* and *appropriate* collection of tissue is essential for accurate examination, diagnosis and ultimately treatment. Therefore, for dentists who undertake biopsy procedures, understanding what is adequate and appropriate is important.[6] According to Poh *et al.*, an *appropriate* biopsy should be dependent on three main factors, namely, selection of the biopsy site, the type of biopsy and finally the adequate submission of the specimen to the laboratory.[7]

The amount of tissue submitted is important. Whilst a biopsy does not necessarily have to be large, very small or superficial biopsies can be inadequate and not diagnostically useful – small biopsies can also be lost or become distorted during processing. It is important that there is an adequate amount of tissue for assessment. Finally, an accurate and relevant clinical description of the lesion can assist the pathologist in the diagnosis.[3]

If multiple smaller biopsies of the lesion may be appropriate in order to provide such representative tissue to the pathologist for examination.

Helping the pathologists

The various ways, by which the quality of a biopsy can be improved, has been discussed along with other measures to minimise a useless biopsy

- Obtaining an accurate history and clinical examination
- Providing other available diagnostic data such as the radiological findings, laboratory tests or any other special investigations like ultrasound or CT scan.
- Proper administration of local anaesthesia i.e not to inject the local anaesthesia directly into the lesion
- Not to apply any antiseptics/dye over lesion
- Correct handling of tissue sample with minimal force
- Specimen should be at least 1×0.5 cm in size for the proper histopathological interpretation.
- Sample should wash with saline followed by immediate fixation with fixative
- Fixation bottles should be securely closed with wide mouth bottle and labelled the patient details
- Fixative should be 10-15 times the volume of the biopsy
- Submission of sufficient tissue sampling
- Appropriate representative area of biopsy sample
- Different samples should be placed in separate and adequately identified containers.
- Correct labelling should be done immediately. Patient's name, age, sex, hospital number should be entered on the bottle label and clinical sheet to avoid wrong identity.
- Model diagrams of the lesions which specify the locations of the lesions should also be attached along with the biopsy requisition data sheet.
- Care should also be taken to prevent the contamination of the tissue
- Good cordial relation between clinician and pathologist to clear any doubts [1,8]

Medico-legal issues

Dentists have a clear professional obligation to diagnose and manage oral mucosal pathology or to appropriately refer. Once a biopsy has been taken there is a clear responsibility to note the result, inform the patient and take appropriate management steps. Failure to act, particularly with biopsies involving malignancy, has resulted in legal actions against the health professional.[3]

Conclusion

A biopsy is the removal of tissue in order to examine it for disease. The tissue samples can be taken from any part of the body. Patients often present with intraoral pathology in the general dental practice setting. Therefore, it is crucial that dental practitioners are aware of how to deal with pathology when it presents and have an understanding of investigative techniques that might assist in making a diagnosis. This is important irrespective of whether the dentist is the person actually undertaking the procedure or the investigation. If a referral is made to a specialist for biopsy, the referring practitioner still needs to be familiar with the procedures and results obtained so that the patient can be appropriately managed.

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