



Biopsy of the Oral Mucosa and Histological Assessment

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The word “biopsy”, from the Greek *Bios* (life) and *Opsis* (sight), was created by the French dermatologist Ernest Besnier in 1879 to designate procedures consisting of the removal of a fragment of living tissue to study its histological characteristics for diagnostic purposes.

Initially, the patient should be informed about the following points:

- The request for a biopsy does not mean suspicion of cancer.
- Biopsy is a relatively simple procedure that is usually performed under local anesthesia in the dental office. In children, general anesthesia may be needed.

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- The size and location from which the sample will be removed are important.
- The sample will be sent to an oral pathology laboratory, and the oral pathologist will perform a thorough analysis of the samples with the naked eye (macroscopy) and under the microscope (microscopy).

1 General Aspects

- The time to arrive at a diagnosis may vary. It is not an automated diagnosis printed quickly by a machine.
- The activity requires years of professional training, experience and study to interpret the cells and issue their opinion through a histopathological report.
- Chemical processes for tissue preservation and staining and cutting will be performed so that histological slides can be analyzed.
- The slides and the sample are safely stored for a certain period to aid in future treatments, prognostic information, or even scientific research.
- The oral pathologist usually correlates clinical data with microscopic analysis to determine the disease in question, contributing to the choice of the best treatment for the patient.
- In the oral and maxillofacial region, a biopsy is contraindicated in situations where:
 - The patient has complex systemic diseases.
 - The clinical diagnosis is sufficient.
 - The lesion regresses or disappears after 2 weeks of clinical follow-up.
 - The lesion shows a probable high-flow vascular origin.
 - The lesion is in the major salivary gland, producing an extraoral volume increase.
- Oral biopsies are indicated in situations where:
 - The lesion shows clinical features of malignancy.
 - The lesion without apparent etiology persists for more than 2 weeks.
 - The lesion of inflammatory origin does not respond to local treatment.
 - The lesion produces progressive growth in volume.
 - The lesion interferes with local function.
 - The intraosseous lesion cannot be diagnosed radiographically.
- There are two types of biopsies. The excisional biopsy (Fig. 1) consists of the total removal of the lesion, is usually indicated for clinically benign lesions, is pedunculated, and is smaller than 2 cm. An incisional biopsy consists of the removal of part of the lesion and is indicated mainly in lesions with suspected malignancy or larger than 2 cm.

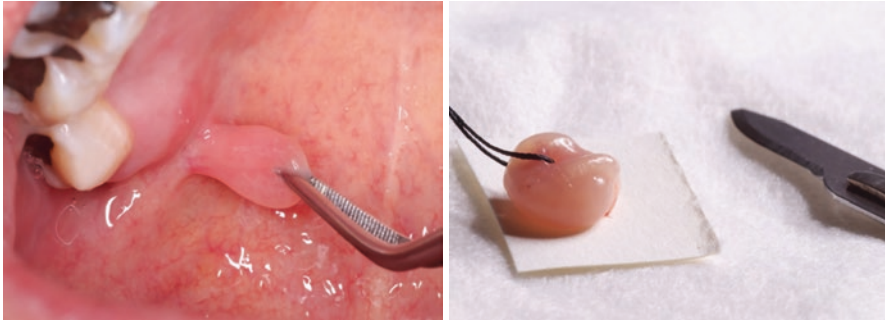


Fig. 1 Excisional biopsy of a pedunculated nodule smaller than 2 cm. Courtesy of Dr. Diego Tetzner Fernandes

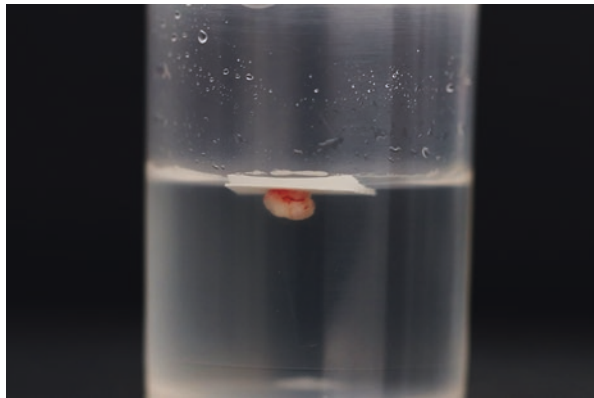
2 Instruments and Materials

- The materials usually used are gauze, suture thread, scalpel blade, short or long needle (selected according to the anesthetic technique of choice), surgical suction device, table and fenestrated drapes, focus protector, surgical gloves, chlorhexidine digluconate 0.12% (alcohol-free), and povidone-iodine (or 2% chlorhexidine) for extraoral antisepsis and saline solution.
- Instruments such as curettes, chisels, or motor-driven surgical burs should be used only in cases of intraosseous lesions. Every intraosseous lesion, should be submitted previously to exploratory aspiration to rule out the possibility of a vascular lesion, a situation in which biopsy in an ambulatory environment should be avoided.
- In the case of very small biopsies, it is suggested to place them on filter paper before introducing them into the vial. This procedure guarantees a better orientation of the fragments, facilitating their manipulation in the laboratory (Fig. 2).
- Biopsy container containing 10% buffered formaldehyde should be properly identified and sent to the oral pathology laboratory (Fig. 3). In cases of multiple lesions in different locations of the oral cavity, when removed, they should be packaged in different biopsy containers, which should be properly identified through a label containing the name of the patient and the location of the fragment removed.
- The arsenal to perform the biopsy and the choice of the most appropriate instrument is mainly related to the nature and location of the lesion and the experience of the professional.

Fig. 2 Small biopsy placed on filter paper before introducing them into the specimen container. Courtesy of Dr. Diego Tetzner Fernandes



Fig. 3 Fragment of soft tissue placed in a transparent specimen container with a volume of formalin 20 times the size of the sample. Courtesy of Dr. Diego Tetzner Fernandes



3 Guidelines

- Incisional biopsies are mandatory in the suspicion of malignant tumors.
- Make an incision that is preferably elliptical or wedge-shaped to facilitate suturing and deep enough to include enough tissue for analysis.
- Perilesional tissue has to be included to ensure the inclusion of healthy tissue in the analysis of vesiculobullous lesion samples.
- Involve multiple areas in heterogeneous lesions (with leukoplakia and erythroplakia areas, for example) because histological features may vary in these regions.
- Avoid areas of necrosis.
- Never split the sample to send to two different pathologists.
- Be careful when manipulating the tissues, avoiding traumatizing them with forceps and/or sucker (Figs. 4 and 5).

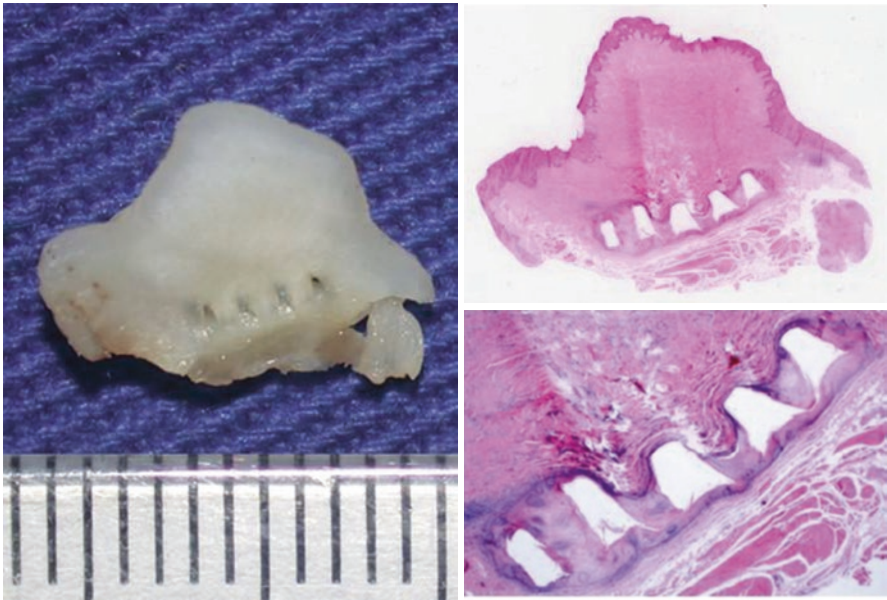


Fig. 4 Sample damaged by inappropriate use of the Allis forceps. Note that the base of the specimen was damaged by the shape of the forceps, resulting in a microscopic impression of epithelial tissue in the connective tissue depth

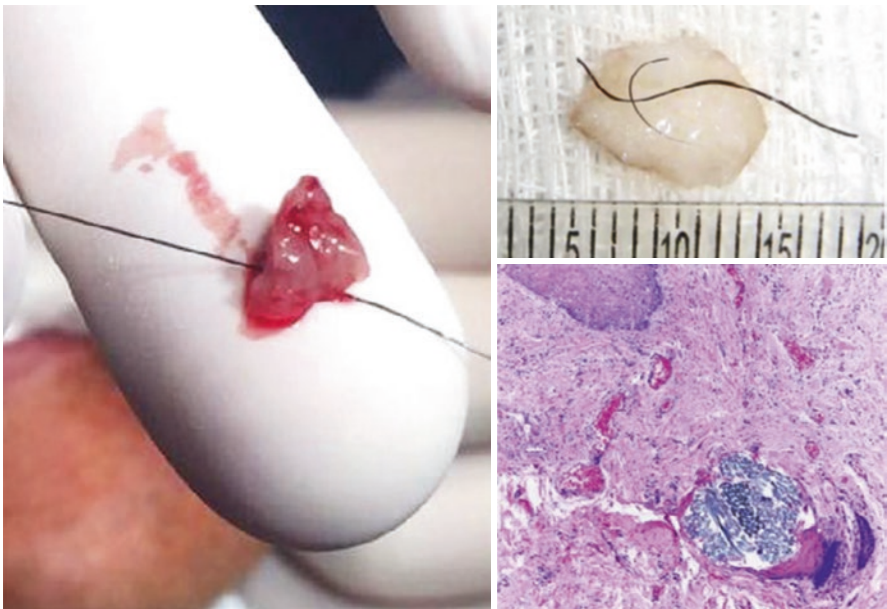


Fig. 5 Sample manipulated in the clinic with the aid of suture thread (left). The suture thread can be observed in the oral pathology laboratory (right) in the macroscopy (top) and microscopy (bottom) exams

4 Surgical Technique

- Place the tissue immediately into a sample container with a volume of formalin 20 times the size of the sample.
- Photographic documentation of the lesion (more details in Chap. 2) and election of the area to be removed.
- Preparation of the surgical field.
- Local anesthesia.
- Incision and manipulation of the removed sample (Fig. 6).
- Removal of excess blood with gauze without macerating the tissue.
- Suturing the surgical wound.

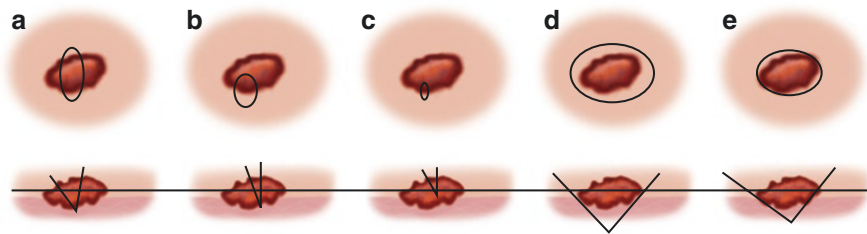


Fig. 6 Diagram showing different surgical approaches in a biopsy. **(a)** Correct incisional biopsy. **(b and c)** Incisional biopsy that will result in insufficient material. **(d)** Correct excisional biopsy. **(e)** Excisional biopsy in which the lesion was not completely removed

5 Bone Biopsy

Intraosseous lesions that do not allow a radiographic clinical diagnosis may also be submitted to incisional or excisional biopsy (Fig. 7). The decision will depend on the size of the lesion and the diagnostic hypotheses. After the evaluation of imaging exams (radiographs and computed tomography), the best surgical access is chosen (region of least resistance), followed by incision and detachment of soft tissues until the bone is exposed, proceeding with the removal of any remaining cortical bone (which should not be included in the same specimen container as the material to be examined) and collection of intraosseous pathological tissue, finishing with suture.

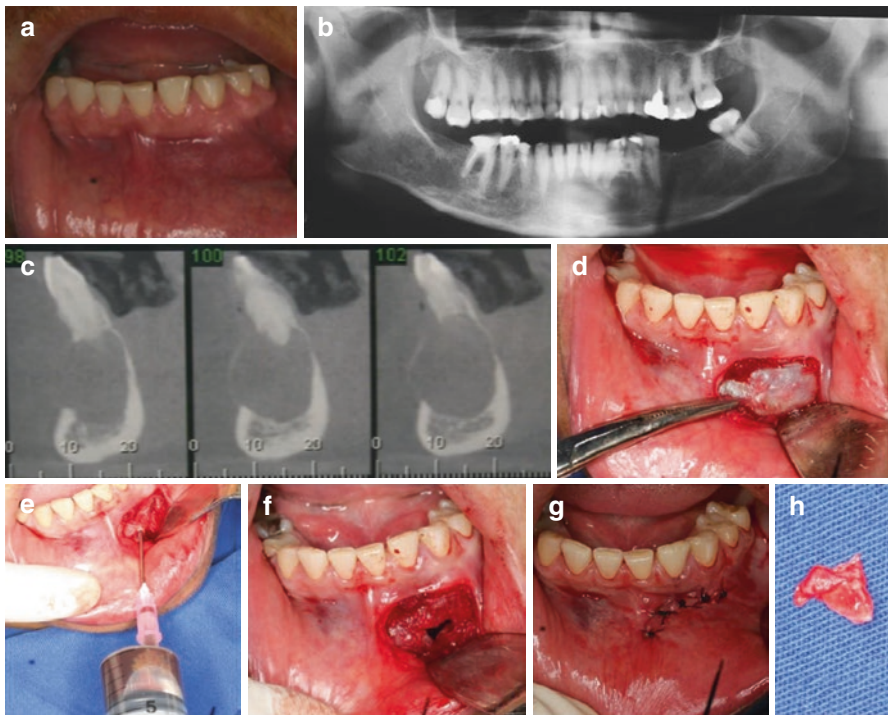


Fig. 7 (a) Volume increase in the anterior region of the mandible, (b) panoramic radiograph, radiolucent image extending from 35 to 43; (c) cone-beam computed tomography, the image of the osteolytic lesion, causing erosion of the buccal cortex; (d) incision and exposure of the lesion; (e) exploratory puncture; (f) removal of the lesion fragment (incisional biopsy); (g) suture of the mucosa; and (h) collected specimen

6 Information Shared with the Oral Pathologist

The oral medicinist or oral & maxillofacial surgeon must send the clinical information to the oral pathology laboratory, including at least the full name and date of birth of the patient, the description of the clinical and/or radiographic appearance of the lesion, the clinical hypotheses of diagnosis, and a brief medical history of the patient, including consumption of medication, alcohol, and tobacco. Sending clinical photos and radiographic exams contributes to a better clinicopathological correlation. The information can be sent in the histopathological exam request form along with the specimen container containing the sample or digitally by e-mail or smartphone apps.

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