

Intraosseous Lesions of the Jaws: Excisional or Incisional Biopsy? Algorithm for Decision Making

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Abstract

Intraosseous lesions of the jaws appear as a wide spectrum of pathologies with different clinical and histopathological characteristics, ranging from benign, aggressive or malignant lesions that have different management, directly influencing the function and aesthetics of patients; therefore, early diagnosis is of vital importance to prevent more invasive treatments and decrease morbidity rates. The type of biopsy technique to choose will depend on a series of pre-surgical considerations, starting from the clinical evaluation of the patient, complementary examinations and differential diagnoses. The objective of this review is to determine the clinical and imaging parameters in intraosseous pathologies of the jaws that could lead the surgeon to perform incisional or excisional biopsy, as well as to present an algorithm for decision-making.

Keywords: *Intraosseous Pathologies; Jaws; Incisional Biopsy; Excisional Biopsy; Management Algorithm*

Introduction

Intraosseous lesions of the jaws can be classified as odontogenic and non-odontogenic cysts, benign and malignant tumors, fibroosseous entities, infections, and reactive lesions [1]. Cancellous or cortical bone response to injury can be expressed through an osteolytic or osteoblastic event, therefore, most lesions within the maxillofacial complex can be classified as osteolytic (radiolucent), sclerotic (radiopaque) or mixed [2].

There are parameters to identify the growth pattern of an intraosseous lesion which provide indications of the biological activity of the pathology and provide guidance on the type of biopsy to be performed: the more defined the edge of a lesion, the lower its biological activity and the greater the probability of benignity. Benign intraosseous lesions present as painless, expansive entities with well-defined margins, slow growth and a sclerotic ring. In contrast, malignant lesions present rapid growth, painful symptoms, poorly defined edges, possible bone exposure, cortical destruction with invasion of adjacent structures and even pathological fractures [3,4].

The degree of resorption and remodeling differs in benign and malignant lesions and these characteristics, along with the location of the lesion, allow a diagnostic orientation. Often, heterogeneous areas and tissue parts from proliferatively active areas can be shown in the lesion, which are essential for a representative biopsy and should be the target of proper planning [2,5].

Successful management of oral lesions generally follows a standard protocol, starting with a medical history and a detailed physical examination, followed by imaging and histopathological studies in order to obtain an accurate diagnosis and ideal surgical planning. The information provided by the patient on the behavior of the lesion and its imaging characteristics may not be conclusive when it comes to its evaluation, however, they constitute a tool that allows us to clarify the possible differential diagnoses that will lead to the management decision regarding the type of biopsy technique to consider [5].

Different imaging studies modalities are essential for the pathologist to interpret the histopathological appearance of each lesion. Many of these lesions share a similar radiographic appearance, which can make it difficult to distinguish between them. Nevertheless, when evaluating lesions in the maxillo-mandibular complex, the appearance, density and margins of the lesion, the anatomical location and relationship with adjacent structures, as well as the integrity of the cortical plates must be taken into account [6].

Incisional and excisional biopsy

As for the collection of the tissue to be studied, it can be obtained mainly through an incisional or excisional biopsy. Incisional biopsy is an intralesional procedure where a portion of the lesion is obtained, while excisional biopsy can achieve marginal or even extensive resection of the lesion. Biopsy should be carefully planned according to the location, size of the lesion, and diagnostic suspi-

cion; since definitive surgery, without prior planning, could dramatically reduce possible treatment options [5].

Incisional biopsy continues to be, within its indications, the gold standard and a reliable way of evaluating maxillofacial lesions at first instance with a diagnostic certainty of 91 - 96% [4] however, this technique has a series of limitations associated with the taking of the sample; among these, insufficient tissue for diagnosis and the presence of inflammatory tissue leading to potential errors in sampling, creating discrepancies in the interpretation of the image. The final diagnosis of an intraosseous lesion is only possible through a histopathological examination of the tissue removed in an adequate and representative way, reducing sampling error and its correct correlation with imaging studies [4,7].

The surgeon’s discussion about whether to remove the entire lesion or take a sample for an incisional biopsy is common, but in some cases the decision may be direct. Marx, *et al.* [8] proposed that if the differential diagnosis includes realistic possibilities that the lesion is treatable by excision or local enucleation, an excisional biopsy is recommended. If, on the other hand, the more realistic possibilities of differential diagnoses include a mixture of lesions that are normally managed with different treatments or degrees of surgery, an incisional biopsy is recommended to obtain a definite diagnosis and establish proper treatment.

Chen, *et al.* [5] analyzed the precision of incisional biopsies in intraosseous lesions, estimating a diagnostic accuracy rate of incisional biopsy in benign intraosseous lesions of 70%. In this way, incisional biopsy constitutes the ideal and mandatory surgical technique against those lesions with benign but locally aggressive clinical and imaging characteristics or lesions with suspected malignancy, taking into account the importance of taking a representative sample, avoiding ulcerated or necrotic areas that may compromise the histopathological diagnosis.

Likewise, it is important to perform prior aspiration of intraosseous lesions to evaluate the characteristics of the content, air bubbles, liquid or serous fluids, and their characteristics such as color; since this is indicative of different pathologies. It is also important to rule out the presence of blood content that could lead to complications during the intraoperative period [8]. Aspirations can guide the diagnosis but are not definitive. Its application should be planned the same day as the incisional biopsy, to avoid subsequent inflammatory processes that may mask the histopathological characteristics of the intraosseous lesion. Although this topic is con-

troversial among clinicians, there is literature that supports performing a histopathological study of the aspirate content instead of performing an incisional biopsy; such procedure requires a lot of experience on the part of the pathologist to make an accurate diagnosis of intraosseous lesions [8,9].

As part of the management of this type of lesions in the Oral and Maxillofacial Surgery Unit of the University Hospital of Maracaibo - Venezuela, a complete anamnesis of the patient is performed including: age, gender, pathological history, evolution time, symptoms, among others. Similarly, a clinical examination is performed, where possible facial asymmetries as well as palpable lymphadenopathy are evaluated. Intraorally, the presence or absence of cortical expansion, mobility of dental organs associated with the lesion, consistency on palpation and its surface are observed. Once these data have been obtained, in the first instance, panoramic radiographic imaging studies are requested, in search of imaging characteristics that can guide the set of differential diagnoses that will be corroborated through the histopathological study (Figure 1).

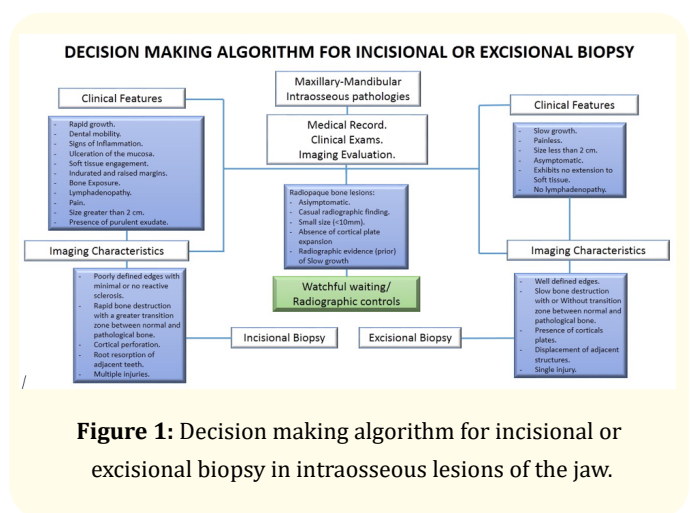


Figure 1: Decision making algorithm for incisional or excisional biopsy in intraosseous lesions of the jaw.

Regarding the type of technique to consider, we indicate incisional biopsy when these characteristics are present:

- a. Lesions of more than 2 cm.
- b. When differential diagnoses of aggressive lesions are established, even if they are benign, or malignancy is suspected.
- c. Lesions that clinically present rapid growth, mobility of associated teeth, with ulcerated areas and/or necrosis.

- d. Lesions with irregular and diffuse edges, with destruction of cortical plates and invasion of adjacent tissues.
- e. When injuries of infectious origin are suspected, this will warrant definitive non-surgical treatment.

During sampling under the incisional technique, it is important to obtain sufficient tissue from the lesion at an adequate depth, including edges of the lesion with healthy tissue, according to the established differential diagnoses, selecting an area that is not ulcerated, inflamed or necrotic. In this sense, if an extraction is to be performed, the tissue close to the tooth should be avoided, since it is a potential area of inflammation and will not represent a true area of the lesion.

As part of our protocol, in cystic-like lesions greater than 4 cm where there is no evidence of cortical involvement in a tomographic study, during this first surgical intervention a decompression protocol is considered, seeking to reduce the size of the lesions and then proceed to complete enucleation in a second surgical period, reducing the patient morbidity and in some cases preserving the dental organs associated with the lesion. Cases are carefully selected considering various factors such as the age of the patient, the type of lesion, the time of evolution and patient's compliance. One of the main indications for the use of this protocol are those lesions that are adjacent to vital structures, such as the mandibular canal and maxillary sinuses [10,11].

Our technique consists of making a full-thickness flap and a bone window, through which the sample that is sent for histopathological study is taken. Then, a perforated polypropylene drain of approximately 2 cm in length, depending on the size of the lesion, is placed inside the cystic cavity. This is fixed to the adjacent tissue using non-absorbable 3-0 silk suture; a 0.9% physiological solution or NaHCO₃ solution must be irrigated by the patient inside the drain twice daily. Radiographic control is performed monthly, preferably in the same radio-diagnosis center to reduce the risk of errors in the assessment of the involution of the lesion during the follow-up.

For an excisional biopsy of intraosseous lesions we take into account:

- a. Lesions less than 2 cm that do not present alterations in the associated oral mucosa, and the differential diagnoses are benign.

- b. Lesions where cortical plates are preserved.
- c. Lesions with a good cleavage plane, which also, due to their location and size, facilitate their complete enucleation in a single surgical time.

Radiopaque images of a size between 5 mm to 10 mm associated with the root of a tooth, showing patterns of slow and painless growth and which are incidental findings confined to bone marrow tissue without cortical involvement in imaging studies such as computed tomography, an expectant behavior is recommended, with periodic evaluations every 6 months.

Conclusion

The decision of an incisional or excisional biopsy for intraosseous lesions continues to be a challenge for oral and maxillofacial surgeons. It is important to correlate the patient's medical history, clinical and imaging findings that allow the best decision to be made for a correct diagnosis and management. Incisional biopsy continues to be a reliable technique for diagnosing such pathologies, especially large lesions, with aggressive behavior or suspicion of malignancy. However, under certain conditions, it is possible to consider performing excisional biopsies or periodic controls, based on the epidemiology, behavior and characteristics of some intraosseous lesions. The management algorithm hereby presented pretends to aid surgeons, especially novel ones, in the decision regarding the choice of the type of biopsy technique to perform.

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Declarations of Interest

None.

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