ARTIGO

ODONTOMA - DIAGNOSTIC CRITERIA AND TREATMENT: LITERATURE REVIEW

ODONTOMA - CRITÉRIOS DE DIAGNÓSTICO E TRATAMENTO: REVISÃO DE LITERATURA

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ABSTRACT: Introduction: Odontoma, or harmatoma, is one of the most common benign odontogenic anomalies affecting individuals in the first two decades of life, sometimes later. As for etiology, the literature reports that
trauma, infection, or genetic alterations may be involved. Diagnosis is made through routine imaging exams and the findings can be classified as compound or complex odontomas. The treatment is surgical and may include orthodontics and endodontics as co-participants. Objective: To establish criteria for the diagnosis and treatment of this pathology, which is of great relevance to general practitioners and other related areas. Methodology: The criteria for diagnosis and treatment of this pathology, obtained in the light of the scientific knowledge available in the various nationally and internationally recognized scientific media, are discussed here. Conclusion: It can therefore be concluded that the semiotechnique involved, the early diagnosis involved both locally and structurally, as well as the treatment plan often involving inter- and multidisciplinarity, will decisively result in a favorable prognosis provided that all the criteria in the scientific bases compiled here are met.

**KEYWORDS:** Oral Surgery, Pathology, Tomography.

**RESUMO:** Introdução: O odontoma ou harmatoma, é uma das anomalias odontogênicas benignas mais comuns que acometem indivíduos nas duas primeiras décadas de vida, algumas vezes mais tardiamente. Quanto à etiologia, a literatura relata que traumas, infecções ou alterações genéticas podem estar envolvidos. O diagnóstico é feito através de exames de imagem de rotina e os achados podem ser classificados em odontoma do tipo composto ou complexo. O tratamento é cirúrgico, podendo ter a ortodontia e a endodontia como coparticipantes. Objetivo: Estabelecer critérios de diagnóstico e tratamento desta patologia de grande relevância para o clínico geral e outras áreas conexas. Metodologia: Abordamos aqui, os critérios de diagnóstico e tratamento desta patologia, obtidos à luz dos conhecimentos científicos disponibilizados nos diversos meios científicos reconhecidos nacional e internacionalmente. Conclusão: Pode-se concluir, portanto, que a semiotécnica envolvida, a precocidade do diagnóstico envolvido tanto local e estruturalmente, assim como o plano de tratamento envolvendo muitas vezes a inter e multidisciplinaridade, irão decorrer decisivamente em um prognóstico favorável desde que obedecidos, imprescindivelmente, todos os critérios nas bases científicas aqui compiladas.

**PALAVRAS-CHAVE:** Cirurgia Bucal, Patologia, Tomografia.
1. Introduction

Odontoma is a group of benign odontogenic tumors, or all tumor growths that develop or have developed from the tissues that form the dental organ Henrikson and Kjellman¹. Since the 20th century, this pathology has been universally recognized as an odontoma by the World Health Organization (WHO)²,³.

They are classified as mixed benign odontogenic tumours of the compound and complex type, with the compound odontoma having more organized tissues, with structures similar to micro denticles, often these structures are differentiated as enamel, dentin and rudimentary dental pulp, with a predilection for the anterosuperior region of the maxilla; the complex does not have clinically evident tissue organization and the macroscopic aspects resemble a shapeless calcified mass, with a reference for the posterior regions, both maxillary and mandibular⁴. Odontomas are diverse in nature and can be recognized as resulting from local trauma and genetic factors or anomalies that occur during the development and structuring of tissues, in the same way as simple hyperplasias, teratomas and choristomas⁵,⁶. Diagnosis is made by means of objective imaging examinations, where the professional aims to find the primary etiology of the clinical fact or by spontaneous radiographic/tomographic finding⁷.

The complications caused by this anomaly include dental retention, malocclusion, delayed eruption of permanent teeth and can go as far as major compromises such as bone resorption, fractures, pain and general discomfort in oral functionality and, in severe cases where the diagnosis was late, deviation of the dental midline and facial asymmetry due to the dento-alveolar compromise of occlusion³.
Considering the above, this work aims to compile and establish diagnostic and therapeutic planning criteria for this pathology, thus drastically minimizing the risk of problems arising from the clinical evolution of these tumors.

2. Method

For this study, 28 scientific articles were selected and analyzed from databases such as Scielo, Bireme, Lilacs and Google Scholar, as well as books and periodicals from the library of the Centro Universitário do Norte de São Paulo (UNORTE). The keywords oral surgery, pathology, tomography were used to search the digital bibliographic platforms, with a time frame from 1964 to 2023. The inclusion criteria were health articles.

3. Results and Discussion

Usually, these tumors appear or are diagnosed at the beginning of pre-adolescence and can also occur in childhood or even later, between 20 and 30 years old, when local factors, such as tooth impaction, malocclusion, midline deviation and facial asymmetry sets in and becomes clinically evident, complicating therapy, which must then be planned multidisciplinary. The literature reports that complex odontomas are diagnosed on average at 38.9 years and compound odontomas at 25.8 years\(^{8,9,10}\).

Odontomas have in their structure the presence of developed and differentiated enamel, dentin, cementum and pulp tissue. These characteristics are verified macro and microscopically (histomodification and morphodifferentiation), including their odontogenic epithelial and
mesenchymal components, showing progressive, slow growth and variable size\textsuperscript{11}.

The formation of the lesion occurs during the development of the permanent dentition, in most cases causing interference with eruption, that is, impaction or displacement to an ectopic position of the permanent successor, and after the processes involved in the formation and development of the adjacent teeth involved are completed, the whole process is finalized. This information justifies the age distribution of most patients (between 14 and 30 years old)\textsuperscript{3}.

The identification of the type of odontoma (compound or complex) occurs during occasional or elective radiological diagnosis, as reported by several authors, including De Carvalho et al.\textsuperscript{12} or most of the time, during the evaluation of clinical complaints presented by patients, requiring complementary imaging tests such as panoramic radiography and or computed tomography\textsuperscript{13}.

De Carvalho et al.\textsuperscript{12} consider that panoramic radiography is sufficient for the diagnosis of odontomas but reiterate that computed tomography may be necessary to assess the location and extent, proximity to adjacent structures such as vessels, foramina, and nerve branches, as well as an auxiliary resource for future therapeutic planning. Therefore, the clinical examination (characterization of the lesions), followed by the analysis of the radiographic images which is essential, should be the first step in the diagnostic hypothesis and therapeutic planning\textsuperscript{14}.

It is worth pointing out that, radiographically, compound odontomas have very clear pathognomonic characteristics and hardly generates any uncertainty in their recognition, as they present several structures similar to teeth or denticles with obvious anatomical deformities. The lesion is circumscribed by a radiolucent halo and the internal content is highly
radiopaque, with a predilection for the anterior region of the maxilla, associated with the crown of a dental element. Prevalence occurs in the canine region\textsuperscript{15,16,10}.

Complex odontomas are formed by an irregular mass of calcified tissue with a more subtle radiographic halo. The degree of radiopacity is equivalent to or exceeds that of neighboring dental structures and may vary from one region to another. They have a predilection for the posterior region of the mandible, in the region of the first and second molars, and this characteristic causes variations in the amount and type of hard tissue they form\textsuperscript{15,3,9,10}.

In this context, the first stage of hamartoma is seen as a radiolucency because there is no calcification of dental tissue inside the lesion. The second or intermediate stage presents partial calcifications, and in the third or radiopaque stage, the predominance of calcified tissue can already be seen, with a radiolucent halo surrounding the entire lesion\textsuperscript{17,18}.

Histologically, a compound odontoma occurs when the normal dental papilla splits into two or more, creating structures similar to dental elements, which are usually surrounded by a loose fibrous matrix. In the complex, the tissues are arranged in a disordered manner, consisting of primary or immature dentin as the predominant component, surrounded by fibrous connective tissue\textsuperscript{3,9,10}.

This detail is observed through histological evaluation, and anatomopathological and histopathological examinations are indicated to classify it and determine its definitive diagnosis. Clinical-radiographic and histopathological techniques are very reliable methods of dental diagnosis\textsuperscript{5}.

According to updated literature guidelines, the suggested therapeutic approach encompasses surgical removal of the odontoma, followed by post-operative follow-up, as detailed below\textsuperscript{19}.
More developed odontomas require special attention, due to their size, location and possible morpho-functional alterations correlated to the affected region, in order to reduce the risk of mandibular fractures, resulting from bone resorption caused by the injury as well as damage to adjacent structures, which can lead to paresis and paresthesia.\textsuperscript{20}

Treatment consists of surgical removal of the tumor. The procedure is relatively simple and can be performed by a dental surgeon in an outpatient setting, as described by various authors, including\textsuperscript{19}.

The tumor enucleation technique is well established and has a low complication rate. It is done by means of a mucoperiosteal incision and its displacement, osteotomy of the regions adjacent to the tumor, with constant irrigation of saline solution and enucleation of the odontoma.\textsuperscript{15,19}

In situations where bone resorption is exacerbated, the use of bone grafts is indicated to promote remodeling of compromised bone tissue. In more complex cases, the use of rehabilitative plates can be an additional approach to prevent fractures and promote better recovery\textsuperscript{21,22}.

The surgery ends with careful suturing, with healing by first intention, which tends to minimize complications. After the procedure, the patient can normally resume their normal daily activities, with little or no restriction, contributing to a more peaceful and satisfactory recovery\textsuperscript{23,24}.

After removal of the tumor, when the tooth is included, it is important to perform orthodontic traction. The literature shows a number of traction procedures, including: launching, which involves drilling out the tooth and bonding it directly, however, this method is not widely used or recommended due to its extensive and traumatic removal of bone.\textsuperscript{25}

When neglected and left untreated, the condition can evolve into either ankylosis or external tooth resorption (or both), causing more gingival recession and less control over the direction of traction\textsuperscript{23,24}. 

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Drilling the tooth is another widely used method for canines and in cases where proper bonding is not possible, but it can be harmful to the pulp of the tooth and the tissues of the crown. Direct bonding of a button (Plug) or orthodontic bracket is the most widely used practice because it is a safer option\textsuperscript{24}.

The dentist must inform the patient of the consequences of failed treatment, as well as the delay in removing the pathology. Some consequences can occur if there is no proper treatment, such as occlusal changes, aesthetic and phonetic disorders\textsuperscript{23,24}.

Eventually, there is a need for endodontic treatment prior to surgery if the neurovascular bundle of the teeth is compromised during the evaluation of the tomography. It is essential to carry out post-surgical follow-up, including percussion and thermal tests, in order to confirm pulp vitality and assess possible vascular involvement during surgery\textsuperscript{26}.

Pharmacological recommendations in the post-operative period are usually antimicrobials and non-steroidal anti-inflammatory drugs. Pharmacological monitoring is indicated for the prevention of infectious processes, inflammatory control and its consequences, and analgesia\textsuperscript{27}.

Post-surgical follow-up includes imaging exams to certify that the entire tumor has in fact been removed, with no recurrences and that bone remodeling has occurred in the region affected by the lesion. The case should be monitored for a period of between 6 months and a year, or until bone healing is confirmed\textsuperscript{28}.

4. Conclusion

It can therefore be concluded that careful diagnosis and consequent treatment will result in an ideal outcome when all the stages defined here
are followed. In this context, it is prudent to consider that tomography is an important resource for proper planning, from the moment of diagnosis to clinical preservation.
References


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