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ODONTOMA: SURGICAL APPROACHES AND CONSIDERATIONS IN CLINICAL MANAGEMENT

ODONTOMA: ABORDAGENS CIRÚRGICAS E CONSIDERAÇÕES NO MANEJO CLÍNICO

ODONTOMA: ENFOQUES QUIRÚRGICOS Y CONSIDERACIONES EN EL MANEJO CLÍNICO

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ABSTRACT

Odontoma is the most prevalent benign odontogenic tumor, accounting for approximately 22% of all odontogenic tumors according to the WHO. Classified as compound or complex, these hamartomatous malformations are often asymptomatic and incidentally diagnosed during routine examinations, commonly associated with eruption disturbances such as tooth impaction. This narrative literature review analyzed the surgical approaches and clinical management of these lesions, based on articles published in the last five years in the PubMed database. Accurate diagnosis depends on the correlation between clinical, histopathological, and imaging examinations, with Cone-Beam Computed Tomography (CBCT) being essential for planning in complex cases. The treatment of choice is surgical enucleation, which offers an excellent prognosis and a low recurrence rate. In cases involving associated impacted teeth, a multidisciplinary approach with orthodontic traction is often required. It is concluded that early diagnosis and meticulous surgical planning are essential to minimize complications and preserve adjacent structures.

Keywords: Odontoma. Odontogenic Tumors. Oral Surgery. Early Diagnosis. Impacted Tooth.

RESUMO

O odontoma é o tumor odontogênico benigno mais prevalente, representando cerca de 22% de todos os tumores odontogênicos segundo a OMS. Classificados em compostos e complexos, essas malformações hamartomatosas são frequentemente assintomáticas

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e diagnosticadas incidentalmente em exames de rotina, estando comumente associadas a distúrbios de erupção, como a impacção dentária. Esta revisão narrativa da literatura analisou as abordagens cirúrgicas e o manejo clínico dessas lesões, baseando-se em artigos dos últimos cinco anos da base de dados PubMed. O diagnóstico preciso depende da correlação entre o exame clínico, histopatológico e imaginológico, sendo a Tomografia Computadorizada de Feixe Cônico (CBCT) fundamental para o planejamento em casos complexos. O tratamento de escolha é a enucleação cirúrgica, que apresenta excelente prognóstico e baixa taxa de recidiva. Em casos de dentes impactados associados, a abordagem multidisciplinar com tração ortodôntica é frequentemente necessária. Conclui-se que o diagnóstico precoce e o planejamento cirúrgico meticuloso são essenciais para minimizar complicações e preservar as estruturas adjacentes.

Palavras-chave: Odontoma. Tumores Odontogênicos. Cirurgia Bucal. Diagnóstico Precoce. Dente Impactado.

RESUMEN

El odontoma es el tumor odontogénico benigno más prevalente, representando aproximadamente el 22% de todos los tumores odontogénicos según la OMS. Clasificados en compuestos y complejos, estas malformaciones hamartomatosas suelen ser asintomáticas y se diagnostican de manera incidental en exámenes de rutina, estando comúnmente asociadas a alteraciones de erupción, como la impactación dentaria. Esta revisión narrativa de la literatura analizó los enfoques quirúrgicos y el manejo clínico de estas lesiones, basándose en artículos de los últimos cinco años de la base de datos PubMed. El diagnóstico preciso depende de la correlación entre los exámenes clínico, histopatológico y de imagen, siendo la Tomografía Computarizada de Haz Cónico (CBCT) fundamental para la planificación en casos complejos. El tratamiento de elección es la enucleación quirúrgica, que presenta un excelente pronóstico y una baja tasa de recurrencia. En casos con dientes impactados asociados, suele ser necesaria una aproximación multidisciplinaria con tracción ortodóncica. Se concluye que el diagnóstico precoz y la planificación quirúrgica meticulosa son esenciales para minimizar complicaciones y preservar las estructuras adyacentes.

Palabras clave: Odontoma. Tumores Odontogénicos. Cirugía Bucal. Diagnóstico Precoz. Diente Impactado.

1 INTRODUCTION

According to the World Health Organization (WHO) Fourth Classification of Head and Neck Tumors of 2017, odontomas represent approximately 22% of all odontogenic tumors, making them the most prevalent benign odontogenic lesions. (Agarwal et al., 2023; Ram et al., 2023; Mucz kowska et al., 2025). Considered a hamartomatous malformation of dental tissues (Mazur et al., 2022), it is subdivided into two main types: compound, which has multiple organized tooth-like structures (denticles), and complex, which consists of a disorganized mass of dental tissues (Akitomo et al., 2024; Mazur et al., 2022; Agarwal et al., 2023). Compound odontomas are most often located in the anterior maxilla (74.6%), with a higher incidence in men (59%) (MAZUR et al., 2022) - Swelen, while complex odontomas are more commonly found in the posterior mandible (68.2%) (Johar; Erlina; Muttaqin, 2025).

Compound odontomas occur predominantly in the anterior region of the maxilla, accounting for 74.6% of cases (Mazur et al., 2022), while complex odontomas are more common in the posterior region of the mandible, with an approximate incidence of 68.2% (Johar; Erlina; Muttaqin, 2025). The etiology of odontoma is still unknown, but factors such as pathological conditions, trauma, infections, and hereditary syndromes (such as Gardner's syndrome) can result in abnormalities of morphodifferentiation of the cells that give rise to ameloblasts and odontoblasts. Odontomas are usually reported in the second decade of life and there is no significant gender predilection (Akitomo et al., 2024; Jeevarathan et al., 2022).

Generally, odontomas are asymptomatic and discovered accidentally during routine radiographic examinations, which are performed due to the absence or crowding of a permanent tooth (Mazur et al., 2022; Ram et al., 2023; Jeevarathan et al., 2022). However, in severe cases, pain, inflammation, infection, or lymphadenopathy may be associated (MAZUR et al., 2022) - Swelen In their radiographic findings, unilocular images that contain multiple radiopaque structures with numerous tooth-like structures, known as denticles, stand out; alternatively, they may appear as a dense radiopaque mass surrounded by a thin radiolucent border (Nguyen and Huynh, 2023).

The main clinical relevance of these lesions stems from their association with eruption disorders, being a frequent cause of deciduous teeth retention, eruptive delay, or impaction of adjacent permanent teeth (Akitomo et al., 2024; Mazur et al., 2022; Jeevarathan et al., 2022). In more extensive cases, as well as late diagnosis, these

lesions can generate local deformity due to cortical expansion, in addition to interfering with occlusion and tooth alignment. (AGARWAL et al., 2023; RAM et al., 2023).

The treatment of choice consists of surgical enucleation, usually associated with an excellent prognosis and rarefaction of recurrences (Mazur et al., 2022; Ram et al., 2023). Depending on the position and stage of development of the impacted tooth, therapeutic complementation with orthodontic traction may be necessary (Mazur et al., 2022; Jeevarathan et al., 2022). In more severe situations, such as transmigration or significant displacements, extraction of the associated tooth may be unavoidable (Mazur et al., 2022). However, this treatment often does not occur, because, most of the time, the odontoma is smaller than the permanent tooth and the latter does not have large displacements. In cases of transmigration, the treatment of choice is extraction. In the event of root displacement, orthodontic therapy should be postponed, since bone neoformation should be awaited and the examination of the vitality of adjacent elements should be performed. (MAZUR et al., 2022).

Given the high prevalence of odontomas among benign odontogenic tumors and their significant interference in the normal development of the dentition, the importance of their early identification and appropriate management becomes evident (MAZUR et al., 2022; RAM et al., 2023; AGARWAL et al., 2023). Thus, understanding the clinical and radiographic aspects and, above all, the surgical strategies for its removal is essential to optimize the prognosis and avoid functional and aesthetic complications.

2 METHODOLOGY

This study is a narrative review of the literature, focused on synthesizing and discussing therapeutic and surgical approaches to odontoma. For this purpose, a search was conducted in the PubMed database, using the descriptors "Odontoma", "Therapy" and "Surgery". The search was structured with the Boolean operators AND and OR, following the Medical Subject Headings (MeSH) terminology.

The inclusion criteria defined were: articles published in the last five years, with accessible full text, in English or Portuguese, and that dealt directly with the modalities of treatment of dentistry. Studies without direct relevance to the theme, duplicates, narrative reviews of low methodological rigor, and articles not indexed in the database used were excluded. The selection process took place in two phases: initial analysis of titles and

abstracts, and subsequent full reading of the selected articles to confirm eligibility. The relevant information was extracted and organized in a descriptive way.

3 RESULTS AND DISCUSSION

Odontomas are odontogenic tumors composed of epithelial and mesenchymal cells, so they are considered to be of mixed origin. They can be associated with syndromes such as: Gardner's, Herrmann's, and Odontomadysphagia's and present some of the most common clinical problems, such as: delayed exfoliation of primary teeth, late eruption or impaction of permanent teeth, tooth displacement, root resorption, dental agenesis, and enlargement of the follicular space (Jeevarathan et al., 2022).

The proper diagnosis of odontoma depends on the integration between clinical examination, radiographic evaluation, and histopathological confirmation (Mazur et al., 2022; Ram et al., 2023). (Mazur et al., 2022; Ram et al., 2023). Panoramic x-ray is usually sufficient to identify most lesions; however, in complex cases, multiple or close to critical anatomical structures, cone beam computed tomography (CBCT) is indispensable (Akitomo et al., 2024; Mazur et al., 2022). CBCT allows the three-dimensional evaluation of lesion morphology, the number and arrangement of denticles, cortical thickness, and the relationship with dental germs or adjacent cavities such as the maxillary sinus (Ram et al., 2023).

Final diagnostic confirmation is obtained through histopathological examination (Mazur et al., 2022; Ram et al., 2023). This demonstrates a histopathological pattern characterized by a mixture of odontogenic epithelium and mesenchymal tissue, with the formation of all mineralized dental components, such as enamel, dentin and, in some cases, pulp. In compound odontoma, these tissues are organized into well-defined denticles, while in complex odontoma there is a disorganized mass of these tissues, with no tooth-like structure (Shinde et al., 2022).

In addition, it is necessary that the diagnosis be as early as possible, since in the study by Akitomo et al., 2024, a composite odontoma was detected in an 8-year-old and 2-month-old child, in which element 65 was not present in the oral cavity and which may probably have formed before 3 years of age. The patient was being followed up in a private office only clinically, hence the confirmation of the importance of complementary tests, because if the odontogenic tumor had been detected at that age, possibly the child's

left deciduous second molar would have erupted. Furthermore, it could have reduced the child's suffering and the requirement for intervention could have been minimal.

The treatment of choice for both variants is surgical enucleation, a procedure associated with a very low recurrence rate (Mazur et al., 2022; Ram et al., 2023). Planning should prioritize the preservation of adjacent teeth and the integrity of the bone corticals. In children, the proximity of the developing dental germs makes the approach more challenging, requiring careful evaluations of the optimal timing of surgery (Akitomo et al., 2024).

Surgical planning should be meticulous to minimize morbidity. In young patients, management can be complex due to proximity to developing dental germs (Akitomo et al., 2024). What will determine the flap surgical technique will be the position of the crown in relation to the alveolus, if it is apical to the mucogingival junction, the best choice will be the closed eruption, since bone loss can be excessive. Various force elements can be used for the purpose of extruding the tooth into the arch with care that the follow-up of the periodontal insertion is ensured. (Jeevarathan et al., 2022). In one reported case, the treatment plan was sequenced to wait for complete root development of a premolar before removing an impacted primary molar and remaining odontomas, thereby avoiding iatrogenic damage (Akitomo et al., 2024).

For large odontomas, especially in the mandible, there is a significant risk of pathological fracture during removal (Ram et al., 2023). In such cases, a minimally invasive intraoral approach that involves sectioning the tumor into smaller pieces is preferable. This technique allows the removal of the mass while preserving the buccal and lingual cortical plates, as well as the lower border of the mandible, avoiding the need for grafts or fixation plates (Ram et al., 2023).

One of the main complications associated with odontoma is dental impaction (Akitomo et al., 2024; Jeevarathan et al., 2022). After tumor enucleation, the impacted tooth may erupt spontaneously, especially if it is not significantly displaced and still has eruptive potential (Akitomo et al., 2024; Mazur et al., 2022). However, orthodontic therapy is often required (Mazur et al., 2022). Combined management involves surgical exposure of the impacted tooth (sometimes with a closed flap technique) followed by orthodontic extrusion to reposition it in the arch (Jeevarathan et al., 2022). In severe situations, such as tooth transmigration, where the tooth crosses the midline, orthodontic repositioning

may be unfeasible, leading to tooth extraction along with the odontoma (Mazur et al., 2022).

Although most odontomas are intraosseous and asymptomatic, atypical presentations may occur. There have been reports of large-scale complex odontomas erupting in the oral cavity, especially in older patients (Agarwal et al., 2023). In these scenarios, the lesion may present active suppuration, communication with the maxillary sinus, and clinically mimic chronic osteomyelitis, representing a significant diagnostic challenge (Agarwal et al., 2023).

4 CONCLUSION

In view of the high prevalence of odontomas and their direct impact on the development of occlusion, their early identification is decisive for a favorable prognosis. The integration of advanced imaging tests, such as cone beam computed tomography (CBCT), with clinical evaluation allows for safe surgical planning, aiming at the preservation of dental germs and bone structures. The standard treatment consists of conservative surgical enucleation, often followed by orthodontic intervention for the repositioning of retained teeth. Therefore, proper management requires an individualized approach that considers the type of odontoma, its location, and the stage of dentition development, ensuring the patient's functional and aesthetic rehabilitation and preventing severe complications such as bone deformities or tooth loss.

REFERENCES

Agarwal, S., Rao, S., Lepcha, J., & Galhotra, V. (2023). Large erupted complex odontoma mimicking maxillary osteomyelitis. BMJ Case Reports, 16, Article e253322. https://doi.org/10.1136/bcr-2022-253322

Akitomo, T., Iwamoto, Y., Kaneki, A., Nishimura, T., Ogawa, M., Usuda, M., Kametani, M., Kusaka, S., Mitsuhata, C., & Nomura, R. (2024). Eruption disturbance in first molar and primary second molar caused by multiple compound odontomas: A case report. Journal of Clinical Pediatric Dentistry, 48(6), 236–242. https://doi.org/10.22514/jocpd.2024.126

Jeevarathan, J., Jananivinodhini, N. C., Ponnudurai, A., Vijayakumar, M., & Chidambaranathan, K. A. (2022). Management of compound odontoma with 70 denticles and impacted lateral incisor over an 8-year follow-up. Journal of Indian Society of Pedodontics and Preventive Dentistry, 40(2), 208–212. https://doi.org/10.4103/jisppd.jisppd_521_21

Johar, H. F., Erlina, Y., & Muttaqin, G. F. (2025). Abordagem multidisciplinar para odontomas complexos em indivíduos em crescimento: Dois casos clínicos. Anais de Ortodontia e Periodontia – Especialidade, 5, 63–74.

Mazur, M., Di Giorgio, G., Ndokaj, A., Jedliński, M., Corridore, D., Marasca, B., Salucci, A., Polimeni, A., Ottolenghi, L., Bossù, M., & Guerra, F. (2022). Characteristics, diagnosis and treatment of compound odontoma associated with impacted teeth. Children, 9(10), Article 1509. https://doi.org/10.3390/children9101509

Muczkowska, N., Czochrowska, E., Masłowska, K., & et al. (2025). Combined surgical and orthodontic treatment of complex odontoma in growing patients: Presentation of two cases. Dentistry Journal, 13(2), Article e82. https://doi.org/10.3390/dj13020082

Nguyen, D. K., & Van Huynh, D. (2023). Clinical and radiological characteristics of odontomas: A retrospective study of 90 cases. Imaging Science in Dentistry, 53(2), 117–126. https://doi.org/10.5624/isd.20230005

Ram, H., Sundaram, E., Katrolia, R., & Gupta, R. (2023). Huge complex composite odontoma of mandible. BMJ Case Reports, 16, Article e254948. https://doi.org/10.1136/bcr-2023-254948

Shinde, S. P., & et al. (2022). Odontogenic tumors: A histopathological overview. MGM Journal of Medical Sciences, 9(3), 258–265. https://doi.org/10.4103/mgmj.mgmj_118_22