

Dilated odontoma in the mandibular third molar region: a case report

Odontoma dilatado na região de terceiro molar mandibular: um relato de caso

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ABSTRACT

Dilated odontoma is a rare dental developmental anomaly that belongs to a class of dens in dente, being rarely described in the posterior region of the mandible. To describe a dilated odontoma in the lower third molar region, this study had a qualitative, transversal, descriptive and documentar approach, of the case report type. Developed in the Integrated Health Clinics of a University in the Extreme South of Santa Catarina, in the Dentistry Service. This article presents a case of dilated odontoma in a 32-year-old male patient. The patient had pain and swelling in the left posterior region of the mandible. The Crown of this element was clinically within the normal range, however the radiographic examination showed barrel-shaped root alteration in element 38 and expansion of the buccal and lingual cortical bone. An incisional biopsy of the anomaly was performed and sent to anatomopathological examination. According to the clinical, radiographic and anatomopathological characteristics, the diagnosis of dilated odontoma was reached. Due to the aberrant root anatomy, complete removal was chosen. The diagnosis of this abnormality depends on the clinical, radiographic and anatomopathological characteristics and its therapy varies according to the invagination. In cases of deep invagination, extraction is indicated.

Indexing terms: Dens in dente. Third molar. Tooth abnormalities.

RESUMO

O Odontoma Dilatado é uma rara anomalia de desenvolvimento dentário que pertence a uma classe de dens in dente, sendo raramente descrito na região posterior da mandíbula. O objetivo desse artigo foi descrever um Odontoma Dilatado na região de terceiro molar inferior. Materiais e métodos: este estudo teve abordagem qualitativa, transversal, descritiva e documental, do tipo relato de caso. Desenvolvido na Universidade do Extremo Sul Catarinense, no Serviço de Odontologia. Este artigo apresenta um caso de Odontoma Dilatado em um paciente do sexo masculino de 32 anos. O paciente apresentou dor e inchaço na região posterior esquerda da mandíbula. A coroa deste elemento encontrava-se, clinicamente, dentro dos padrões de normalidade, entretanto no exame radiográfico foi demonstrada a alteração radicular em forma de barril no elemento 38 e expansão de cortical óssea vestibular

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e lingual. Foi realizada a biópsia incisional da anomalia e enviado ao anatomopatológico. De acordo com as características clínicas, radiográficas e anatomopatológicas, chegou-se no diagnóstico de *Odontoma Dilatado*. Devido a anatomia aberrante optou-se pela remoção completa. O diagnóstico desta anormalidade é dependente das características clínicas, radiográficas e anatomopatológicas e sua terapêutica varia de acordo com a invaginação. Em casos de invaginação profunda a exodontia está indicada.

Termos de indexação: *Dens in dente. Dente Serotino. Anormalidades dentárias.*

INTRODUCTION

The tooth is an organ of the human body whose development is a complex biological process. The development of the tooth is a complex biological process that depends on the interactions between the dental epithelium and the ectomesenchyme. Disruption of these interactions can alter odontogenesis and cause an abnormality. This deviation from normality, depending on the stage of tooth development, may result in an irregular structure of number, size and/or shape of the root, root canal and marked deviations of the root canal and marked color deviations. Local and systemic factors may be associated with these disorders. The changes may begin before or after birth, which explains why both dentitions may be affected [1].

One of the anomalies of dental development is dens in dente, which shows a wide which shows a wide spectrum of morphological variations. This change is a result of the folding of the enamel organ in the dental papilla before the mineralization phase [2].

It is known that the nomenclature changes according to the classification of variations of dents in teeth. And one of such variations is dilated odontoma [3]. This category of anomaly is extremely rare and is considered as a severe variation of dens invaginatus. This severe variation presents as a morphologically abnormal dental element resulting in a spherical or oval calcified structure with a radiolucent central portion. Despite the presence of hamartia (defect in its development), it should not be considered as a type of odontoma (tumor) because it does not have hamartomatous growth [4].

The incidence of this pathology varies between 0.04% and 10% in the literature and it usually occurs in the permanent maxillary lateral incisors [5]. This is followed by the upper central incisors, canines and premolars. Rarely, molars are present. present with this type of anomaly [6].

The diagnosis of this anomaly can be difficult because, according to the authors [3], it is often asymptomatic and the crowns of the affected teeth can vary their presentation from mild to large external deformity. And their radiographic appearance can vary.

Based on these arguments, this article aims to describe the diagnosis and therapy of a dilated odontoma in a rare site: the region of the mandibular third molar. mandibular third molar region.

CASE REPORT

This is a descriptive and documentary case report, with a qualitative and cross-sectional design. The study was conducted at the Dentistry Department of a university's Integrated Health Clinics located in the southern region of Santa Catarina. The project received approval from the Dental Service and was subsequently reviewed and approved by the Ethics Committee for Research Involving Human Subjects.

The selection of the medical records of the patients participating in the research followed the following inclusion criteria:

- Older age;
- Male gender;
- Presence of enlarged odontoma in the lower third molar region;

- As exclusion criteria:
- Commenced treatment in the dental service before the second half of 2020;

The patient did not agree to participate in the study. Predefined categories were used to discuss the results. The content analysis proposed by Minayo [7] was used to establish the pre-defined categories.

A male patient (32 years old) with melanoderma and ASA I sought hospital care due to pain and swelling in the left posterior mandible. The hospitalization lasted for three days. Upon identifying that the infection originated from the tooth, the decision was made to remove the affected dental organ.

Following the reduction of acute signs, dental care was provided for the removal of tooth element 38. To achieve an accurate diagnosis and determine the real dimensions of the infectious focus, computed tomography images of the left mandible region were obtained. As a result, a barrel-shaped root alteration with radiopaque margins similar to cementum was identified. The radiograph revealed radiopaque margins similar to cementum, a radiolucent interior with radiopaque foci, and a wide radiolucent halo that covered the region of the retromolar region. This extended to the middle third of the left ramus of the mandible (figure 1), and was in close contact with the canal of the Inferior Alveolar Nerve (figure 2). In addition, there was an expansion of the buccal and lingual cortical bone.

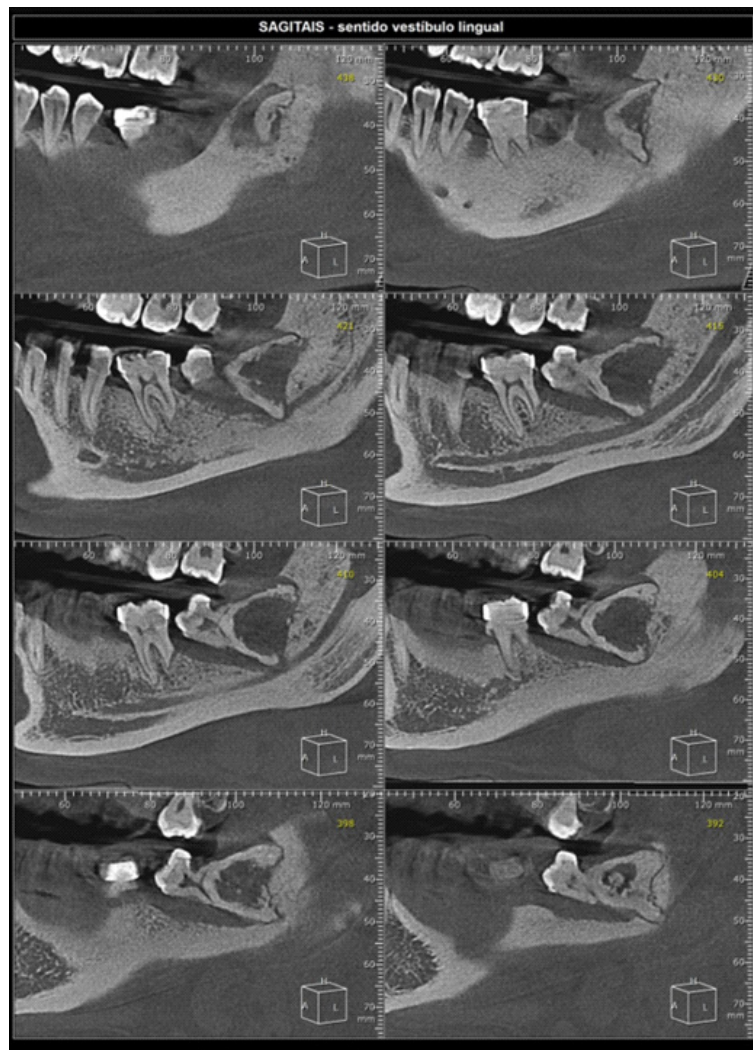


Figure 1. Sagittal sections illustrate the complete extent and characteristics of the odontoma. An odontoma with dilation in the vestibulo-lingual direction.

Note: The patient's medical record (2022).

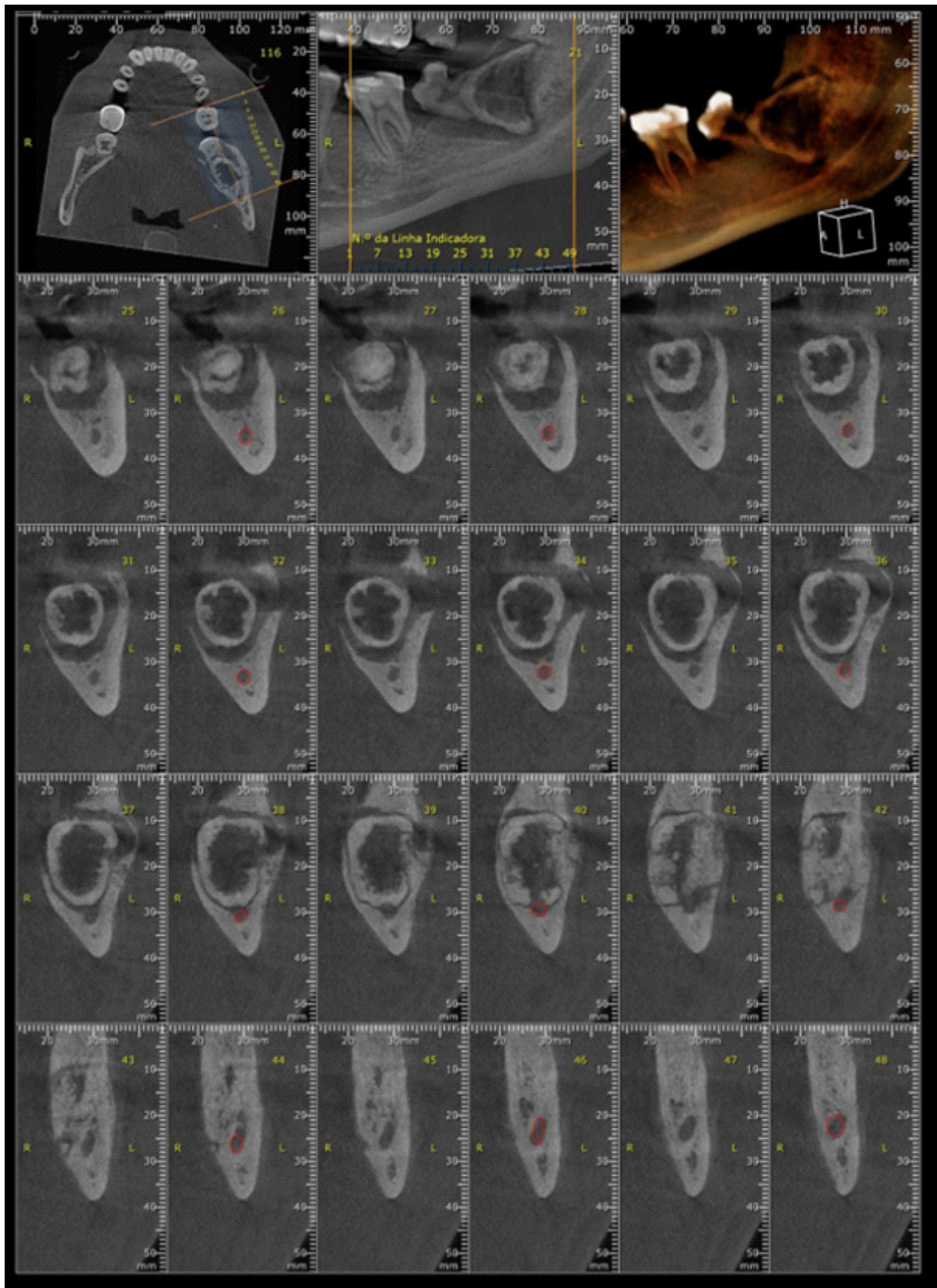


Figure 2. This study presents cross-sections that reveal the close proximity between the Inferior Alveolar Nerve canal and the Dilated Odontoma. Note: The patient's medical record (2022).

Element 38 demonstrated healthy clinical features on its dental crown. A small opening was present in the distal mucosa of this tooth, as shown in figure 3. This indicates a possible diagnosis of a dilated odontoma.

An incisional biopsy was performed to confirm the diagnostic hypothesis. Due to the risk of mandibular fracture arising from the large extent of the pathology, the biopsy was limited to the crown area and a portion of the root. Local anesthesia was performed by inferior alveolar nerve block, buccal, and lingual infiltrating 2% mepivacaine with epinephrine 1:100 000. A Newman flap was opened for detachment and sectioning of the pathology. The process of removal involved using a high rotation drill and a straight lever to remove a portion of the piece (figure 4).

The remaining part was recommended for further removal. The lesion surrounding the root was scraped, which caused bleeding that was managed by packing gauze. Then, the bony edges were made smooth, and the area was extensively flushed with saline solution before suturing it with simple stitches.

The prescribed drug therapy included two tablets of Dexamethasone 4mg, to be taken one hour prior to the surgery, and postoperative medication consisting of Dipyron 500mg, Ibuprofen 600mg, and Amoxicillin 500mg.

The patient returned for stitch removal after seven days when sufficient healing was visible.

The biopsy revealed an irregular fragment specimen of light brown, elastic tissue attached to the and soft tissue surrounding the tooth (figure 5). This specimen was sent to the pathology laboratory for anatomopathologic examination, and the histologic sections revealed a fibrous connective tissue lined by ulcerated squamous epithelium, lined by ulcerated squamous epithelium and the presence of dental tissue without atypia, which, together with the radiographic and clinical examination, led to the diagnosis of a dilated odontoma.

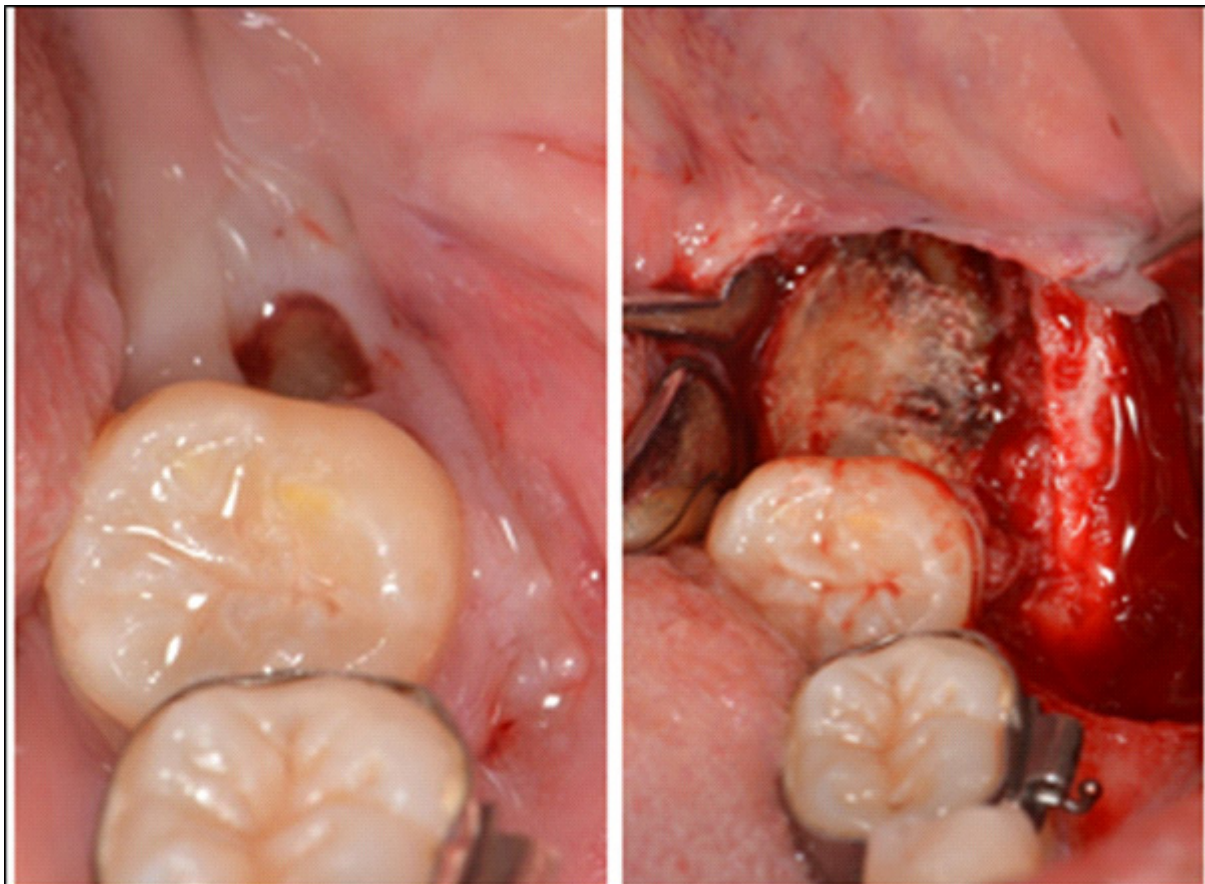


Figure 3. Element 38 has a healthy dental crown, and there is a fissure present in the distal mucosa with exposure of the surgical site.

Note: The patient's medical record (2022).



Figure 4. The specimen is being removed for additional pathological analysis.
Note: The patient's medical record (2022).

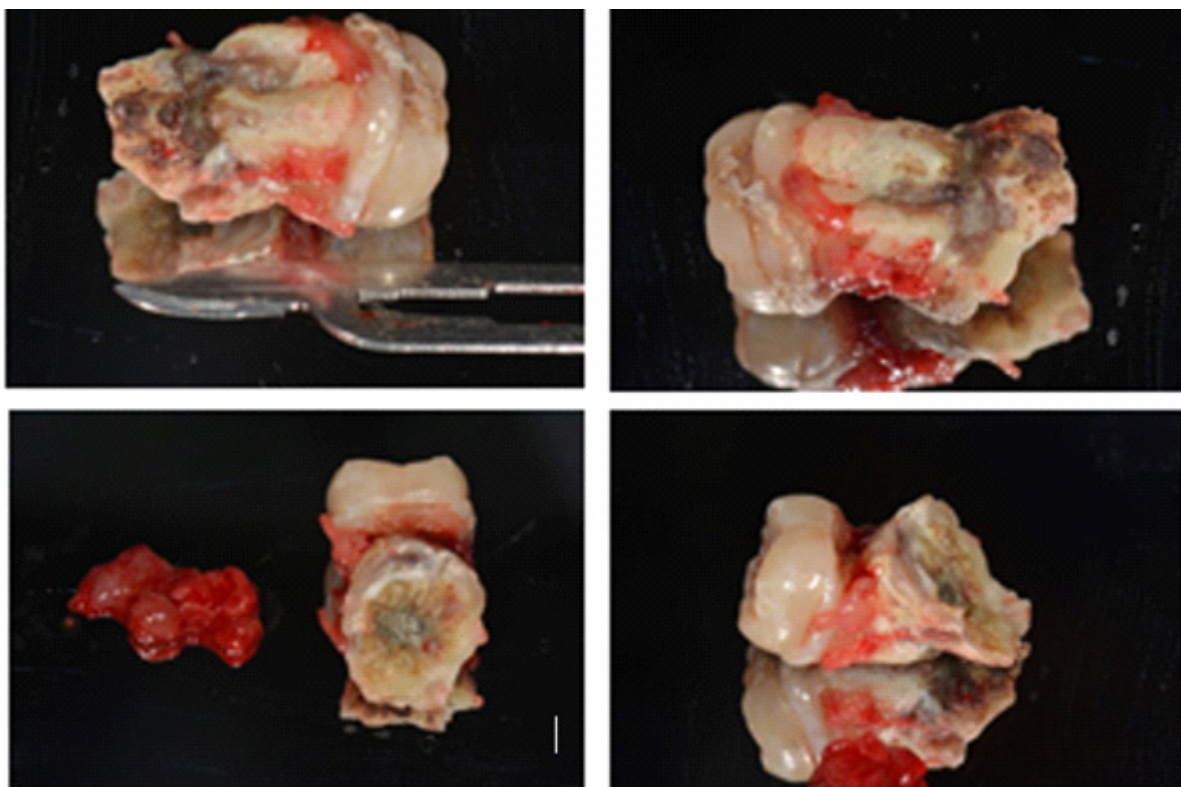


Figure 5. This statement describes a dental component that has an irregularity in its root.
Note: The patient's medical record (2022).

After five months, the patient returned for complete removal of the pathology, which was radiolucent and presented a radiopaque image with diffuse and irregular radiopaque foci. The pathology was localized in the region of the left retromolar trigone, extending from the middle third of the left ramus of the mandible to the region of element 38, alveolar ridge to the canal of the left inferior alveolar nerve. The image indicated repair of a surgical site with the presence of a tooth remnant and partial bone neoformation.

Preemptive analgesia was administered one hour prior to the surgery, consisting of two tablets of 4mg dexamethasone and one tablet of 500mg dipyron. The surgery entailed an inferior alveolar, lingual and buccal nerve block

performed with mepivacaine 2% and epinephrine 1:100 000. A Newman flap was executed, followed by divulsion and osteomy with a hammer and chisel. The remaining remnant of the dilated odontoma was then removed using forceps 69, followed by curettage and suturing with simple stitches. One year after the complete removal of the odontoma, a control panoramic radiograph (figure 6) was conducted. The radiograph showed an area of post-surgical bone neoformation. The patient will continue to be monitored.



Figure 6. Follow-up panoramic radiograph one year after the surgical removal.

Note: The patient's medical record (2022).

DISCUSSION

Dens invaginatus (DI) is an abnormality of tooth development that results from the enfolding of the enamel organ into the dental papilla before the completion of calcification. Oehler's widely accepted classification system divides this malformation into three simple categories: class I, II, III a and b [4].

Class I refers to a partial invagination that involves enamel and dentin but does not include pulp tissue and does not extend beyond the amelocementary junction. Class II is a partial invagination that extends beyond the amelocementary junction and may or may not involve the dental pulp. However, it remains within the root and does not communicate with the periodontal ligament. Class III a and b refer to complete invaginations that extend through the root and communicate with the periodontal ligament. In subdivision a, the communication happens through a second foramen on the lateral aspect of the tooth, while in subdivision b it happens through the apical foramen. Usually, both subdivisions do not involve the pulp anatomy, but they cause significant disruption of the dental anatomy [8]. In this category, the tooth may have a circular or oval shape with a translucent center and a distinctive structure, sometimes with a central soft tissue mass. In its most severe form, it is called Dilated Odontoma [4]. In this classification, the malformation can be entirely covered by enamel or cementum, and its invagination penetrates the root, perforating the apical region. It presents a "second" foramen in the apical or periodontal region [9]. Despite the mentioned classification, according to authors [8], there are reported cases such as Dilated Odontoma in the mandibular third molar root. It is believed that the proliferation and internal growth of the Hertwig's epithelial sheath occurred in the final stage of development,

leading to the dilation being more evident in the dental root. This is demonstrated in the results obtained from the current case report.

Dilated Odontoma is understood to originate during the morphodifferentiation stage of the bud phase in tooth formation, although its exact cause is not known. Proposed theories include growth pressure of the dental arch causing 'burning' of the enamel organ, focal failure of growth of the inner enamel epithelium while the surrounding normal epithelium continues to proliferate and engulf the static area, and fusion of two tooth germs and infection. Most authors describe dens invaginatus as a deep fold during tooth development, which may result in a second apical foramen in some cases. As previously described by authors [9].

Dens in dente may occur in deciduous, permanent, or supernumerary teeth, with an estimated incidence ranging from 0.04% to 10% [5]. Dens in dente typically affects lateral incisors, followed by maxillary central incisors, and more rarely, canines, premolars, and molars [8]. The results obtained showed that Dilated Odontoma was present in the lower third molar region, which has been rarely described or cited by authors in the literature [10]. The literature [4] also mentions the rarity of dens invaginatus in the mandible, mainly citing the molar region.

Furthermore, the discussed abnormality can also present symmetrically. The authors [6] demonstrate this numerically, revealing that 43% of cases exhibit bilateral symptoms. Therefore, whenever a lesion is identified, the tooth on the opposite side should also be examined. However, the authors of this report did not observe the mentioned occurrence.

Clinically, the presence of dens in the tooth can be detected by unusual crown morphology. In other cases, the tooth may appear clinically common and is detected accidentally in radiography performed for another indication. Intraorally, variations in characteristics range from clinically defined presence of the dental element, as reported by the Authors [11], to its absence. The patient may occasionally complain of diffuse pain and discomfort [4], which is not a mandatory condition and often occurs due to the presence of infection associated with the element. In this case, the crown morphology was clinically healthy and the diagnosis of Dilated Odontoma was initiated due to the presence of painful symptoms. The symptoms could be observed through a small opening in the mucosa, which served as access to infectious microorganisms. The literature [4] suggests that episodes of pain occur as a result of invagination, which creates a gateway to irritating agents that predispose to the development of dental caries, leading to pulp inflammation.

Healthy mucosa may also cover the region, without any edema or bony eminence [10]. From the extraoral clinical view, the characteristics may vary. The patient may present within normal standards [11], or they may show diffuse swelling and facial asymmetry that can be easily noticeable, as described by the authors [4]. Pain and swelling can be related to local periapical infection associated with dens invaginatus. Thus, one can notice the significant variability of characteristics described, and some similarities to the case in question, particularly regarding painful symptoms, swelling and infection of the region.

Diagnosing this type of anomaly relies on clinical and radiographic evidence. As reported by authors [11], radiographic evidence can show variations in the size and shape of the invagination, which may appear as a loop-like pear-shaped structure or a severely deformed structure with an oval or circular radiolucent shape.

In the described case, Cone Beam Tomography was utilized to identify various aspects of the associated dental abnormality due to the limitations of radiographs in identifying the type, extent, and morphology complexity of this dental anomaly, as well as actual bone loss when compared to tomographic techniques. Advanced imaging techniques, like cone beam computed tomography (CBCT), can assist in diagnosing, treatment planning, and follow-up of teeth affected by this developmental defect. CT images are highly valuable in assessing the invagination's actual nature, particularly its relationship with the root canal and other adjacent structures [6].

For such unique and uncommon pathologies, a comprehensive multidisciplinary approach should be preferred as the treatment of choice [11].

Endodontic treatment of teeth affected by dens invaginatus and pulpal/periapical disease can be challenging or sometimes impossible due to aberrant anatomy. The success of treatment may heavily depend on the internal morphology

of the affected tooth, which is highly variable and can be difficult to recognize in a clinical setting. According to the literature [12], treatment plans for severe dens invaginatus tooth types should be based on the variation in structure and differences in clinical manifestation. If the root, canal, and invagination part can be completely formed, cleaned, and filled, this type of treatment can lead to successful prognosis. However, if complete infection control cannot be achieved, extraction may be the final solution [12].

According to the authors [12], the surgical removal of a tooth affected by class III dens invaginatus lesions is well-indicated since invagination impairs tooth development and causes aberrant morphology of the tooth. The selected therapy for the case involved extracting the tooth along with all surrounding pathological tissue, based on the classification of the pathology, the extent of the inflammatory lesion, and the patient's symptomatology.

CONCLUSION

The Dilated Odontoma is a rare dental abnormality, and it has been rarely described in the region of the lower third molar. Its diagnosis is mainly made from the concurrent clinical and radiographic information. The treatment varies, but in cases of a large invagination or an aberrant alteration of dental anatomy, along with symptomatology and the presence of an inflammatory lesion, exodontia is well indicated.

Collaborators

MF Santos, contributed to project management, formal analysis, data curation, conceptualization, methodology, research, and writing. EB Baroni, provided oversight, methodology, and validation. AC Maragno, was responsible for supervision, methodology, and validation. MB Sturmer, was responsible for methodology and validation.

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