

# Surgical-orthodontic therapy of compound odontoma in the anterior maxilla

## *Tratamento cirúrgico e ortodôntico de odontoma complexo em região anterior de maxila*

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### ABSTRACT

Odontomas are odontogenic tumors subdivided into complex type (common in the posterior mandible region) and compound type. These lesions are usually asymptomatic and diagnosed in routine examinations, are more frequent in the second decade of life. The objective of this case is to report the treatment of a patient with complex odontoma in childhood in the anterior maxilla. A nine-year-old patient sought dental care due to non-eruption of an anterior permanent tooth. After clinical examination and radiographic analysis, the diagnostic hypothesis of odontoma was confirmed. Surgical removal of the lesion and use of orthodontic appliances were indicated. After the therapeutic protocol, the case was completely resolved. Due to the absence of symptoms, many cases of odontomas are neglected. However, it is evident that the sooner diagnosed, the better the prognosis of the patient.

**Key words:** maxilla; odontoma; child.

### RESUMO

*Odontomas são tumores odontogênicos subdivididos em tipo complexo (comum em região posterior de mandíbula) e tipo composto. Essas lesões geralmente são assintomáticas e diagnosticadas em exames de rotina; são mais frequentes na segunda década de vida. O objetivo deste caso é relatar o tratamento de um paciente com odontoma complexo na infância em região anterior de maxila. Paciente de 9 anos procurou a clínica odontológica devido a não erupção de um dente permanente anterior. Após exame clínico e análise radiográfica, a hipótese diagnóstica de odontoma foi confirmada. Remoção cirúrgica da lesão e uso de aparelho ortodôntico foram indicados. Após o protocolo terapêutico foi realizada a resolução completa do caso. Devido à ausência de sintomas, muitos casos de odontomas são negligenciados. Entretanto, quanto antes diagnosticado, melhor será o prognóstico do paciente.*

**Unitermos:** maxila; odontoma; criança.

### RESUMEN

*Los odontomas son tumores odontogénicos subdivididos en tipo complejo (común en región posterior de mandíbula) y tipo compuesto. Esas lesiones generalmente son asintomáticas y diagnosticadas en pruebas de rutina; son más frecuentes en la segunda década de vida. El objetivo de este caso es el de reportar el tratamiento de un paciente con odontoma complejo de la infancia en región anterior de maxilar. Niño de 9 años acudió a la clínica odontológica a causa de la no erupción de un diente permanente anterior. Tras examen clínico y análisis radiográfico, se estableció la hipótesis diagnóstica de odontoma. Remoción quirúrgica de la lesión y uso de aparato dental fueron indicados. Después del protocolo terapéutico se hizo la resolución completa del caso. Debido a la ausencia de síntomas, muchos casos de odontomas son ignorados. Sin embargo, cuanto antes sea diagnosticado, mejor será el pronóstico del paciente.*

**Palabras clave:** maxilar; odontoma; niño.

## INTRODUCTION

Odontomas are benign odontogenic tumors of slow growth and non-aggressive behavior. Because they are often asymptomatic, leading to late diagnosis (routine radiographic investigations); thus, they can cause serious complications in the developing dentition and occlusion of an individual<sup>(1-5)</sup>.

In general, these lesions are diagnosed in the second decade of life<sup>(6)</sup> and comprise normal epithelial and ectomesenchymal cells with defective structural organization (hamartoma). According to their organization, they are subdivided into complex and compound types. The former manifest as a disorganized mass of enamel, dentin, and cement and are more common in the posterior mandible<sup>(7)</sup>. The latter are elements similar to teeth<sup>(1)</sup>, commonly observed in the anterior maxilla<sup>(8)</sup>.

Among the etiological factors, the following stand out: trauma in the deciduous dentition, hereditary anomalies such as Gardner syndrome, hyperactivity of odontoblasts or changes in genetic components responsible for tooth development<sup>(1)</sup>.

Unlike what is described in the literature on the most frequent localization<sup>(7)</sup>, this article reports the clinical case of a 9-year-old child who presented complex odontoma in the anterior maxilla. The authors highlight the resulting orthodontic complications and present the complete resolution of the case, as well as the long-term follow-up of the patient.

## CASE REPORT

A 9-year-old female white patient attended dental care with absence of one incisor tooth. In the anamnesis, the mother reported dental trauma at 2 years of age, with no proper dental care.

General and extraoral examinations showed no alterations. On intraoral examination, absence of tooth 21 (left central incisor) was observed (chronologically delayed when compared to teeth 11, 12, and 22, already erupted). In this region, a swelling pale in color and firm consistency was also observed (involving the attached gingiva and alveolar mucosa); with no spontaneous or triggered pain sensitivity (**Figure 1**).

Periapical radiography showed impaction and gyroverson of tooth 21, in addition to intraosseous lesion located in the area between the roots of teeth 11 and 21, near the alveolar ridge. This was an irregular, disorganized and radiopaque mass, of nodular aspect, surrounded by a radiolucent halo (**Figure 2**).



FIGURE 1 – Intraoral examination

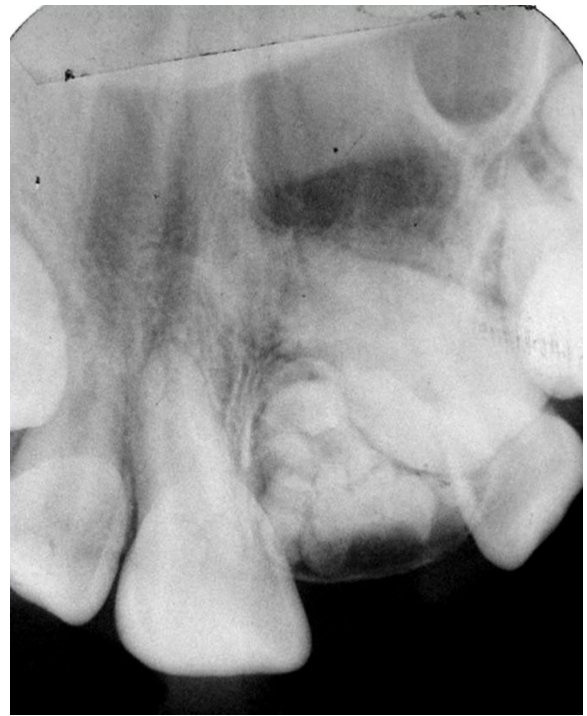


FIGURE 2 – Periapical radiography

The diagnostic hypothesis of odontoma was based on radiographic features and clinical history of trauma in early childhood.

The treatment of choice was surgical removal. After the previous aseptic technique to prepare the field, nasopalatine nerve block and buccal vestibule complementation anesthesia in the central incisors region were performed. The incision was made at the mucobuccal fold in the region of teeth 11 and 12, with total detachment of the flap for identifying the bone cavity (**Figures 3 to 6**). After total removal of the tumor mass, the fibrous capsule of the lesion and the remaining proliferative-inflammatory tissue in the bone cavity were curetted, followed by irrigation and aspiration for cleaning



FIGURE 3 – Surgical procedure

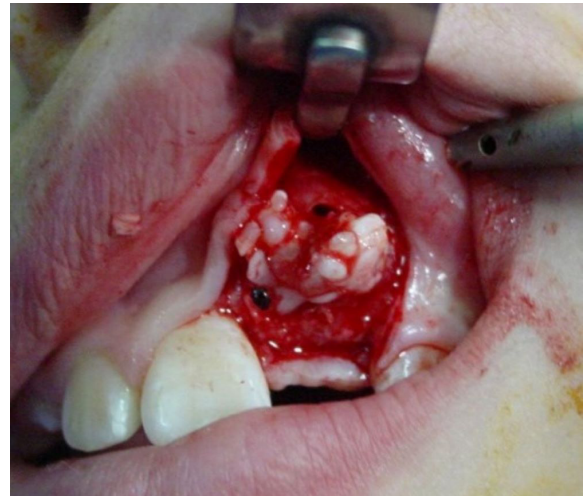


FIGURE 6 – Surgical procedure

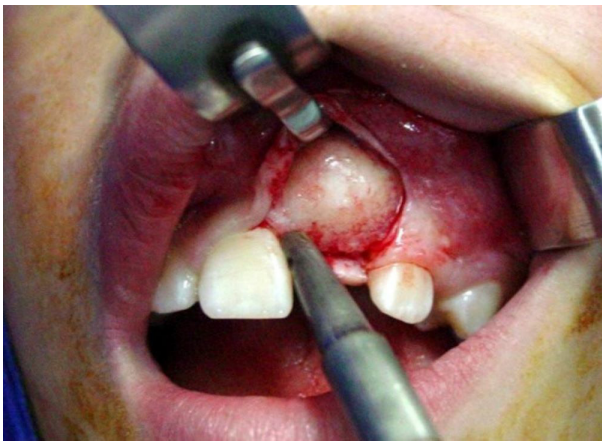


FIGURE 4 – Surgical procedure

(**Figures 7 and 8**), and the total removal of the lesion was confirmed. On the eighth postoperative day, the suture (silk thread 4-0, isolated stitches) was removed (**Figure 9**).



FIGURE 7 – Surgical procedure

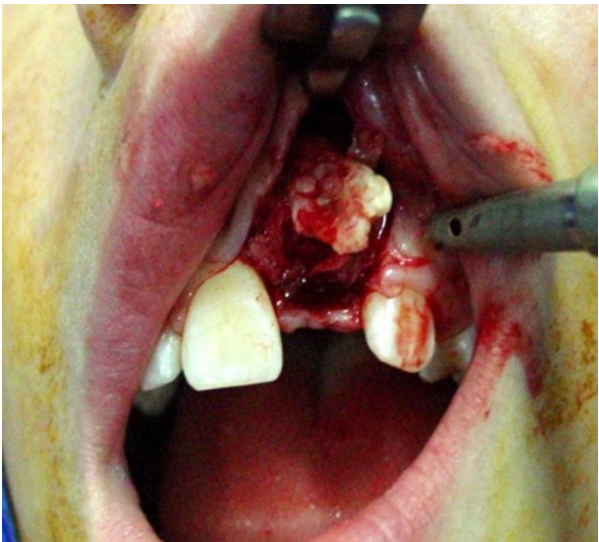


FIGURE 5 – Surgical procedure



FIGURE 8 – Surgical procedure

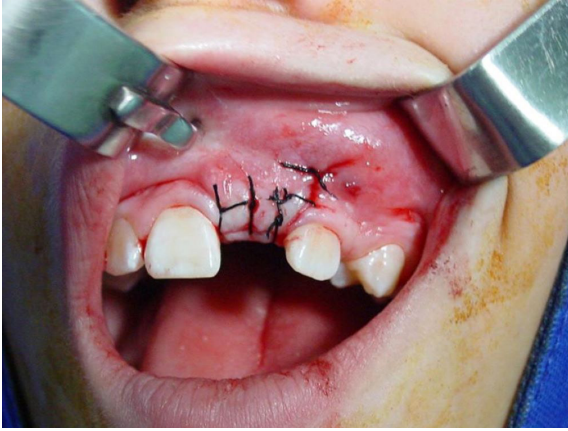


FIGURE 9 – Sutures

Macroscopically, the lesion comprised calcified masses of white color similar to dental tissues masses, but without anatomical features of a tooth, whose complex odontoma diagnosis (**Figure 10**) was confirmed by histopathological examination.

After surgical wound healing, orthodontic treatment was initiated. Fixed straight wire appliance was installed in the upper arch with the initial objective of aligning and leveling, as well as obtaining roots parallelism of the adjacent teeth in the space of tooth 21 included<sup>9, 10</sup>. Leveling was initiated with 0.14 nickel-titanium wire (NiTi). Every 30 days, the patient was evaluated to verify the evolution of alignment and leveling with wires 0.16', 0.18', 0.20' round steel, finishing with 17 × 25 rectangular steel wire. After the use of this wire, an open coil NiTi spring created space (after 60 days) for tooth 21 eruption (after nine months), and was kept passive for four months until the complete eruption of this tooth. The application of this type force in smaller caliber wires may cause the deflection of the wires and transmit inappropriate moments of force to the adjacent teeth, causing convergent inclination of their roots.



FIGURE 10 – Macroscopic aspect of the lesion

Subsequently, orthodontic bracket was glued on the center of the vestibular face. The mechanics on the Niti 0.14' wire (supported by 18 × 25 steel wire) corrected the inclination and gyroversion of tooth 21, with minimal side effect – the loss of marginal gingiva support caused a small height difference of the cervical gingiva. The fixed orthodontic treatment was completed when the patient completed 12 years of age (**Figures 11 and 12**), without recurrence of the lesion.



FIGURE 11 – Installing the orthodontic appliance



FIGURE 12 – Final intraoral aspect

## DISCUSSION

Recent studies have shown that, among odontogenic tumors, odontomas are the second most prevalent. Siriwardena *et al.* (2019)<sup>(11)</sup> and da Silva *et al.* (2018)<sup>(12)</sup> observed these lesions in 25.5% and 36.1% of the cases analyzed, respectively. These tumors are second only to ameloblastomas.

The case of complex odontoma in this report is in line with the literature on: i) gender of the patient<sup>(13)</sup>; ii) previous dental trauma history<sup>(1)</sup>; and iii) association with permanent dental eruption delay<sup>(14)</sup>. However, it disagrees with the following: i) age, since the tumor was diagnosed in a 9-year-old patient and the literature reports that approximately 88% of the cases are diagnosed in the second decade of life<sup>(6)</sup>; ii) to the place of occurrence, instead of the posterior mandible (site of higher occurrence), the lesion was located in the anterior maxilla, where the compound prevails<sup>(8,15)</sup>.

The female gender is the most affected, but the reason is still unknown<sup>(13)</sup>. Regarding the etiology, among the available theories, it is believed that local infection, hereditary influence, and traumatic injuries can induce the development of odontomas<sup>(1,16)</sup>. The present clinical case corroborates the positive association, already reported in the literature<sup>(14)</sup>, but not determinant, among odontoma, in addition to the delay in dental eruption, which is the most prevalent initial sign<sup>(3)</sup>. Thus, when there is incompatibility between the chronology of development and dental eruption, associated or not with alveolus tumefaction and mal-positioning of the teeth, immediate radiographic examination is required for anomaly research. This fact may also have contributed to the diagnosis before the second decade of life, since the person responsible for the patient, when noticing the non-eruption of the tooth, sought dental service.

Early diagnosis may have contributed to the favorable prognosis, because the detection of the lesion in the period of mixed dentition minimizes or avoids more complex orthodontic complications<sup>(1)</sup>. In the present report, although there was no ectopic resorption of the roots of adjacent teeth and development of cysts, among other problems, the time elapsed until diagnosis was sufficient to divert the eruption path of tooth 21 and cause tooth migration (loss of space) and occlusal problems, impairing patient's facial aesthetics, which was reestablished after the use of orthodontic appliance. At that time, careful observation of

radiographic features<sup>(16,17)</sup>, essential for surgical planning, was the most commonly used means to diagnosis, but currently computed tomography is an unquestionable complementary method. In addition, the histopathological confirmation of the macroscopic clinical diagnosis of the specimen after surgical excision – treatment of choice, regardless of the distinction between complex and compound – seems to be a non-essential method.

Regarding surgical treatment, it is recommended that it involves total excision of the lesion and fibrous capsule at an opportune time, avoiding harm noble structures<sup>(7)</sup>. Orthodontic treatment, when initiated early – against healing evidence – enables a less complex mechanics (lower cost) and improves prognosis. Although the retained tooth erupts after the removal of the lesion in 45% of the cases<sup>(18)</sup>, this process heavily depends on dental morphology, root formation, location, age of the patient, and available space in the dental arch – in this case, obtained by open coil spring activation. In the present case, dental traction was not necessary, as there was potential for spontaneous eruption of tooth 21, since one third of the root was in formation at diagnosis. Finally, the parallelism associated with adequate occlusion and containment period reduces the relapse tendency of malocclusion.

## CONCLUSION

The diagnosis and orthodontic surgical treatment performed in the phase of excellent potential for tooth 21 eruption promoted its spontaneous eruption, favoring the prognosis. The orthodontic mechanics employed allowed the conclusion of the case successfully. It is evident that the earlier the tumor is diagnosed, the better the prognosis and the lower the sequelae caused by the lesion.

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