CYSTIC ENUCLEATION ASSOCIATED WITH CORONECTOMY OF LOWER THIRD MOLAR DISPLACED TO THE MANDIBULAR BASILAR: CASE REPORT

ENUCLEAÇÃO DE CISTO DENTÍGERO ASSOCIADA A CORONECTOMIA DE TERCEIRO MOLAR INFERIOR NA BASILAR MANDIBULAR: RELATO DE CASO

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RESUMO

A coronectomia consiste na remoção da coroa do dente mantendo a raiz "in situ", sendo uma abordagem alternativa à extração convencional dos terceiros molares inferiores. Alguns estudos e séries de casos avaliaram os resultados dessa técnica na presença de lesões císticas. Este trabalho tem como objetivo relatar um caso de associação de técnicas cirúrgicas para exodontia de um terceiro molar inferior associado a um cisto dentígero e localizado próximo à basilar mandibular, com alto risco de lesões transoperatórias. Inicialmente foi realizada uma biópsia incisional com consequente descompressão da lesão e um ano depois foi realizada a enucleação cística e coronectomia do dente envolvido. Apesar da complexidade cirúrgica para execução da técnica de coronectomia neste caso, o acompanhamento pós-operatório periódico demonstrou ausência de complicações e as análises radiográficas indicaram a resolução da patologia cística. Durante o período avaliado de 1,5 anos, a migração total das raízes foi de 2,64 mm. A migração mais significativa das raízes dentárias remanescentes ocorreu nos primeiros seis meses de pós-operatório, com neoformação óssea na região.

PALAVRAS-CHAVE: Coronectomia; Enucleação; Lesão Nervo Alveolar Inferior; Cirurgia de terceiro molar inferior; Cisto odontogênico.

ABSTRACT

The coronectomy technique consists in the removal of the crown from the tooth while maintaining the root "in situ", an alternative approach to conventional extraction of lower third molars. Some studies and case series have evaluated the outcomes of this technique in the presence of cystic lesions. This study aims to report a case of association of surgical techniques for the extraction of a lower third molar associated with a dentigerous cyst and localized near the mandibular basilar, with a high risk of transoperative injuries. Initially it was performed an incisional biopsy with consequent decompression of the lesion and one year later, the cystic enucleation and coronectomy of the involved tooth were carried out. Despite the surgical complexity to execute the coronectomy technique in this case, the periodic postoperative follow-up demonstrated absence of complications and the radiographic analyses indicated the resolution of the cystic pathology. During the evaluated period of 1.5 years, the total migration of the roots was 2.64 mm. The more significant migration of the remaining dental roots occurred in the first six postoperative months, with new bone formation in the region.

KEYWORDS: Coronectomy; Enucleation, Inferior alveolar nerve injury; Mandibular third molar surgery; Odontogenic cyst.

1. INTRODUCTION

Impacted teeth may cause caries lesions, odontogenic infection, destruction of adjacent teeth, and periodontal disease. In 16% of cases, they cause the appearance of cysts and/or tumors of the jaws^{1,2}. The third molars are the most commonly affected teeth, with a prevalence of 16.7% to $68.6\%^{3,4}$. When associated with cystic lesions, extraction is necessary to remove the cause and solve the pathology. In most cases, the treatment for cystic lesions related to impacted teeth consists of enucleation and curettage of the lesion and extraction of the impacted tooth⁵.

A unique situation is the case of impacted third molars whose roots are in close contact with the Inferior Alveolar Nerve (IAN), where the extraction procedure presents a high risk for causing paresthesia in this nerve or displacing the teeth to positions that may endanger the integrity of the mandibular bone. The coronectomy technique, which consists of removing the crown from the tooth while maintaining the root "in situ", is considered an alternative approach to conventional extraction of lower third molars^{6–9}. To date, some reports and case series have evaluated the outcomes of this technique in the presence of cystic lesions^{10–12}.

This study aims to report a case of incisional biopsy in association with consequent decompression of the lesion, with subsequent cystic enucleation and coronectomy of the third molar. This technique was used to treat a displaced impacted lower third molar near the IAN, associated with a wide dentigerous cyst, highlighting the absence of complications after a 1.5year follow-up.

2. CASE REPORT

Patient S.H.S, 32 years old, female, leukoderma, attended a public dental clinic in June 2018, with pain and recurrent infection in the right lower third molar region. A first imaging investigation, using a periapical radiograph, revealed a radiolucent lesion of approximately 2.5 cm, involving the dental crown of the impacted right lower third molar, and this lesion extended to the distal region of this element. The tooth presented itself in position C, class II of Pell & Gregori, vertical (Winter) in deep retention and closely related to the Mandibular Canal (MC). Thus, informed consent from the patient was obtained and incisional biopsy under local anesthesia was performed.



Figure 1. Pre-operative image exam. 1A. Panoramic view of a Cone Beam Computed Tomograpy showing the intimate relation between tooth #48 and the inferior alveolar nerve; 1B. Parasagital view of tooth #48, revealing the intimate contact of the lingual face of the roots with the mandibular canal; 1C, 1D. Most critic features showing the intimate relation between the lingual root with the alveolar inferior nerve and also the tooth proximity with the mandibular basilar.

The histopathological features defined the diagnosis as Dentigerous Cyst. Surgical treatment was proposed; however, the patient was pregnant and chose to postpone the procedure until the end of pregnancy since she did not present any associated symptoms.

In June 2019, approximately one year after diagnosis, the patient returned to the service complaining of mild symptoms at the site. A panoramic radiograph was requested for a global assessment of the region, followed by a Cone Beam Computed Tomography to plan the surgical procedure. The exam confirmed the intimate relationship of the lower third molar with the IAN and the mandible basilar region (Figure 1).

There was a slight reduction in the size of the lesion through the visualization of the bone trabeculate in the area, related to the initial cyst decompression during the rupture of the capsule to perform the incisional biopsy. The patient was clarified about the possibility of paresthesia of the IAN, transoperative hemorrhagic accident, and the risk of mandibular fracture when applying the conventional surgical technique of extraction of the lower third molar. Coronectomy was suggested as an alternative, and the patient provided her free and enlightened consent to this technique. It was prescribed 2 g of amoxicillin 1 hour before surgery. The procedure was performed under local anesthesia using 2% mepivacaine hydrochloride with adrenaline 1: 100,000. A Winter incision was made, deepening the relaxing incision to the bottom of the mandibular groove, followed by the mucous periosteal detachment. Initially, the cyst remnants curettage was performed (Figure 2-A).



Figure 2. The surgical procedure. 2A. after curettage of the cystic remnants; 2B. Start of odontosection to separate the crown from the root fragment at the amelo-cementary limit; 2C. After removing the crown, it was performed enamel wear and regularization of the bone margins with a spherical diamond tip # and a carbide n. 6, respectively; 2D. Bone fragments, tooth crown and the cystic capsule.

The lesion had fenestrated the bone plate in the occlusal region and this communication was enlarged, by osteotomy, towards the oblique line with the aid of a Zecrya[®] 151 drill, under abundant irrigation, longitudinally weakening the area in 3 fragments, which were removed with chisels in small portions, to minimize the risk of mandibular fracture (Figure 2-B). The odontosection began with a cut in the mesial

direction and the point of insertion of the drill in the cervical region, at the height of the amelo-cementary limit, towards the lingual, separating the crown of the root fragment. The removal of the coronary portion was performed with the aid of the curved Seldin lever, without mobilizing the root (Figure 2-C). Then, with the spherical diamond tip #6, the remaining enamel was used, and the bone edges were regularized with a carbide n. 6 (Figure 2-D). After abundant irrigation with saline solution, an inspection of the cavity, verification of clot formation, and absence of pathological tissue in the region, the suture was performed with isolated stitches and 3-0 silk.

The patient received written postoperative instructions and continued antibiotic therapy, with 500mg of amoxicillin every 8 hours, for seven days; Naproxen, 550mg, once a day for five days and Tylex 500mg, two pills every 6 hours, replaced on the second day by Dipyrone 500mg, two pills every 6 hours, for another three days.

There were no immediate or postoperative complications, and the suture was removed after the seventh day, when the patient was in good general condition, with no complaints. The periodic follow-up with clinical evaluation and panoramic radiographs took place in the following periods: an immediate postoperative period of 7 days, (Figure 3-A), 30 days (Figure 3-B), 06 months (Figure 3-C), and 1.5 years (Figure 3-D) where bone neoformation and migration of the root remnant were found compatible with the procedure performed and with the resolution of the cystic pathology.



Figure 3. Post-operative radiographic follow-up. Figure 3A. 07 days post-operative panoramic radiograph showing the tooth remnant in adequate position, without dislocation or enamel presence; Figure 3B. 30 days post-operative panoramic radiograph revealing the still discreet root migration towards oclusal plane; Figure 3C. 06 months post-operative panoramic radiograph showing significant migration of the roots and also, evidencing new bone formation partially covering the root fragment (pointed by yellow arrow); Figure 3D. 1.5 years post-operative panoramic radiograph revealing new bone formation and visible trabecular bone surrounding the roots (yellow arrows),

delimited by hard lamina.

3. DISCUSSION

Initially, cystic lesions were a contraindication for coronectomy of impacted lower third molars^{13,14}, and these lesions were considered exclusion criteria in some studies¹⁵. However, the success of the technique in these cases has been reported in past studies^{12,13}. In this study, the presence of a cystic lesion resulted in the migration of the lower third molar towards the mandibular basilar, close to the IAN. Due to the atypical position of the tooth, conventional extraction was contraindicated to avoid postoperative paresthesia and decrease the chance of a possible mandible fracture. Therefore, the authors proposed the cystic enucleation associated with the third molar coronectomy at the same surgical time, based on Henien *et al.* $(2017)^{12}$. This study demonstrated that the association of the surgical technique enables the removal of the cystic capsule, preventing the recurrence of the cyst as it eliminates fixation to the cementumenamel junction during crown removal. Malden et al. $(2010)^{10}$ also stated that the treatment of a dentigerous cyst associated with a lower third molar, through enucleation in association with coronectomy, performed in a single procedure, reduces the risk of IAN injury and makes all removed tissue available for histopathological examination.

The histopathological report prior to the surgical approach of the third molar allowed safer surgical planning due to the assurance of a dentigerous cyst diagnosis, a pathology with low recurrence rates^{5,16}. During the incisional biopsy, the rupture of the cystic capsule occurred, starting the decompression of the lesion and, consequently, bone neoformation in the region, as evidenced in the preoperative CT. The literature^{12,13} reported decompression prior to enucleation, justified by the extensive size of the lesion, as occurred in this case report.

Despite the slight bone formation, the apical position of the lower third molar in this case still constituted an aggravating risk for mandibular fracture during tooth extraction, primarily when it is located in proximity with the basilar and in the presence of lesions¹⁷. Thus, besides the possibility of IAN injury, the choice of coronectomy was based on reducing the risk of bone fracture and other postoperative complications, even when associated with cystic pathologies^{11,12}.

The surgical technique modification used in this case, with partial fragmentation of the oblique line and the use of chisels and levers through careful movement, probably provided the success of the case, as reported by Glesson *et al.* $(2012)^{13}$. This surgical approach is justified by the position of the inferior third molar, which was vertical and whose crown was below the cervical margin of the lower second molar, making the section of the crown very difficult. Pogrel $(2007)^{18}$, initially contraindicated this dental position, but it has been performed by several authors, despite the technical difficulties^{13–15,19}.

Pogrel *et al.* $(2004)^7$ recommended radiographic

control immediately after surgery and after six months, with additional follow-up controls after this period only in symptomatic patients. Other authors recommend follow-ups for more than six months even in asymptomatic patients, due to the possibility of late symptoms or root exposure and in cases of associated cystic lesions, to assess relapse^{6,12,15}.

The post-operative image exams demonstrated root migration, with their distance from the mandibular basilar and with new bone formation around the entire dental remnant, which reduced the risk of mandible pathological fracture, and these results are compatible with the cystic lesion remission. The amount of root migration was measured according to the methodology of Leung and Cheung⁸. A more significant migration of the remaining dental roots occurred in the first six postoperative months, where the roots moved a total of 2.205 mm towards the occlusal edge and a daily migration speed of 0.0121 mm/day. In the next twelve months of follow-up, root migration was only 0.435 mm, proving a decrease in daily migration speed to 0.0011mm/day in this period. These findings corroborate the descriptions of Pedersen et al. (2019)²⁰, Leung and Cheung⁸, Yeung et al. (2018)²¹.

Continued migration of the roots may result in eruption in the oral cavity, with reports of up to seven years postoperatively²². The average migration of the remaining roots found in the literature ranges from 2 to 4 mm^{7,8,17,22,23}. However, there are migration reports of up to 10.5 mm in 3 years, without the eruption of roots in the oral cavity²⁴. However, in this 1.5-year post-operation control, clinically, there were no symptoms or exposure of the roots to the oral environment, so there was no need for reintervention, according to Barcellos *et al.* (2019)⁶.

Thus, the patient is free of symptoms and exclusively under clinical and radiographic control until the present moment. The postoperative follow-up time is similar to most of the cases described by Heinen *et al.* $(2017)^{12}$.

4. CONCLUSION

This finding proves that, after following all the technical precepts, coronectomy can be an excellent alternative for cystic lesions associated with crowns of retained teeth close to the IAN and/or at risk of bone fractures, and therefore avoiding these complications.

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