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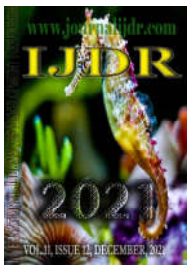

RESEARCH ARTICLE OPEN ACCESS

COMPLICATIONS RELATED TO IMPACTED THIRD MOLARS: LITERATURE REVIEW

***Gabriela de Almeida Mendes, Gleiciany Guerreiro Gonçalves, Roany Silva Bindá, Rebeca Luzia Solarte Barbosa, Mario Jorge Souza Ferreira Filho and Yuri da Silva Pimenta**

Centro Universitário do Norte – UNINORTE

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****Corresponding author:***
Marco Mazzarotto

ABSTRACT

The third molars are the last elements of the dental arch to erupt, in view of that, it holds back several complications and pathologies. This study aims to carry out a literature review in order to support the importance of complications related to impacted third molars, in order to avoid any complications for the dentist and the patient. As a research source, the following were used: Academic Google, PubMed and Scientific Electronic Library (SciELO). Among the existing complications, we have odontogenic infections, mandibular fractures, pericoronitis, carious lesions, orofacial pain, root resorption of the adjacent molar, cysts and odontogenic tumors. The dental surgeon must be able to deal with any complications, and identify the risk factors that may occur during their dental appointments, in order to bring safety to the patient and avoid possible iatrogenic events.

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INTRODUCTION

Third molars are the last teeth to erupt in the dental arch, the classifications popularly known among dental surgeons are those of Winter and Pell & Gregory that determine the angulations and depth of inclusion of the third molars. Based on these classifications, associating them with clinical examination and complementary images, dentists perform a surgical plan that is more appropriate for each patient (DIAS-RIBEIRO *et al*., 2017). Winter's classification (1926) correlates the position of the long axis of the third molar in relation to the adjacent second molar, describing them as mesioangular, distoangular, vertical, horizontal, vestibuloangular, lingual and inverted. Pell & Gregory in 1933 classified them based on the ramus of the mandible and the occlusal plane, defining them as A, B and C according to the location of the crown of the third molar compared to the second molar and outlining classes of I, II and III for the inclusion of third molars in the mandibular ramus (DE OLIVEIRA *et al*., 2017; MARCHI *et al*., 2020). The inclusion of third molars does not always cause symptoms to patients, in some cases they remain impacted for years without causing harm, but in cases where the impacted third molar is positioned in a way that will generate discomfort, pathological problems or complications for the patient, it is indicated to its removal (MATOS *et al*., 2017).

Among the existing complications, we have odontogenic infections, mandibular fractures, pericoronitis, carious lesions, orofacial pain, root resorption of the adjacent molar, cysts and odontogenic tumors. Due to the position in which the element is found, for a satisfactory prognosis it is necessary that the dentist obtain an early diagnosis so that immediate treatment can be applied (JUNIOR *et al*., 2019). It is extremely important that the professional has knowledge about such complications and their possible risks to be correctly evaluated, because through the interpretation of clinical and radiographic findings, it is possible to carry out a detailed and safe surgical planning, avoiding possible iatrogenic events (ALVES-FILHO *et al* ., 2019). This study aims to carry out a literature review in order to support the importance of complications related to impacted third molars, in order to avoid any complications for the dentist.

LITERATURE REVIEW

The present study was based on a literature search on complications related to impacted third molars. With a selection of 72 articles, of which only 22 were left by the exclusion method, where one of the criteria was the publication date, being chosen from the year 2016 to the year 2021, to obtain updated information on the subject.

As a search source, the following were used, Academic Google, PubMed and Scientific Electronic Library (SciELO). As keywords used for research, we have: third molar, maxillofacial surgery, oral pathology, root resorption and odontogenic cysts.

CYSTS AND TUMORS

Odontogenic cysts have an asymptomatic evolution, usually occur unilaterally, but even though it is not common, it is possible to appear bilaterally, their origin is related to impacted or impacted third molar crowns. With its evolution, complexities can arise, such as secondary infections that cause painful discomfort to patients (SINDI *et al*., 2019). Dental surgeons can observe this pathology radiographically, described as defined and radiolucent lesions with their ends interconnected to unerupted dental elements, with a tendency in the mandibular regions, other imaging tests such as computed tomography can be used to complement the diagnosis and assist in the surgical plan of the case, according to Sindi *et al*. (2019). In addition to presenting indeterminate sizes, they bring damage to structures close to their origin, infectious complications and other pathologies (MOLDOVAN *et al*., 2021). The prophylactic removal of impacted third molars generally has positive results when performed in young patients, reducing the rate of cases of this pathology. In older patients (mainly males), there is a predisposition to cysts or tumors, as prophylactic removals in these patients are avoided because they have a slower surgical recovery (SHIN *et al*., 2016).

OROFACIAL PAIN: Orofacial pain is pain that involves the hard and soft tissue that surround the eyes and ears, affecting all classes and ages. It is considered common among people, even though it is not the main reason for seeking assistance from a dentist. These pains encompass several other factors, such as pain due to temporomandibular disorders, intraoral and dental diseases, in addition to neuropathic and neurovascular pain (MKSOUD *et al*., 2020; PERES *et al*., 2021). Orofacial pain is often confused with pain from temporomandibular joint disorders. Since third molars are the last teeth in the dental arch to erupt, it is believed that they are one of the causes of orofacial pain (MKSOUD *et al*., 2020). Misdiagnosis in real cases of orofacial pain can evolve into chronic pain, limiting patients to perform their daily tasks, in some cases can also trigger depression. Thus, the dental surgeon must seek information about the duration and intensity of pain to differentiate it from the discomfort caused by impacted third molars (MKSOUD *et al*., 2020; PERES *et al*., 2021).

MANDIBULAR FRACTURES: The mandibular bone is strong and large among the facial bones, it has as one of its main functions to support occlusal masticatory loads and in addition all masticatory muscles are inserted in it, thus its structure becomes easily susceptible to fracture in relation to the other bones (AL-SHARANI *et al*., 2021; MEHRA *et al*., 2019). In the mandible, when there are molars, bone quality and angle bone mass is reduced, making it more fragile. The lower third molars, when positioned in a way that will generate discomfort or some pathological problem for the patient, its removal is indicated. Factors such as the patient's age, systemically compromised individuals and when the element is close to noble structures, its removal is contraindicated (LIMA *et al*., 2017; MEHRA *et al*., 2019; GIOVACCINI *et al*., 2018). Mandibular fractures, even if rare, can be caused during surgery to remove the element, using the second or third surgical technique. In the second technique, the use of excessive force of the levers for its removal is contraindicated, and in cases where the element is extremely included, the mandible is already weakened, and the probability of fracture is greater (LIMA *et al*., 2017). It is observed that the procedural techniques for removing the elements, when not performed correctly, the probability of fracture of the mandibular bone is higher, thus, with incorrect management, the patient's clinical condition becomes infectious and requires more treatment. invasive, leading to the need for hospitalization (LIMA *et al*., 2017).

DENTAL INFECTIONS: Odontogenic infections are considered polymicrobial from dental and periodontal tissues, affecting the head and neck region and may be localized or generalized, symptomatic or asymptomatic. These infections are usually limited to their region of origin, but when the patient has a drop in immunological resistance, the purulent secretion leaks to other body regions, expanding to the chest cavity, similar to a fulminant infection (SILVA *et al*., 2017; CONCEIÇÃO *et al*., 2019). The mandibular third molars present in the oral cavity or after their surgical removal are considered factors capable of triggering an infection which expands in the submandibular, retropharyngeal and mediastinal sites that compromise the patient's systemic health, requiring immediate intensive treatment, in cases of a diagnosis later, the success rate is low and may lead to death (SILVA *et al*., 2017). Descending necrotizing mediastinitis can be classified as an odontogenic infection with a high level of danger, with a mortality rate of 50%. Cavernous sinus thrombosis, Ludwing's angina, sepsis, orbital cellulitis and bacterial endocarditis are other odontogenic infections of dental and periodontal origin considered serious that require treatment in an intensive hospital environment to reverse the clinical picture, saving the patient's life (CONCEIÇÃO *et al*., 2017).

CARIOUS INJURIES: One of the consequences of an impacted third molar is to unintentionally affect the propinum molar. This element may not always be directly linked to the cause of distal caries found in lower second molars. However, in cases where this element is found in angulations such as mesioangular, horizontal, classes I and II, they help the element to predispose to caries disease (PENTAPATI *et al*., 2019). The cemento-enamel junction of the second molar is in close contact with the element that is impacted, making cleaning difficult, not completely removing the bacterial plaque and rest of food, consequently there is an increase the probability of caries in the distal region of this second molar. In addition to the loss in the amount of lamina dura (alveolar bone) (PENTAPATI *et al*., 2019). There is a debate among dental surgeons whether or not they perform prophylactic extraction of this element, so that they do not damage the second molars, as they are the ones that support the greatest masticatory load. One of the arguments for prophylactic third molar removal at a younger age is that it helps the patient for faster and better healing (CHOU *et al*., 2017).

PERICORONARITIS: The angulation of eruption of third molars is one of the factors responsible for triggering periodontal pathologies. Third molars that present the mesioangular angulation develop a probing depth and clinical insertion level in the distal and mesial sites of the extremely high second molars, in opposition to the other angulations, indicating periodontal dismantling of the second molar (SINGH *et al*., 2020). In the horizontal angulation, in most cases not much periodontal damage is found, but bone resorption of the distal bone crest of the second molar is common to occur in relation to the mesioangulated elements, however, according to Nogueira (2020), it was reported that the vertical angulation stands out for having a predisposition to periodontal destruction of the adjacent second molar. In addition to the presence of periodontal pockets, marginal bone resorption of adjacent second molar roots, clinical attachment loss, significant bacterial plaque accumulation, and gingival bleeding. Singh (2018) analyzed the angulation of the third molar and the one that most negatively stands out when deep examinations are performed, the probing is the mesioangular probing, associated with retention of bacterial plaques, and not only compromise the third molars but also critically affect the stability of the second molars, which can lead to permanent loss of the two elements involved.

ADJACENT MOLAR RADICULAR RESORPTION: The third molars, as already said, as they are the last teeth to erupt in the oral cavity, it is common that there is not enough space for their eruption, therefore these dental elements are constantly impacted, causing the resorption of the adjacent molars (LACERDA-SANTOS *et al*., 2018). This process occurs more frequently in the mandible due to lack of space in this region. Root resorption involves the removal of cementoblasts and exposure of the mineralized root surface, which takes place without presenting painful symptoms (LACERDA-SANTOS *et al*., 2018).

Direct contact of impacted third molars with adjacent molars can be diagnosed through imaging tests, such as computed tomography, based on this assessment, the dental surgeon can start the treatment plan (WANG *et al*., 2016).

DISCUSSION

Impacted third molars are elements that tend to have several factors that cause discomfort to the patient, Smailiene *et al*. (2019) says that a large part remains asymptomatic for several years in the oral cavity and, therefore, it is necessary to carry out periodic exams to assess their clinical condition. Analyzing the position of the third molar Winter (1926) classifies it as mesioangular when the element meets with the crown of the third molar facing mesial and vertical when the axis of the lower third molar is parallel to the axis of the lower second molar. Matos *et al*. (2017), based on their study, says that the mesioangular position (43%) is the one that most causes impaction of the third molar in relation to the vertical (38%), while Franco *et al*. (2018) in their research states that the position that is most prevalent in impactions is the vertical (60.36%) compared to the mesiaoangular (27.56%). Prophylactic removal is a widely discussed topic in the literature and each case must be individualized according to Smailiene *et al*. (2019), in the same sense Singh *et al*. (2016) states that the indications for prophylactic third molar extraction are controversial. Despite this, the extraction of this element, even when there is no diagnosis with future complications, is frequently performed in dental clinics. For Santos *et al*. (2021) most impacted molars remain asymptomatic and do not present any damage to the structures around them, on the other hand Medina *et al*. (2017) and Smailiene *et al*. (2019) share the same thought that impacted molars must be removed due to their difficult cleaning and possible complications, as they lead to periodontal diseases causing bone defects in the distal second molar, root resorption of the second molar, in addition to preventing the appearance of cysts and tumors. The vast majority of cysts and tumors are asymptomatic, with lower prevalence in upper third molars and higher prevalence in lower ones, according to studies by Moldovan *et al*. (2020). Kim *et al*. (2020) states that the diagnosis of cysts and tumors has a higher incidence in elderly patients because they have some surgical limitations due to their bone cortical being more calcified, thus making the surgery more invasive, the postoperative period with a higher degree of inflammation , and slower healing time. On the other hand, Mattos *et al*. (2017) reports that in young people the incidence is lower because prophylactic removal is performed when impacted third molars are found, as they present a better surgical response, both during the procedure and in the postoperative period.

Kim *et al*. (2020) reported in their research that odontogenic infections are limited to their origin, however they are accompanied by inflammation and swelling, with this occurring absence of intravascular coagulation at the site, necrotizing the tissue. For Bogacz *et al*. (2019) the microbiology of the oral cavity contains aerobic and anaerobic, gram-positive and negative species, which makes antibiotics impossible to fight them all. And Figueiredo *et al*. (2019) complete that surgery to remove impacted third molars is properly medicated by the dentist in order to reduce postoperative risks and infections. The patient, in turn, needs to maintain their care as directed, but in some cases the patient may have odontogenic infections and for a better treatment it is necessary to diagnose the species of bacteria that are present in the infection for an effective drug therapy. According to Singh's (2018) analysis, the angulation of the third molar that stands out most negatively when deep examinations are carried out is the mesioangular one, associated with retention of bacterial plaques, and not only compromises the third molars but also affects them in a way The stability of the second molars is critical and can lead to permanent loss of the two elements involved. Tsvetanov (2018) and Thapa *et al*. (2017) support the thesis that the third molar, when found in Winter's vertical angulation or Pell & Gregory's IA position, present a higher rate of pericoronitis. In dental chronology, third molars are the last teeth to erupt in the oral cavity, most of these elements are impacted, thus predisposing to trigger carious lesions when they are in close contact with the adjacent molar (LACERTA-SANTOS *et al*., 2018). That said, Pentapati *et al*. (2019) believe that this element is not always the reason for the appearance of caries on the distal face of second molars. In a study by Al-Ramil *et al*. (2018) found a 23.1% rate of carious lesions associated with impacted third molars and caries on the distal surface of adjacent second molars between 11.5% and 42.5%. Second molar root resorption caused by the position of the retained third molar isa pathology that is only diagnosed through imaging exams, and for a good prognosis it is extremely necessary that the evaluation be carried out as soon as possible, to avoid endodontic treatment or even its loss, despite the position of the third molar being a of the main causes for extensive root resorption, other factors such as inflammatory processes and physiological characteristics can also cause this complication (LACERDA-SANTOS *et al*., 2018). Second molar root resorption for Smailiene *et al*. (2019) is found more in the mandible than in the maxilla, since the lack of mandibular space is one of the factors that most cause the incidence of impacted molars, however the growth of the maxillary tuberosity and the mesialization of the elements give more space for the eruption of the upper molars. Surgeries that involve removal of third molars, as they have a vast degree of complications, it is necessary that the professional study the treatment plan to apply the best operative technique, being the most correct way to perform any procedure, as the surgeon has to be able to perform it, thereby reducing the risk of complications for the patient both in the trans- and postoperative period (LIMA *et al*., 2017; WANG *et al*., 2016).

CONCLUSION

In accordance with this literature review, surgeries that involve the extraction of third molars, due to a vast degree of complexity, require a detailed anamnesis, accompanied by imaging exams, in order to carry out a precise surgical plan. In this way, the dental surgeon will be able to avoid complications and prevent the worsening of these pathologies.

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