

**SURGICAL TREATMENT OF IMPACTED PREMOLAR
IN REVERSE POSITION
THROUGH EXTRA ORAL ACCESS -
CLINICAL SURGICAL CASE REPORT**

**TRATAMENTO CIRÚRGICO DE PRÉ-MOLAR RETIDO
EM POSIÇÃO INVERTIDA
POR ACESSO EXTRA BUCAL -
RELATO DE CASO CLÍNICO CIRÚRGICO**

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ABSTRACT

Treatment choice for solving impacted teeth should be made after careful clinical and radiographic evaluation. Surgical exposure followed by orthodontic treatment is surgical procedure most commonly used for these cases. Early diagnosis can minimize problems that tooth retention may cause, such as root resorption of neighboring teeth. This study aims to address planning, diagnosis, orthodontic treatment and surgical aspect of these teeth and gum for the resolution of cases to be treated and orthodontic surgery.

RESUMO

Plano de tratamento de dentes retidos deve ser sempre realizado após criteriosa avaliação clínica e radiográfica. Tratamento ortodôntico cirúrgico é procedimento mais utilizado para este tipo. Diagnóstico precoce pode prevenir problemas resultantes da retenção dental como dor, transtornos oclusais, infecciosos e periodontais, neoplasias e reabsorções radiculares de dentes vizinhos. Estudo visa abordar planejamento, diagnóstico, tratamento ortodôntico e cirúrgico destes dentes, além do aspecto periodontal para resolução de casos a serem tratados ortodôntico e cirurgicamente.

Uniterms: Impacted teeth; Tooth traction; Orthodontic treatment.

Unitermos: Dente Retido; Tracionamento; Tratamento Ortodôntico.

INTRODUCTION

Tooth eruption is physiological process occurring with impeccable accuracy in humans. Deciduous and permanent teeth form inside maxillary bones and after certain period of time, they erupt in sequence established by nature, in order to fulfill one of its main functions like chewing. However, in some occasions, this mechanism fails or is interrupted resulting in dental impactions and malocclusions. When it comes to prevention, undoubtedly the most important thing to consider is the surgeon's preparation, both from the anatomical point of view, since the professional needs to have full knowledge of the anatomy involved in region, as well as to lay hands and know (NOUEL, 1993 and MARZOLA, 2008).

Interpret diagnostic resources used for this purpose-as technician-where it is indispensable to understand different surgical techniques, its indication for each case, as well as, excellent manual ability to execute it (**MARZOLA, 2008 and COLAKOGLU; HAMAK; OKTAY, 2010**).

Ectopic eruption is change in the normal course of eruption of dental germ, occurring at any time. Third molars and the upper canines are the teeth that present disturbances in the path of eruption with greater frequency (**MARTINEZ; WALKER; MENEZES, 2007 and MARZOLA, 2008**).

Present work aims to direct clinician through simple and methodical diagnostic sequence, allowing realization of logical and balanced treatment plan. Subsequently, clinical case of patient with ectopic impacted teeth and its respective treatment will be exposed.

LITERATURE REVIEW

Impacted teeth are those that, once normal time of eruption has arrived, are partially or totally enclosed within the bone tissue, with or without the integrity of pericoronal sac. Surgical treatment for removal of third molars is one of most difficult interventions in dental surgery (**MARZOLA, 2008**). Surgeries for removal of impacted teeth are erroneously termed "*minor oral surgeries*", requiring professional who is qualified to do so, deep knowledge and skill, and occurrence of accidents and complications due to use of planning and interventions is uncommon incorrect (**ZANINI, 1990 and MARZOLA, 2008**).

Impaction teeth may affect any dental germ, however, third molars and upper canines seem to be more frequently impacted than others (**MARZOLA, 2008 and SANDRIN; ZORZETTO; MARZOLA et al., 2008**).

Dental impaction is phenomenon with frequency and three main causes are listed, such presence of mechanical obstacle, pathologies of dental organ itself, preventing it normal development, presence of supernumerary teeth, and conjugation of two previous phenomena (**PEREIRA; FERREIRA, 2008 and MARZOLA, 2008**). Teeth that appear to be most frequently impacted are third molars (90%), followed by upper canines (5%), lower and supernumerary premolars (5%). Upper canines are those most frequently impacted (**MARZOLA, 2008**). Second lower premolar is most frequently impacted tooth after third molars and upper canines with incidence of 2.1 to 2.7% (**OIKARINEN; JULKU, 1974**). Although infrequent, pre-molar retentions represent 8%, being more prevalent in females and, in most cases, unilateral (**ESCODA; AYTTEÉS, 1999 and MARZOLA, 2008**). Dental impaction is more frequent in the permanent dentition, and may also be present in decidua,

because during formation and eruption of teeth, child is subject to several local and systemic factors, which may result in retention of one or more teeth (**SANTANA; FERREIRA; PINZAN, 2000 and MARZOLA, 2008**).

Determining factors may be local or general. In places, there is lack of space, an altered skeletal relationship, poor position of adjacent teeth, early loss of temporaries, traumas in childhood, prolonged permanence of deciduous teeth, presence of mechanical obstacles such as odontomas or cysts, primary rotation of the germ and closure early root apex. As general, there may be systemic pathologies that may interfere negatively in formation and development of dental germ, and febrile diseases, endocrine disorders, hypovitaminosis, congenital syphilis, and ankylosis of temporomandibular joints (**MOTTOLA, Malferrari, 1999; GIUBLIN; WEBBER; TANAKA et al., 2001 and MARZOLA, 2008**).

Authors consider lower third molars, those most frequently impacted, therefore, they are more associated with disorders such as odontogenic cysts, dental mobility and root resorption of neighboring teeth. Because of the advances in techniques that allow early diagnosis, its extraction has become common and routine procedure for bucco-maxillofacial surgeon (**ELIASSON; HEIMDAHL; NORDENRAM, 1989; RICHARDSON, 1998 and MARZOLA, 2008**).

Surgeries for removal of impacted teeth are not simple procedures, since they require surgeon to have good training and knowledge of anatomical structures related to dental element. It is of fundamental importance in planning of intervention, determination of exact positioning of impacted tooth, extension of osteotomies, evaluation of need for odontosections, aiming at interventions with less operative trauma. Prevents postoperative accidents and complications such as hemorrhages, trauma, nerve structures involvement, root fractures, damage to neighboring teeth, bone fractures, pain, edema and infection. Impaction classifications based on complementary imaging tests have facilitated establishment of techniques and resources for extractions (**MARZOLA, 2008**).

Systems of impacted lower third molars are recommended for angulation in relation to ascending mandible ram and to occlusal plane, and assisting in selection and planning of most adequate surgical technique (**SANTANA, FERREIRA, PINZAN, 2000 and MARZOLA, 2008**).

Winter classification takes into account orientation of long-axis of impacted third molar relative to that of second molar, describing seven forms of positioning. Pell and Gregory classification refers to space existing between the branch of mandible and face of second molar, and to relative depth of third molar impacted in relation to second molar, being classified in Class I, II and

III in relation to the ram, or Class A, B and C when compared to occlusal plane (OLIVEIRA, 1992; MOTOLLA; MALFERRARI, 1999 and MARZOLA, 2008).

Removal of frequently impacted teeth follows established surgical protocols of mucoperiosteal flap and ostectomy. However, there are some teeth that need removal, not being routine cases. In these situations, surgeons should use their knowledge and skills in alternative techniques for completing procedure (MILANO; LAWRENCE; MARSHALL, 1996 and MARZOLA, 2008).

Various treatment options such as exposure and orthodontic traction, transplantation, follow-up and, surgical removal, are dependent on factors such as incomplete rhizogenesis, patient age, and degree of retention. If impacted canine is diagnosed early, it is possible that reaching it in better position in dental arch with orthodontically assisted eruption, however, is long and expensive treatment, requiring careful selection and preparation of patient, in addition to interaction / cooperation between the orthodontist and the surgeon. When orthodontic treatment is not successful, surgical removal of impacted tooth is indicated or, depending on indication, its transplantation is indicated (MARZOLA, 2008 and COLAKOGLU; HAMAK; OKTAY, 2010).

CD must know the macroscopic and radiographic anatomy of mandibular canal with its variations to correctly plan the surgery of its patients and, in this way, avoid deleterious results, solving the problem, if it occurs (MARZOLA, 2008).

Mandibular canal transmits artery and inferior alveolar nerve, branch of third division of trigeminal nerve, from mandibular to mental foramen (BERBERI; MANI; NASSEH, 1994 and JERGES; SWINSON; MOLES *et al.*, 2006).

Panoramic radiographic examination is very useful to identify and classify anatomical variations of mandible canal. However, it should be used with caution due to its limitations in terms of distortion and bi-dimensionality (DEVITO; TAMBURUS, 2001).

Periapical radiographs provide images of dental with minimal distortion. Because recording surface of image (film) is close to object to be radiographed during its performance, better visualization of anatomical details is obtained in comparison to panoramic radiograph (SILVA, 2007).

Size and position of tooth, its length, number and shape of roots, space of periodontal ligament and its relation with adjacent noble structures can be better evaluated using periapical incidence (SILVA, 2007).

Conventional orthopantomography (OPG) has been recommended as the preliminary investigation of choice in preoperative assessment of lower third molars. However, it lacks diagnostic information regarding certain

anatomical relationships and for planning of treatment of difficult impaction (JHAMB, 2009). When panoramic image is suggestive of an intimate relationship between impacted tooth and mandibular canal, medical computed tomography should be recommended for further investigation to demonstrate three-dimensional relationship between two structures (DHARMAR, 1997 and MARZOLA, 2008).

Computed tomography of cones reduced risk significantly compared to traditional computed tomography, considerably reducing radiation load. There was also potential benefit for patient with reducing risk of injury to alveolar nerve. Surgeons who have used 3D images have reported that they approach surgery with significantly reduced level of stress in difficult cases, and that operating time may be slightly reduced. Lower level of stress can bring an additional benefit to patient in reduction of injuries, besides direct benefit to dentist because he knows exactly where are vital structures (APINHASMIT; METHATHRATHIP; CHOMPOOPONG *et al.*, 2006 and AMINOSHARIAE; SU; KULILD, 2014).

Alternative method is described in an 11-year-old young patient impacted by the second lower right premolar using attractive samarium-cobalt magnets glued with light-curing resin on impacted tooth's buccal surface and another rigid magnetic pole embedded in a Strap band device. Authors report that magnets employed generated continuous and autonomous force field, with no need to use metallic wires as guides for irruption or traction elastics. Deimpaction occurred over period of 40 days, requiring two magnetic activations by magnet approximation, concluding, therefore, that method was quite effective both in relation to treatment time and in relation to comfort provided to patient (SISENANDO; NELCY; LUIZ *et al.*, 2006).

SURGICAL CLINIC CASE RELATE

26-year-old female, C. N. M., leucoderma, was referred by CD to Buco-Maxillofacial Surgery Clinic. There was no complaint of pain by patient and, when requesting panoramic radiograph, it was found that she had impacted tooth and was referred for treatment. At extra buccal physical examination, there was no evidence of clinical changes. Intraoral examination revealed absence of element 35 and panoramic radiograph presented by patient showed presence of impacted element (35) in inverted position, at level of base of left mandible (Figure 1).

In view of clinical symptomatology, was perform surgery, being requested all routine preoperative exams and surgery conducted under general

anesthesia. After anesthesia by regional and infiltrative block with 0.5% adrenaline Bupivacaine Hydrochloride solution (MARZOLA, 2017), incision was made with slide 15 along, with incision design oriented by the expression lines of the face (Figure 2). Detachment was performed with Obwegeser's rutsins, and flap was held in place with appropriate retractors (Figures 3 and 4).



Figure 1 - Radiographic appearance of the inverted impacted premolar.

Source - Private collection of FERREIRA-JR.



Figure 2 - Incision aspect.

Source - Private collection of FERREIRA-JR.

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Figure 3 - Aspecto f the mucoperiosteal detachment.

Source - Private collection of FERREIRA-JR.

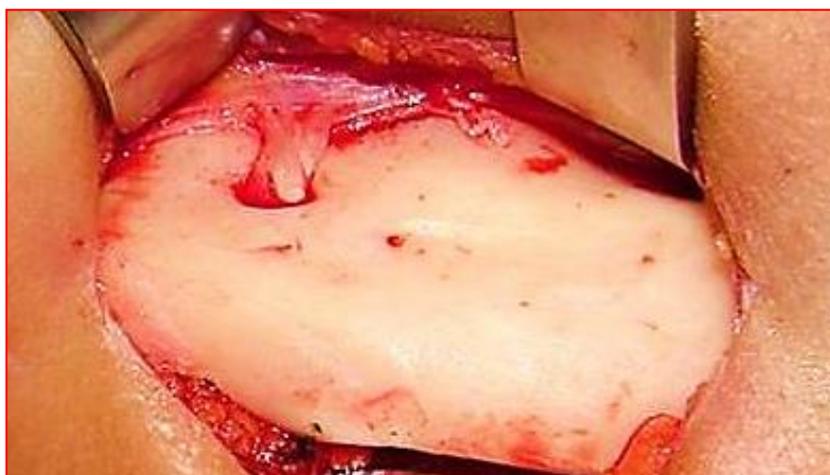


Figure 4 - After the mucoperiosteal detachment note the mandible base.

Source - Private collection of FERREIRA-JR.

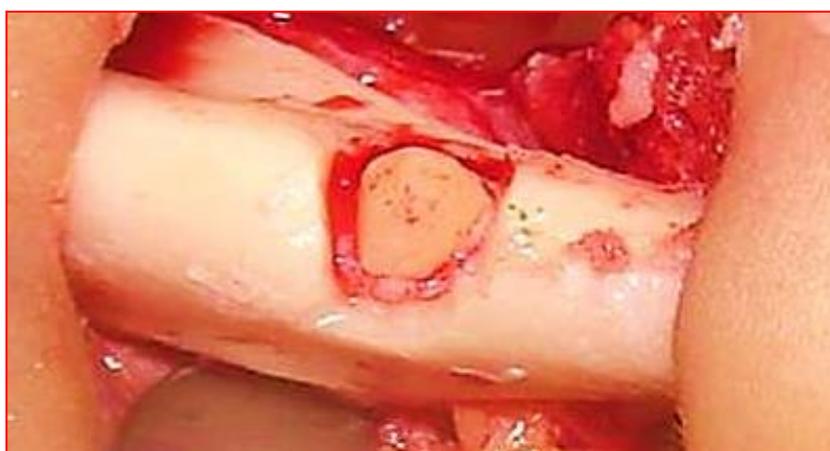


Figure 5 - Osteotomy/Ostectomy.

Source - Private collection of FERREIRA-JR.

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With drill bits 702-703, coupled to surgical motor handpiece, osteotomy / ostectomy was begun to expose crown and part of root portion of 48 (Figure 5).

Dislocation with Seldin's extractors, was delicately undertaken before starting odontosection maneuvers, initially conducted through number 707 diamond tips and complemented with 702 drills. Double-traced odontosection, initially performed through crown-root tracing, allowing removal of crown and root of impacted premolar, so as not to transfer greater efforts to fragile surrounding bone walls (Figures 6 and 7).

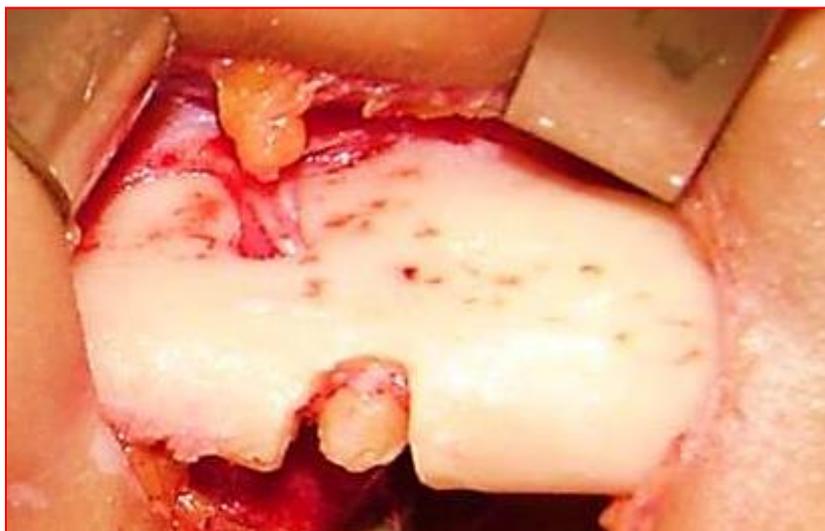


Figure 6 - The crown of premolar in the mandible base.

Source - Private collection of FERREIRA-JR.

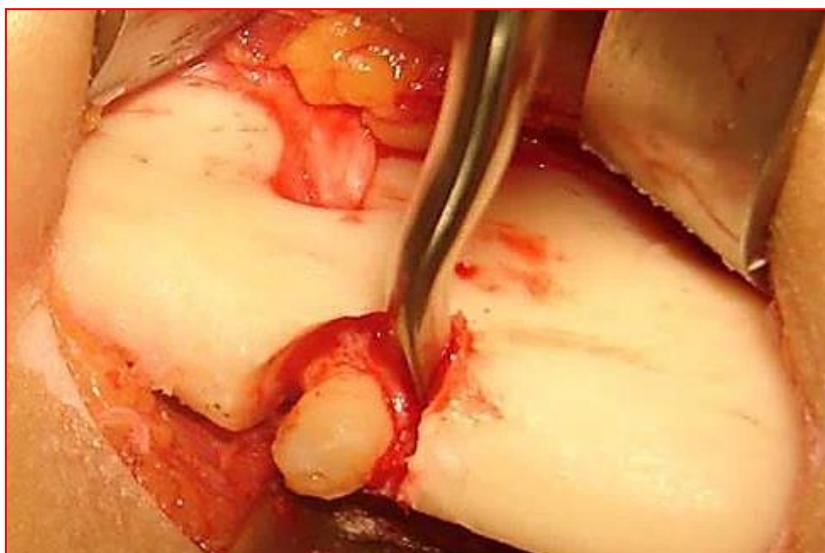


Figure 7 - Luxation moment.

Source - Private collection of FERREIRA-JR.

Premolar removal (**Figure 8**), stable internal fixation with plate, screw and, titanium mesh, molded in the surgical act was performed (**Figure 9**), and the wrapping with absorbable membrane (**Figure 10**).



Figure 8 - Premolar removed.

Source - Private collection of FERREIRA-JR.

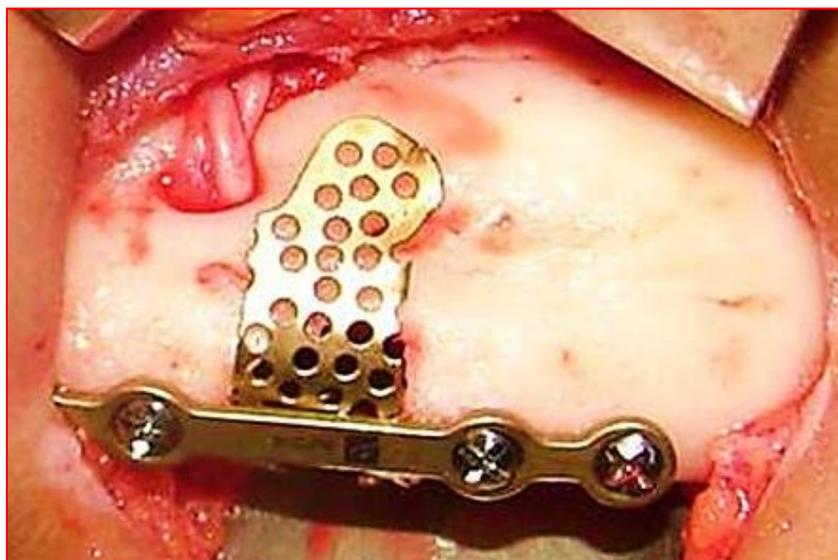


Figure 9 - Stable internal fixation with plate, screw and, titanium mesh.

Source - Private collection of FERREIRA-JR.

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Figure 10 – Absorbable membrane adapted.
Source – Private collection of FERREIRA-JR.



Figure 11 – Final suture.
Source – Private collection of FERREIRA-JR.



Figure 12 – Radiographic control after 30 days of treatment.
Source – Private collection of FERREIRA-JR.



Figure 13 – Healing wound aspect after 30 days.

Source – Private collection of FERREIRA-JR.

Concluded with synthesis by tissue layers, to avoid possible imperfections in healing, compromising facial esthetics (**Figure 11**). It was followed by radiographic control and healing wound aspect after 30 days of treatment (**Figures 12 and 13**).

DISCUSSION

Impacted teeth surgery represents widely performed treatment in dentistry. Demand for this procedure grows every day in world. However, in order to proceed without major problems, adequate preoperative planning should always be perfectly performed (**MARZOLA, 2008 and SAMPIERI, 2011**), as can be seen in case presented. Professionals dentistry in all areas, during routine examinations or in their treatments, do not rarely come across retained elements, positioned or not ectopically. Most common choice for this type of treatment is surgical orthodontic, aiming to position tooth in arch without causing periodontal damage (**MARZOLA, 2008 and GASPARIN; ZORZETTO; MARZOLA, 2013**), corroborating the presented case.

Among authors who defend prophylactic exertion of impacted teeth, since there is possibility of associated development of pathological lesions, being one of main points of prominence (**GOMES; DIAS; BEZERRA et al., 2004 and MARZOLA, 2008**). Verified by reported case. Although they are not very frequent, alterations are inflammatory-infectious, cystic or tumorous, susceptible of affecting these teeth, deserve attention on part of professional, due to high degree of morbidity, including with possibility of permanent deficit to life of patient. Pathologies that develop in association with these teeth can be of great value, including predisposing to development

of malignant alterations (**MOTTOLA; Malferrari, 1999; Giublin; WEBBER; TANAKA et al., 2001 e MARZOLA, 2008**). Report shown.

Non-viable teeth in terms of position or shape, are candidates for extraction with posterior orthodontic and prosthetic monitoring (**BURCH; NGAN; HACKMAN, 1994 and MARZOLA, 2008**). Approach can be intra-or extra-oral depending on location of tooth (**ALLING; CATONE, 1993 and MARZOLA, 2008**). In general, intra-oral is preferred because, although providing more limited surgical field, it does not leave aesthetic sequels and also does not run the risk of damaging the facial nerve. However, if tooth is in position that is difficult to access, such as at angle or the lower edge of mandible, for example, oral extra may be more appropriate (**BURCH; NGAN; HACKMAN, 1994 and MARZOLA, 2008**). Removal at an age of about 18 years when the root of germ has two-thirds of its total length may be better indicated (**PETERSON; ELLIS; HUPP et al., 2000 and MARZOLA, 2008**).

Other authors indicate conservative conduct with clinical and radiographic follow-up of tooth for an indeterminate period of time, because some teeth assume positions that may complicate surgical treatment (**COLAKOGLU; HAMAK; OKTAY, 2010 and MARZOLA, 2008**). Completely seen by presentation of presented case. With regard to radiological aspects, it is only useful when its results, whether positive or negative, are still to be found in patient's clinical history and in clinical examination of teeth (**MARZOLA, 2008 and GASPARI; ZORZETTO; MARZOLA, 2013**). Modify or reinforce diagnosis (**MARZOLA, 2008 and AMINOSHARIAE; SU; KULILD, 2014**), which can be clearly shown and corroborated with case presented. Cone-Beam Computed Tomography has not yet been widely adopted in dentistry probably in part because of lack of familiarity of CDs with technique and difficulties resulting from reading and interpreting images that are bit Blurry. Is necessary that CD seeks new knowledge and becomes familiar with new modalities of radiographic examination such as computed tomography and magnetic resonance, to know how to correctly interpret these exams and even know right moment to use them (**DHARMAR, 1997; APINHASMIT; METHATHRATHIP; CHOMPOOPONG et al., 2006; MARZOLA, 2008 e AMINOSHARIAE; SU; KULILD, 2014**). Results of this study are in accordance with results obtained. Authors have used the argument of surgical difficulty to not indicate excision of impacted teeth. However, current practicality of surgical act, lower operative costs and, modern techniques of diagnosis and surgical planning minimize this difficulty (**ESCODA 1999; GOMES; DIAS; BEZERRA et al., 2004 and MARZOLA, 2008**). Corroborate with case presented.

Immediate postoperative discomfort with occurrence of pain, edema, and bleeding among others as referenced is important occurrence to be analyzed in order to improve the surgical procedure. However, this event does not present significant value when compared to the long-term benefit provided. Immediate postoperative discomfort would be transient step to achieve considerable improvement in long-term quality of life (**ESCODA, 1999; CAPPELLETTE, 2008 and MARZOLA, 2008**). Thus, all this was approached through hypotheses, suggesting good conclusions for closing of this discussion.

Complications caused by the various therapies play very important role when choosing most appropriate treatment plan for patient. Treatment options mentioned above can have number of negative effects. Will refer to specific complications of each treatment, and all that has been approached through hypotheses will suggest good conclusions for closing of this discussion.

FINAL CONSIDERATIONS

Diagnosis of dental impaction with ectopic eruptions allows the CD to make timely use of interceptive treatment in order avoid complications. Lower teeth extraction in this anatomical condition is most used preventive treatment for prevention of mandibular fractures and, usually, orthodontic indications. Surgical approach for exposure of impacted teeth, one must take into account anatomical position of tooth in relation to neural and vascular bundle of inferior alveolar. Induced surgical treatment will provide improvement in results in orthodontic and functional terms, as well as decrease of future complications. Complicated clinical settings require multidisciplinary approach, with involvement of general practitioner and specialists.

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* According of the ABNT norms and modified of the Review of Dentistry of the ATO.