



CASE PRESENTATION

Germenectomy in third molars: a rare case

Germenectomía en terceros molares: un caso poco frecuente

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ABSTRACT

Introduction: surgery of retained third molars usually involves a multidisciplinary approach, with the collaboration of various specialists, such as orthodontists, oral surgeons and sometimes psychologists.

Objective: to present a clinical case of a 15-year-old adolescent girl with indication for germenectomy of her four third molars for orthodontics.

Case presentation: a case of germenectomy of third molars performed before orthodontic treatment is presented in detail, explaining in detail the indications for the intervention, the surgical techniques used, and the associated benefits and risks. This decision was based on a thorough radiographic examination, which revealed the ectopic presence of crowns without root development of the third molars, which could lead to future complications such as crowding and interference with the success of orthodontic treatment. The methodology is based on a complete description of the process, from patient selection and initial clinical evaluation to treatment planning, surgery, hygiene and suturing, postoperative care and case follow-up.

Conclusions: enucleation of the third molar germs was recommended, performing the surgery in a conventional manner and ensuring adequate recovery with the necessary follow-up.

Keywords: Surgery; Tooth Extraction; Molar; Orthodontics; Diagnostic Techniques, Surgical.

RESUMEN

Introducción: la cirugía de terceros molares retenidos suele implicar un enfoque multidisciplinar, con la colaboración de diversos especialistas, como ortodoncistas, cirujanos orales y en ocasiones psicólogos.

Objetivo: presentar un caso clínico de una adolescente de 15 años de edad con indicación de germenectomía de sus cuatro terceros molares por ortodoncia

Presentación de caso: se presenta detalladamente un caso de germenectomía en terceros molares realizada antes del tratamiento de ortodoncia, explicando minuciosamente las indicaciones para la intervención, las técnicas quirúrgicas utilizadas, los beneficios y riesgos asociados. Esta decisión se basó en un minucioso examen radiográfico, que reveló la presencia ectópica de las coronas sin el desarrollo radicular de los terceros molares, lo que podría dar lugar a complicaciones futuras, como apiñamiento dentario y la interferencia con el éxito del tratamiento ortodóncico. La metodología se basa en la descripción completa del proceso, desde la selección del paciente y la evaluación clínica inicial hasta la planificación del tratamiento, la cirugía, la higiene y las suturas, los cuidados postoperatorios y el seguimiento del caso.

Conclusiones: se recomendó la enucleación de los gérmenes de terceros molares, realizando la cirugía de manera convencional y se aseguró una adecuada recuperación con el seguimiento necesario.

Palabras clave: Cirugía; Extracción Dental; Terceros Molares; Ortodoncia; Técnicas de Diagnóstico Quirúrgico.

INTRODUCTION

One of the most variable teeth in terms of its formation and eruption is the third molar. Tooth mineralization follows an invariable sequence that starts from the uppermost parts of the cusps, then progresses to crown formation, then with root development and ends with apex closure. The lower third molars go through this process between eight and 20 years of age. These molars erupt during early adulthood, usually between the ages of 17 and 21.⁽¹⁾

There is a theory of terminal tooth reduction, which explains the eventual disappearance of the third molars in the human species as an evolutionary result of the decrease in chewing activity. This would result in a smaller number of teeth in the arch. The germ of this molar is a concern for the dentist when it does not have enough posterior space in the mouth for its eruption, thus causing some complications for the patient.⁽²⁾

The term germenectomy refers to the removal of a dental element during its growth, when the crowns and roots have not yet completed their development. It is an elective surgery, performed after an accurate diagnosis and as part of specific treatment strategies. Its application is especially relevant with regard to the lower third molars, which have a high probability of being impacted according to their stages of development.⁽³⁾

The lower third molars are the most frequently impacted teeth in the human population. The absence of eruption of wisdom teeth is detected when they cannot emerge due to an obstruction of osseous or dental origin. In certain situations, the obstruction of tooth eruption can affect the second molar, given that the coronal maturation of the third molar culminates around 12 years of age, coinciding with the eruption of the second molar. Depending on the orientation, angle and size of the wisdom tooth crown, it may hinder the eruption of the second molar.⁽⁴⁾

Germenectomy is indicated in the following cases:^(1,5)

- To gain space in the posteroinferior segment, when the objective is to distalize the first or second molar.
- Crowding in the mandibular anterior area, where the absence of space for the eruption of the third molar is expected.
- Impaction of the second molar because of the third molar.
- Caries, periodontitis, occlusal defect, pericoronaritis, root resorption of the second molar, cellulitis, cysts, abscesses, temporary local swelling, pain, trismus and temporomandibular joint problems.

The lower third molars show the highest incidence of impaction and have been considered responsible for pathologies such as pericoronaritis, periodontitis, second molar crown resorption, pain, odontogenic cysts or tumors, primary or secondary crowding of the dentition. Early extraction of these teeth is to prevent the above mentioned problems, as many studies demonstrated a direct correlation between age and the incidence of complications.⁽⁶⁾

Partially erupted third molars are indicated for extraction. Third molar surgery has higher morbidity compared to other dental extractions. Therefore, postoperative sequelae such as neural disruption, pain, swelling, and trismus are more common in this type of surgery.⁽⁷⁾

In Pell & Gregory's classification in 1933, third molar impaction is classified according to its depth level in relation to the occlusal surface of the second molar vertically, and the relation of the impaction to the branch body horizontally. In terms of angulation, third molar impaction was classified by Winter's classification system in 1926. It is based on the angulation of the axial axis of the third molar tooth with respect to the axial axis of the second molar. This classification provides an initial assessment of the difficulty of extraction.⁽⁸⁾

Pell and Gregory classification of the impacted third molar. It determines the degree of impaction of the lower third molars, the depth in relation to the occlusal plane of the lower second molar (position A, B or C) and of the mesiodistal diameter of the impacted tooth in relation to the distance of the lower second molar and the anterior part of the mandibular ramus (Class I, II or III).

In terms of the complexity of the procedure, germenectomy cannot be performed in the usual way as simple extractions, requiring certain additional techniques or maneuvers such as osteotomy (procedure to remove the bone surrounding the tooth to gain access to the molar to be treated) or/and odontosection (division of the tooth to remove it by fractions of the alveolus). Both techniques can be used for complex extractions.^(9,10,11)

Treatment of growing patients usually involves a multidisciplinary approach, including collaboration with various specialists such as orthodontists, oral surgeons and sometimes psychologists. Providing accurate information about the performance of the surgical procedure helps all of these professionals to optimize the coordination of the treatment plan for the young patient. Ideally, at the end of orthodontic treatment, a stable dental status should be achieved, avoiding the need for future interventions.

It should be recognized that further research in scientific knowledge is still needed. The existing literature often does not sufficiently describe the intraoperative difficulties and possible postoperative complications associated with this surgery. With this in mind, this case report provides an in-depth analysis of the main issues and key considerations in the early extraction of a developing third molar.

Based on the aforementioned, the purpose of this paper is to present a case with indication of germenectomy for orthodontic third molars in a 15-year-old adolescent girl and thus argue the importance of preoperative analysis and examinations, interconsultations with specialists for the correct diagnosis and timely execution of the treatment plan to avoid future complications in orthodontic treatment.

CASE PRESENTATION

Female patient, 15 years old, presented to our clinic with the purpose of extracting her third molars as part of her orthodontic treatment. During the clinical examination, the presence of the third molars was not evident. However, a panoramic radiograph showed that the germs of the four third molars were in an ectopic position and retained in the bone tissue (Figure 1).

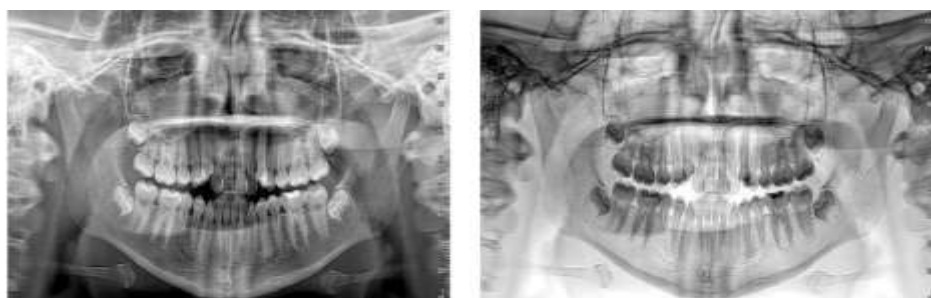


Fig. 1 Panoramic radiograph showing the presence of the four third molar germs.

Orthodontic treatment in patients with ectopic and retained third molars involves careful consideration for their extraction. In our patient's case, the extraction of the dental germs of the four third molars was planned to prevent future problems such as dental crowding and to ensure successful orthodontic treatment.

Based on radiographic findings and thorough planning, the need to extract the third molars' germs was determined due to their ectopic position and the potential risk of future complications, such as pressure on adjacent teeth, causing tooth movement after orthodontic treatment, pain and swelling during eruption.

The extraction procedure was performed under local anesthesia in the upper jaw and regional anesthesia in the lower jaw to ensure comfort and minimize any discomfort during surgery (Fig. 2).



Fig. 2 Application of truncal anesthetic technique.

Articaine 4 % with epinephrine 1:100,000 (*Artheek® - New Stetic, Colombia*) was used. The incision was made with the same principles of the traditional technique, using a 15c scalpel blade (*SMI© - SMI. Belgium*) together with a #3 scalpel tip (*Quinelato-Brazil*) (Figure 3).



Fig. 3 Surgical instruments field.

Surgical instruments

- 1 Minnesota retractor,
- 2 Senn Muller Romo retractor,
- 3 Carpule syringe with suction,
- 4 Long needles 27, 5 Anesthetic,
- 6 Tungsten carbide round burs #8, 7 Apical Elevator #8, 7 Apical Elevator 301, 8 Heidbrink Elevator 2, 9 Heidbrink 3 Elevator, 10 Apexo302 Elevator, 11 Seldin 2 Elevator,
- 12 Molt Decolorator,
- 13 Disector duplo,
- 14 Lucas Curette,
- 15 Bone file,

16 Kelly scissors,
17 Round angled scalpel tip No. 5^a.
(All the instruments are from Quinelato - Brazil).

The flap lifting is carried out with the same principles as the conventional surgical technique until an adequate exposure is achieved to perform the osteotomy and odontosection, the objective is to create an optimal visualization of the surgical area.

An *NSK Surgic Pro-Led* surgical motor was used for the osteotomy, which was performed with great care in order to preserve the periodontium of the second molar, for this reason certain modifications are made in this surgical phase. The germs, since they lack root retention, do not require total exposure of their crowns.

For this reason, the osteotomy is performed in the vestibular portion of the crown, ensuring the preservation of the occlusal part and, especially, of the mesial bone section in contact with the second molar. For this reason, it is necessary to observe the radiograph to determine the location and inclination of the germ to determine the starting point for the osteotomy (Fig. 4 A, Fig. 4 B); being the removal of bone tissue was performed with a tungsten carbide round bur #8 (*Jota - Swiss Made. Switzerland*) in the part, as close as possible to the center of the crown towards the distal part, thus preserving the mesial and occlusal part of the crown.



Fig. 4 A-B The X-ray study where the angulation and determination of the center of the third molar germ in relation to the second molar is analyzed.

In addition, the reduction of the surgical opening prevents the germ from rotating freely inside the alveolus, which complicates its removal. For the odontosection a #703 drill (*Jota - Swiss Made. Switzerland*) was used, cutting the center of the crown or as close as possible to it, and then fragmenting the germ in two halves with a straight elevator to remove the fragments, starting with the distal one and the resulting space will allow the removal of the mesial fragment of the germ. The remaining fragments that are products of the odontosection will be removed from the niche with a Kelly type pick. (Figure 5).



Fig. 5 Third molar germs in the root formation stage.

Once the germ removal was completed, the next step was the thorough cleaning of the alveolus, in the same way the steps are the same as the traditional technique. The peri-coronary sac is removed, which provides a clear view of the niche, followed by the filing of the bone edges, in order to eliminate any bone spicule or any rough area, with the aim of avoiding complications in the postoperative period.

Then the final irrigation with 0,9 % sodium chloride is performed to ensure the elimination of debris and residues that may have been left during the previous phases described above, this stage is crucial for the patient to have a favorable healing and thus minimize any risk of infection.

As a final part of the surgical procedure, it involved single stitch suturing, in strategic sites ensuring an adequate alignment of the incision edges, providing a precise closure to allow healing by first intention, that is, a direct healing of the tissues without complications or excessive inflammatory processes. The suture was made with 5/0 non-resorbable monofilament polyamide 6 thread (*Dafilon® - Braun Surgical, S.A. Spain*), thus favoring optimal tissue regeneration (Figure 6).

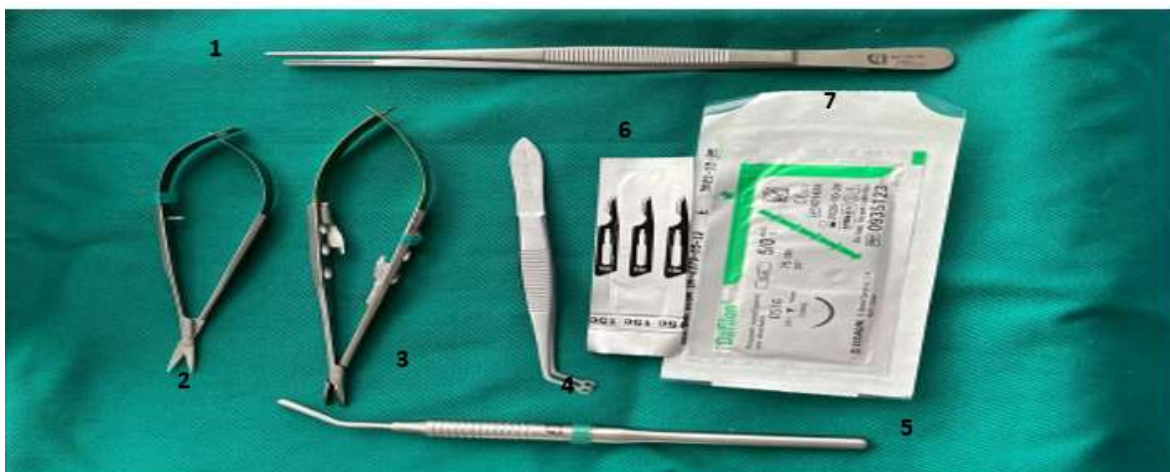


Fig. 6 Suture equipment.

- 1 Dietrich forceps 14cm,
 - 2 Castroviejo scissors,
 - 3 Castroviejo forceps,
 - 4 Suture forceps,
 - 5 Angled round scalpel blade N°5a,
 - 6 Scalpel blade 15c,
 - 7 with 5/0 non resorbable monofilament polyamide thread
6 (Dafilon® - Braun Surgical, S.A. Spain).
- The suture instruments are from Quinelato-Brazil.

Once all the surgical phases were completed, postoperative care was provided to the patient, including care instructions and recommendations for recovery. The pharmacological prescription was antibiotic for seven days (1 gram of amoxicillin + clavulanic acid), NSAID (150 mg Ketoprofen), for four days, application of chlorhexidine gel 0,2 % (Bucagel) from 24 hours to seven days after surgery. In addition, a liquid diet was recommended for the first three days, together with specific indications of oral habits. The was recalled for stitch removal after 15 days.

DISCUSSION

The scientific literature on germenectomy rarely contains detailed descriptions of intraoperative deficiencies and postoperative complications associated with early enucleation of retained third molars, highlighting the complexity of this procedure and the need to understand its clinical implications in depth. Consequently, proper planning and careful consideration are essential to determine a more appropriate approach for each individual case.

In this case, the treatment of choice was the removal of the germs from all four third molars. This decision was based on a thorough radiographic examination, which revealed the ectopic presence of crowns without root development of the third molars, which could lead to future complications such as crowding and interference with the success of orthodontic treatment.

In the review of articles Hartman B and Adlesic EC,⁽¹²⁾ mention that crowding of the anterior incisors is associated with poor arch length, but not with the presence of impacted teeth, although patients who have completed orthodontic treatment may benefit from germenectomy for the prevention of possible adverse outcomes while suggesting that germenectomy is an ideal intervention to prevent impaction of mandibular third molars, which can cause crowding in the anteroinferior area.

The surgical technique of the case was characterized by its conservative and precise approach. The use of local anesthesia, specifically 4 % articaine with epinephrine 1:100,000, ensured patient comfort during the procedure. The incision and the lifting of the flap were performed following principles similar to the traditional technique, allowing adequate exposure of the surgical area. The osteotomy, indispensable for the exposure of the germs, was performed with special attention to preserve the periodontium of the second molar.

An important aspect is the reduction of the surgical window, which prevents the germ from turning freely in the alveolus, thus facilitating its extraction. The odontosection was performed with precision and using specific instruments, allowing the control of the segmentation of the germ and its subsequent removal. The single stitch suture at the end of the procedure ensured precise closure of the incision and promoted uncomplicated healing.

The importance of careful planning and the application of precise surgical techniques in the removal of retained third molars make germenectomy an effective option to prevent future problems such as pathologies and also contribute to the success of orthodontic treatment. However, it is essential to take into account the individual characteristics of each patient and carefully consider the risks and benefits before deciding on the intervention.

Hartman B and Adlesic EC⁽¹²⁾ have concluded that the rate of problems after third molar removal is higher in patients over 25 years of age (pain, inflammation, food accumulation, pus discharge). Gum problems after surgery, such as an increase in the depth of periodontal pockets, occur 51 % more frequently in individuals older than 26 years compared to those younger than 25 years.

Likewise, the prevalence of caries in erupted third molars increases with advancing age. After the age of 25, it is notable that the potential surgical risks associated with third molar extraction are more likely to occur. Germenectomy, on the other hand, results in fewer risks. Although dental evolution may vary from patient to patient, studies in patients aged 9 to 17 years have revealed a significant decrease in the incidence of alveolar osteitis, nerve involvement, second molar damage, and infections.⁽⁶⁾

Staderini E et al,⁽⁵⁾ indicate that female patients are more susceptible to developing postoperative complications, and distally angled third molars or molars with class III impaction are more likely to cause such complications. A significant benefit of germenectomy is the reduced likelihood of alveolar or inferior lingual nerve damage during this type of procedure, because the molar roots have not yet reached full development. Therefore, the connection between a tooth germ and the nerves is practically nonexistent.

Third molar surgery, including germenectomy, carries a higher morbidity compared to other dental extractions. Postoperative sequelae, such as neural disturbances, pain, swelling and trismus, are more common in this type of procedure. Therefore, careful planning and precise technique are required to minimize these adverse effects and ensure a favorable recovery for the patient.

The planning and execution of the treatment was crucial to avoid future problems, such as dental crowding, and to ensure the success of the orthodontic treatment. The extraction was performed under local and regional anesthesia to ensure patient comfort during surgery. While the surgical technique was specifically adapted to preserve the periodontium of the second molar and minimize the risk of future complications. Suturing and postoperative care were designed to promote first intention healing and optimal tissue regeneration.

It is critical to recognize that adolescent patients can often experience anxiety and psychological trauma related to surgery, underscoring the importance of a comprehensive approach that includes both the physical and emotional aspects of the procedure. In addition, potential risks such as nerve injury, mandibular fractures and inflammatory processes should be carefully weighed and communicated to the patient and family.

The influence of the patient's youth on surgery extends beyond the physiological and recovery aspects. While age may be related to a reduced pain response and inflammation, it is also essential to recognize and address the psychological impact that may arise during the procedure. Practitioner skills and effective communication play a vital role in the overall perception of treatment. A comprehensive approach that considers both the medical and emotional aspects can contribute to a positive and satisfying patient experience.

CONCLUSIONS

The removal of the third molar dental germs in this case report proved to be beneficial for orthodontic treatment. This intervention provided adequate space, maintained dental stability, prevented future complications, and facilitated the dental correction process. These results support the effectiveness of third molar germ extraction as part of orthodontic treatment and highlight the importance of considering this option in similar cases in clinical practice.

Conflicts of interest

The authors declare that there are no conflicts of interest.

Authorship contribution

LEMO: original idea, conceptualization, drafting of the article, final revision, and approval of the final report.

MARF: conceptualization, drafting of the article and approval of the final report.

CHSM: conceptualization, drafting of the article and approval of the final report.

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