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CASE PRESENTATION

Impacted tooth extraction with gyroversion: Clinical case report

Extracción de diente incluido con giroversión: Reporte de caso clínico

Mónica Sofía Pallo-Sarabia[1], Joffre Josué Mullo-Allayca[1], Steven Oswaldo Paredes-Lara[1], Johanna Nicole Palacios-Soria[1]

[1]Odontología UNIANDES, Ambato-Ecuador.

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ABSTRACT

Introduction: Dental inclusion is common on upper and lower-third molars and upper canines due to some factors such as lack of space or obstructions in the eruption path. Symptoms and signs of affection can include pain, occlusion problems, and communication with the maxillary sinuses. Consequences of untreated included teeth cases might end up on an impact on bone structure, recurrent infections, tumors, and chronic pain.
Objective: To detail, through a clinical case, the surgical procedure of an included tooth.
Clinical case: A seventeen (17) year-old male patient attended to consult for orthodontic treatment, on the clinical inspection it was revealed the presence of tooth #65 and the absence of tooth #25; because of that it was required complementary examinations such as panoramic X-rays and computed tomography to have the most accurate diagnosis and a proper treatment plan. After the image examination, it was shown tooth #25 unerupted with rotation inside the maxillary bone structure.
Results: After an accurate clinical evaluation of the case using image to confirm, a surgical extraction of included tooth #25 was performed with success.
Conclusions: An on-time detection and treatment of included tooth involves a precise surgical view and following protocols to avoid future complications. The appropriate surgical technique includes infiltrative anesthesia, full Newman incision, osteotomy, and odontosection, with special attention on avoiding communication with the maxillary sinus. Image examination results are essential for a good diagnosis and proper treatment, and it is crucial for the professional to be familiar with dental eruption chronology.

Keywords: Tooth, Unerupted; Tooth Extraction; Toothache.

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RESUMEN

Introducción: la inclusión dentaria es común en terceros molares inferiores, superiores y caninos superiores debido a diversos factores como la falta de espacio u obstrucciones en el camino de erupción. Los signos incluyen dolor, problemas de oclusión y comunicaciones con los senos maxilares. Las consecuencias de no tratar un diente incluido pueden llevar a un impacto en la estructura ósea, infecciones recurrentes, tumores y dolor crónico.
Objetivo: describir mediante un caso clínico el acto quirúrgico de un diente incluido con giroversión.
Presentación de caso: paciente masculino de 17 años, que acude a consulta por tratamiento de ortodoncia, a la inspección clínica se observó la presencia del diente 65 y la ausencia del diente 25, por tanto, se solicitó exámenes complementarios como una radiografía panorámica y una tomografía para un diagnóstico y tratamiento adecuado. Al examen de imagen se observa el diente 25 no erupcionado con giroversión dentro de la estructura ósea maxilar. Se ejecutó una extracción quirúrgica exitosa del diente incluido 25, tras la evaluación clínica y de imagen. La aplicación de medidas posquirúrgicas permite una evolución favorable, no precisándose complicaciones.
Conclusiones: el abordaje adecuado de la inclusión dentaria implicó un enfoque quirúrgico preciso y el seguimiento de protocolos para evitar complicaciones futuras. La técnica quirúrgica adecuada incluyó anestesia infiltrativa, incisión completa de Newman, osteotomía y odontosección, con atención especial para evitar comunicaciones con el seno maxilar. Los exámenes de imagen fueron esenciales para el diagnóstico, tratamiento y evolución posquirúrgica.

PALABRAS CLAVES: Diente No Erupcionado; Extracción Dental; Odontalgia.

INTRODUCTION

Several theories have been proposed on the physiology of tooth eruption, the most widely accepted being that the dental alveolus regulates the bone remodeling necessary for tooth translocation through its eruptive pathway to the alveolar crest. The dental follicle also plays a role in the suprabony stage of eruption by forming the periodontal ligament. Although studies show that the lower and upper third molars, as well as the upper canines, are the teeth most commonly impacted, any tooth can be affected. This condition is most common in adolescents and young adults, with no preference for sex or skin color.[1,2,3]

Dental impaction pathology occurs when a tooth does not erupt properly and is covered by bone or gum tissue, which may be due to lack of space, obstructions, malposition, genetic factors, injuries, infections, tumors or cysts. This prevents the tooth from erupting properly. Signs and symptoms include pain in the maxillary region, dental occlusion problems, communications with the maxillary sinuses, dental misalignment, recurrent infections and formation of cysts or tumors associated with the impacted tooth in the upper jaw.[4,5]

If an impacted tooth is not removed from the upper jaw, several complications may arise, such as impaction of the bone structure, causing resorption or deformities. In addition, there is an increased risk of recurrent infections and dental abscess formation. There may also be inflammation of the soft tissues, chronic pain, and displacement of adjacent teeth, affecting dental alignment and occlusion.[6]

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Another serious consequence of an impacted tooth in the upper jaw is the formation of cysts or tumors, which requires more invasive and complicated treatments. In addition, aesthetic complications may arise, affecting facial aesthetics and the patient's confidence. Also important is the need for complex and expensive treatments, such as reconstructive surgeries and bone grafting, in severe cases.[7] Dental gyroversion, on the other hand, is the rotation of a tooth on its longitudinal axis. Causes may include lack of space in the dental arch, malposition of adjacent teeth, dental trauma, and genetic factors that affect the development and position of teeth.[8,9]

The purpose of this article is to detail, through a clinical case, the surgical procedure of an impacted tooth, due to the rarity of the occurrence, since the tooth, in addition to being impacted, was completely inverted.

CASE PRESENTATION

A 17-year-old male patient, who came to the consultation for orthodontic treatment, at the time of the clinical diagnosis the presence of tooth # 65 and the absence of tooth # 25 were observed, for which reason he was sent for a panoramic x-ray and a computed tomography.

At the beginning of the clinical exploration of the oral cavity, a restoration of tooth # 36 could be observed. In addition, a temporary tooth # 65 was found. When percussion and palpation tests were performed, no abnormalities were found.

In the radiological and tomographic analysis, the presence of tooth #25 was observed, which had a 180º rotation, being close to developing a buccosinusal communication (Figure 1).

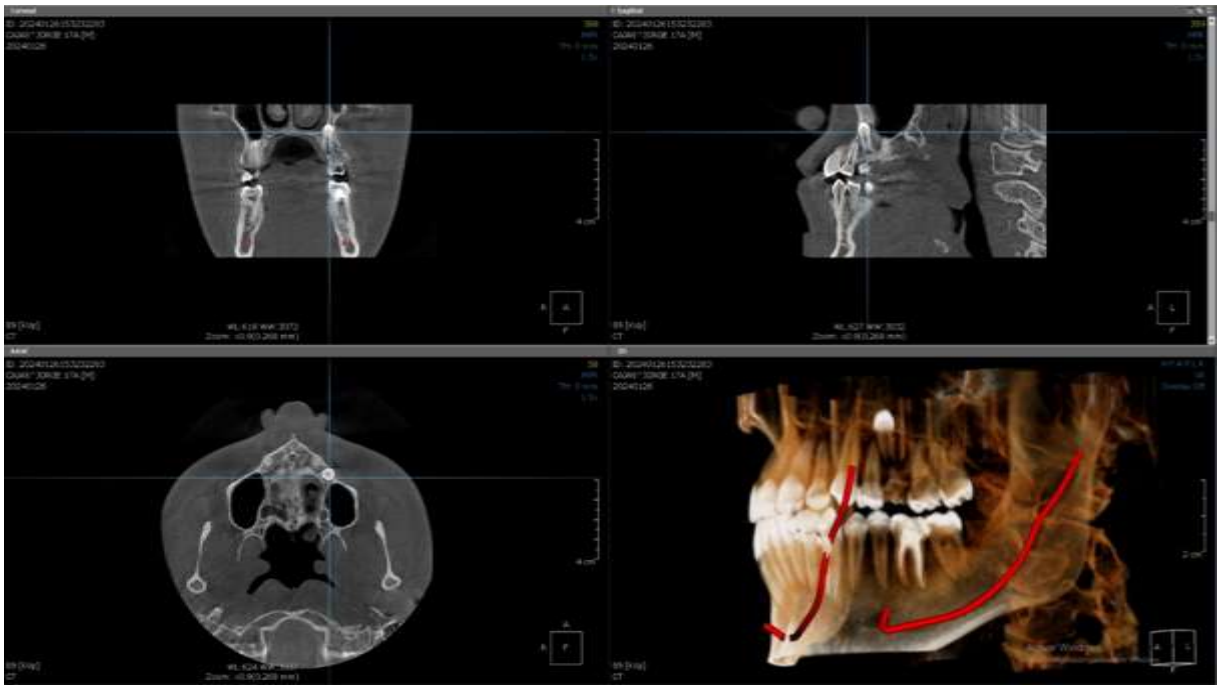

Fig. 1 Radiographic examination and computed tomography of retained upper second premolar.

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The treatment plan involved a meticulous surgical intervention. The extraction surgery was carried out using local anesthetic techniques to ensure that the patient did not feel pain during the procedure. The flap was then lifted to the level where the tooth was located, where once located, an osteotomy was performed (Figure 2) with extreme care using a micromotor, a 701 drill and abundant irrigation in the area with 0,9 % saline solution to avoid possible heating of the drill and the bone and subsequent bone necrosis. When the vestibular portion of the tooth was visualized, it was decided to perform an odontosection since due to the location and position of the tooth it was extremely complicated to extract it in a single portion. All of this was carried out with great pressure control to avoid a rupture of the small plate of bone that exists between the included tooth, the nasal sinus and the maxilla.

Fig. 2 Performing osteotomy.

Once the odontosection was performed, each fragment was extracted with an Allis forceps, since the shape of its active part allowed us to better hold the remains, achieving a successful surgical extraction of the included tooth #25 (Figure 3). To finish the surgical act, it was confirmed that no fragment of the tooth remained (for which evaluations were made using panoramic radiography and computed tomography); nor that communication with the sinus had been reached, to proceed with the lavage of the cavity using saline solution in this case, and finally the flap was repositioned to proceed with the suturing with #000 silk thread. with the use of simple stitches.

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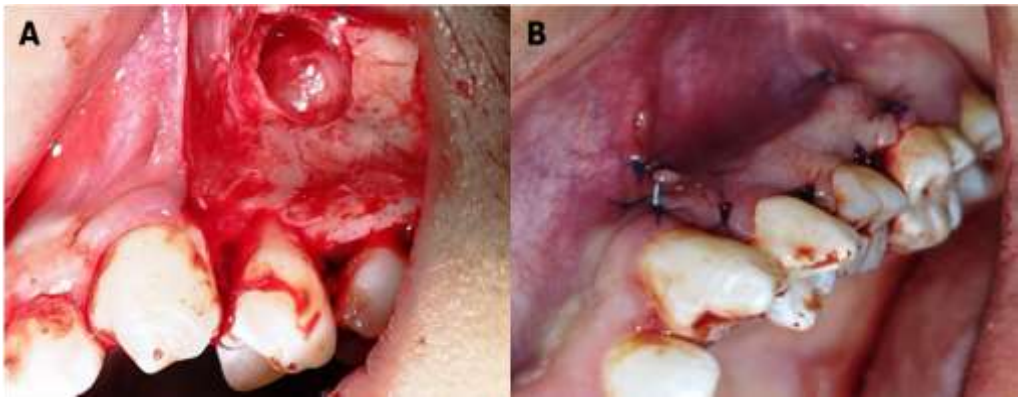
Figure 3. Extracted upper second premolar.

Following surgery, specific post-surgical care was provided to promote proper healing and minimize the risk of complications. However, the prognosis was guarded due to the complexity of the tooth's location near the maxillary sinus. This comprehensive approach ensured that all stages of treatment were handled with precision and care, considering the patient's anatomical particularities, resulting in satisfactory post-surgical results as shown in Figure 4.



Grades:(A) Cavity without the presence of tooth #25. (B) Repositioning and suturing of the flap.

Figure 4. Post-surgical results.

Post-surgical instructions included applying cold to the area for three days, not eating irritating foods, not consuming alcohol or tobacco, not spitting, or doing strenuous physical exercise for at least seven days, among others. Medication was also prescribed (amoxicillin + clavulanic acid 625 mg every eight hours for seven days and ibuprofen 600 mg every eight hours for three days).

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DISCUSSION

Dental impaction occurs most frequently in canines and third molars, however, it can occur in all maxillary and mandibular teeth, as in this case we can observe the impaction of the second upper premolar. In the present report, we worked with a young patient who did not have any personal or family pathological history, which facilitated his clinical approach with the use of local anesthetic techniques and an outpatient approach in the dental office.[2,10]

Asepsis and antisepsis were started, both in the internal part of the oral cavity with the use of dental mouthwash and gauze moistened with 2 % chlorhexidine for the external anatomical structures that surround it. Sterile eye fields were also used to isolate the surgical area in order to avoid cross contamination, in order to have a sterile and safe environment, which is extremely necessary and important for all types of oral surgery. Next, anesthetic with vasoconstrictor (2 % lidocaine) was infiltrated to have a longer working time, improve the quality of anesthesia and reduce the risk of systemic toxicity.[6] The anterior superior alveolar nerve, middle superior alveolar nerve and greater palatine nerve were blocked in order to have a greater nerve block in the surgical area and thus be able to proceed to make the incision, in which the decision was made to opt for the complete Newman type since its characteristics provide greater access and visibility, reduction of surgical trauma, better healing and a lower risk of gingival recession.[7]

Extraction of an impacted tooth with gyroversion is a complex surgical procedure that requires meticulous planning and precise execution to minimize risks and complications. This clinical case has demonstrated the importance of performing a detailed radiographic evaluation to understand the exact position of the tooth and its relationship to the surrounding anatomical structures, such as the maxillary sinus. The use of advanced surgical techniques, such as Newman incision, osteotomy, and odontosection, has allowed adequate access and safe extraction of the impacted tooth.[11,12]

One of the highlights of the case was the effective administration of local anesthesia, which ensured that the patient did not experience pain during the procedure. Correct performance of the osteotomy and odontosection was crucial to fragment the tooth and facilitate its extraction without damaging the adjacent structures. In addition, lavage of the cavity with saline solution and careful suturing of the gingival flap contributed to optimal healing and prevention of infection.[8,13]

Extraction of an impacted tooth with gyroversion presents specific challenges that require careful planning and precise execution. Comparing this case with other similar cases highlights the importance of adapting surgical techniques and postoperative care to the anatomical particularities of each patient. The preparation and experience of the surgical team are essential to minimize risks and improve outcomes. These comparisons also underline the need for an individualized and personalized approach in the management of impacted teeth to ensure the best possible outcome for the patient.[14,15]

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CONCLUSIONS

An impacted tooth is one that has formed correctly but has not erupted in its due time, becoming trapped in the bone. This may be due to lack of space, obstructions, poor positioning, genetic factors, trauma, infections, tumors or cysts. Surgical treatment includes infiltrative anesthetic techniques, Newman incision, osteotomy, odontosection, cavity lavage and suturing. Imaging examinations are crucial to determine the location of the tooth. It is important to know the chronology of tooth eruption for a good diagnosis and treatment, as well as to inform the patient about possible complications and be prepared to handle them.

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