# LeFort Osteotomy Used to Enucleate a Major Dentigerous Cyst

Osteotomía LeFort I Utilizada para Enuclear un Gran Quiste Dentígero

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**ABSTRACT**: LeFort I Osteotomy is a surgical technique frequently used for dentofacial deformities treatment. A few cases report show this technique for pathology treatment; LeFort I approach show many advantages as good visibility, good surgical control and very little postsurgical complications. In this case report, the authors present a great dentigerous cyst in premaxillae area related to supernumerary tooth. Almost three year treatment with one year of decompression, enucleation with LeFort I approach with modified sequence and one year of post operatory control showing success and predictability of technique.

KEY WORDS: LeFort I Osteotomy, dentigerous cyst, surgical treatment.

#### INTRODUCTION

Dentigerous and radicular cysts are the most prevalent cysts in the oral cavity (Mosqueda *et al.*, 2002). Generally, the dentigerous cyst is asymptomatic in the initial stages, but as it develops it can become infected, producing bone deformities and dislocation or retention of adjacent teeth. The most prevalent location of the dentigerous cyst is associated with the mandibular third molar and the region of the maxillary canines. These cysts are generally found in routine examinations such as radiographic evaluations, with unilocular radiolucent well-defined images, usually in association with tooth crowns (Neville *et al.*, 2002).

#### **CASE REPORT**

A male patient, age 24, checked into the Oral and Maxillofacial Surgery Unit of the Piracicaba Dental School, State University of Campinas, for treatment of mobility problems with his maxillary incisive teeth. The patient was found asymptomatic without signs of swelling, pain or infections (Fig. 1). A panoramic



Fig. 1. Facial and intra-oral pre-operative view showing no signs of swelling or inflammation.

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Fig. 2. Pre-operative TC-scan. Note that the lesion is related to supernumerary tooth and goes until premolars area.

radiography was taken which showed a supernumerary tooth in the root section between tooth 1.1 and tooth 2.1 and a large radiolucid area in the premaxilae region. The initial differential diagnosis was a dentigerous cyst, keratocyst and ameloblastoma. Axial and coronal computerized tomography scans were completed, revealing the extent of a lesion in the premaxilae region, which was associated with a supernumerary tooth on the palatal structure (Fig. 2). An aspiration was performed with local anesthesia (Lidocaine 2% with epinephrine 1:100.000) to access the content of the cavity. After that, a palatal approach with intrasulcular incision and a mucoperiosteal flap was made to remove the supernumerary tooth and part of the cyst tissue. A silicone drain was installed on the vestibular oral mucosa (vestibular approach),



Fig. 3. A. Vestibular approach for drain install after supernumerary tooth removal using palatal approach. B. Five moth postoperative access to the soft tissue maintained, allowing the patient to irrigate the cavity daily.



Fig. 4. A. Histopathological image from incisional biopsy showing collagen tissue and low epithelium layer. B. Histopathological image from excisional biopsy showing major epithelium layer and inflammatory infiltrate due to decompression time.



Fig. 5. Biomodel showing the lesion in the premaxillae region compromising the nasal floor and right maxillary sinus.

above the roots of teeth 1.1 and 2.1 (Fig. 3A). The histopathological result was dentigerous cyst (Fig. 4A).

The drain was used to irrigate the cavity with clorexidine 0.12% until the 10th day after surgery, when the drain was accidentally removed by the patient. But access to the soft tissue was maintained using a fistula, allowing the patient to irrigate the cavity daily in order to keep it clean and free from infections (Fig. 3B). On dental assessment, only tooth 12 presented pulpar necrosis, requiring endodontic treatment. The decompression and irrigation was continued for 12



Fig. 6. LeFort I Osteotomy with internal rigid fixation. Note the continuity of apertura pririformis (white arrows), guaranteeing the same preoperative 3D position of the maxillae.

months. At that time a new CT-Scan was performed, with a biomodel for planning the cyst enucleation surgery (Fig. 5).

The surgical decision was enucleation with LeFort I Osteotomy approach under general anesthesia. After the mucoperiosteal flap was made, internally rigid fixation plates with four screws were installed (2.0 system). After the plates were removed, a LeFort I osteotomy was performed, and the cyst was removed with curettage, allowing the complete removal of the cyst. At the end of the surgery the maxilla was put back into place where the plates had previously been placed (Fig. 6).



Fig. 7. One year postoperative panoramic demonstrating bone regeneration in premaxillae.

Histopathological analyses showed a soft tissue with cyst characteristics, with fragments of respiratory epithelium, probably because of the one year decompression time (Fig. 4B). One year after surgery, the patient showed no aesthetic, functional or sensitivity complications, demonstrating the effectiveness of the surgical procedure and new bone formation (Figs. 7 & 8).



Fig. 8. One year postoperative intr-oral view. Occlusion stability and lack of swelling.

### DISCUSSION

Scolozzi et al. (2005) showed that there were only nine research studies that reported an association between mesiodens and dentigerous cysts, and only two of those nine patients were treated with marsupialization. The remaining seven patients showed some symptoms, mainly inflammation. In all nine cases the cysts were discovered when the patients were in their twenties. If Scolozzi is right, our case is only the tenth report with this "mixture" situation. In these nine cases with this mixture characteristic, the supernumerary tooth was removed with the cyst enucleation (Sxolozzi et al.; Kozelj & Sotosek, 1999), but in major cysts, such as in our research, the decompression helps to decrease the cystic volume and stimulates the adjacent osseous reparation. For this reason, a therapy with decompression and posterior enucleation is recommended for these cases (Carlson, 2004).

In an evaluation of keratocysts, the decompression was continued for 6 to 12 months using direct irrigation with clorexdine 0.12%, with a decreasing cystic volume close to 65%. At the end of marsupialization, the cyst enucleation was performed, resulting in structural alteration of the cystic epithelium in 64% of the patients. All treatment times were nine months or more (August *et al.*, 2003). These findings of the decrease in volume are confirmed by the protein expression, which decreased on the cystic walls (Ninomiya *et al.*, 2002).

In this case, the histology analysis after 12 months of decompression time showed absence of the cyst epithelium, with amorphous structure, with just traces of the respiratory epithelium due to the osseous fenestration in the lower part of the nasal cavity and the union of the nasal mucosa with the cystic capsulate.

Following the cyst enucleation, it is not necessary to fill the cavity with any material, since the osseous neoformation quantity and quality is almost 90% after 3 years and close to 50% of cavity volume is recovered one year after surgery (Chiapasco et al., 2000). Despite that, some authors propose inserting biomaterials or osseous graft into the cavity (Bodner, 1996). The authors of this case report believe that these materials can possibly become infected and compromise dental structures close to the location of the cyst cavity.

From the surgical approach of Cheever in 1867 with Lefort I Osteotomy and the surgical technique of Partsch in 1898 for the surgical removal of a tumor with the same surgical approach, Lefort I Osteotomy is a routine procedure for the correction of dental-facial abnormalities, but it is not for removal of some pathologies located at the medial third (Drommer, 1986).

However, a series of nine case studies published for Eisig *et al.*(2000) and 19 cases published by Mello-

Filho *et al.* (2004), confirmed the practicality and predictability of the technique. In addition to aesthetic conservation and safety, another advantage is better visibility for the surgeon during the surgery when working with the medial third of the face, even for procedures such as maxilectomia for neoplasias. For patients with malignant tumors this approach is better than others (Kademani, 2007; Keller, 1988).

This access allows a primary closing of the wound, providing more comfort to patients (Chima, 2006). The Lefort I Osteotomy procedure allows a minor ostectomy, decreasing the possibility of creating new

osseous defects or oroantral communications because of the lack of osseous tissue support beyond the soft tissue (Scolozzi *et al.*, 2007). The authors believe that his approach also reduces the chances of recurrence of the lesion, because the zone is more visible making it easier to remove the cyst capsule withoutfragmenting it (William *et al.*, 2000).

In this case, the Lefort I Osteotomy approach makes it easier to recognize the lesion, with good visibility for the surgeon and excellent final aesthetics for the patient, being more conservative because it removes less bone than others approaches.

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**RESUMEN**: La osteotomía LeFort I es una técnica quirúrgica frecuentemente utilizada para el tratamiento de deformidades dentofaciales. Pocos casos han mostrado su uso para el tratamiento de patologías; el acceso con osteomotias LeFort I muestra muchas ventajas como la buena visibilidad, buen control de la cirugía y pocas complicaciones postquirúrgicas. En este reporte de caso, los autores presentan un quiste dentígero de grandes proporciones en el área de la premaxila asociada a un diente supranumerario. Casi tres años de tratamiento con un año de descompresión, enucleación con acceso de LeFort I con una secuencia modificada y un año de control postquirúrgico muestran éxito y predictibilidad de la técnica.

PALABRAS CLAVE: osteotomía LeFort I, quiste dentígero, tratamiento quirúrgico.

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