

The Use of Oral Maxillofacial Prosthesis in Post-Maxillectomy Rehabilitation: A Case Report

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Abstract

Background: The presence of benign or malignant bone lesions in the maxillofacial region of children, requiring radical surgical treatment, represents a complex clinical challenge. Surgical removal of the lesion can lead to maxillo-mandibular and facial growth disabilities, compromising the masticatory, respiratory and swallowing functions. The remaining oro-facial defect is responsible to some aesthetic, psychological, and emotional problems.

Case report: The clinical case describes a 9 years-old male with an aggressive fibro-osseous tumor involving a large part of the maxilla, resulting in significant morpho-functional and aesthetic sequelae. The tumor was surgically removed. The oral rehabilitation was performed with the immediate and mediate use of an oro-maxillo-facial obturator prosthesis, as well as a conventional dental care. **Conclusion:** A multi-disciplinary team is necessary to provide support during the treatment and to rehabilitate the functions that had been lost post-maxillectomy.

Key Words: Oral neoplasms, Oral rehabilitation, Child

Introduction

Partial maxillectomy is a radical surgical technique recommended for the treatment of large benign lesions, or malignant lesions requiring an extensive safety margin, in their treatment [1]. The surgery can lead to major difficulties in the reconstruction and the rehabilitation [2,3]. Maxillectomies generally determine oro-antral communication, in a greater or lesser degree, depending on the extension of the removed area. The size of the communication is related to the risk of malnutrition and weight loss. The negative psychological impact on patient's behavior is another issue that we cannot forget [3].

Obturator prostheses are used to efface openings and holes in the palate, which are related to the presence of a communication between the oral cavity and the nasal or sinusal cavity. These defects can be either congenital or acquired. The use of obturator prosthesis is indicated for both dentate mouths and for partially or totally edentulous mouths. The aim of the prosthesis is to re-establish masticatory, phono-articulatory and aesthetic function in patients who undergo resection of the hard palate and maxilla. Prostheses are generally made with thermo-polymerizable acrylic, and may include artificial teeth [4].

Oral-nasal and oro-antral communications arising from the surgical resection of tumors in the mouth are important issues that are included in the field of action of the dentistry. Several problems can arise from direct communication between the oral cavity and the nasal or sinusal cavity. These difficulties are related to the speech, swallowing, ingestion of liquids, solids and chewing, all of them due to the loss of teeth or bone tissue during surgery [5-8]. These structural and facial alterations can affect the patients psychologically, influencing their quality of life [8].

Care of these patients requires a multi-disciplinary approach to help them on their aesthetic and functional adaptation [7-9]

reestablishing their quality of life. When available, the planning of the rehabilitation should be performed before surgery, requiring the partnership of a dental surgeon and a head and neck surgeon. The pre-operative study of the radiological images of the lesion that will be removed is the first step to the success of the rehabilitation. The installation of an immediate obturator during the surgical/hospital inpatient period will help to protect against injuries. This temporary obturator will re-establish the oral feeding and the speech, making unnecessary use of naso-gastric tubes. Additionally, the patient's satisfaction is improved. In children, the concern to offer an appropriate follow-up, foreseeing the oral maxillofacial growth, should be considered.

The aim of this case report is to describe the clinical case of a pediatric patient who had his right maxilla surgically removed due to a benign neoplasm with an aggressive behavior, and to evaluate the patient's immediate and mediate post-operative rehabilitation.

Case Report

A 9-years-old male underwent surgical removal of a large and fast growing Juvenile Ossifying Fibroma with an aggressive behavior. The tumor included the entire right maxilla, distorting the morphology of the nasal wall on the same side, with a posterior extension (*Figures 1A, B, C and D*). The surgical procedure consisted of a total right side maxillectomy, under general anesthesia. The facial approach was performed using a paralateronasal incision on the right side of the face (*Figure 1E*). The tumor was resected with appropriated surgical margins. The infra-, meso-, and superstructure portions of the right maxilla were included in the resection, that extended to the anterior portion of the right zygomatic bone, and the left side of the hard palate, crossing over the midline plane. The specimen was removed in monobloc, and the surgical limits exceeded the limits of the tumor (*Figure 1E*). The floor of the eye socket was reconstructed using a net

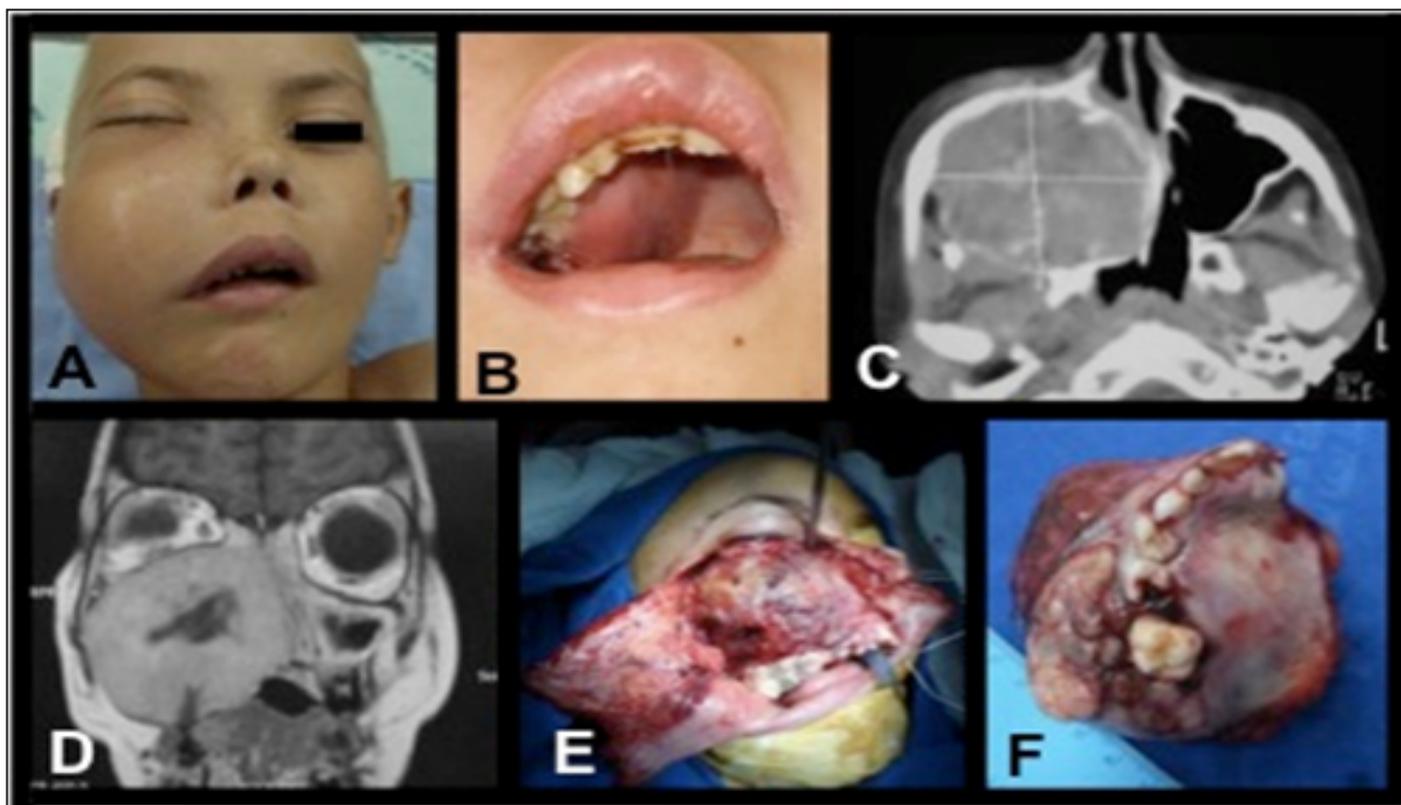


Figure 1. Pre and trans operative images of the patient. A: The face of the patient showing increased volume on the right side of the face, with displacement of the eyeball. B: Intra-oral volume increased in the right maxillary. C and D: Computerized Tomography and Magnetic Resonance showing the large size of the tumor. E: Trans-operative. F: Surgical specimen removed.

of wires anchored between the ethmoid bone and the right zygomatic bone, keeping the contents of the eye socket intact. The peri-orbita structure was preserved, and right eye position was kept at the same level of the left eye plane. The soft tissue of the remaining facial flap of the right maxillary region was covered with a partial skin graft. The surgical defect was filled with an occlusive dressing, which was held in position for seven days.

The patient was fed orally the day after the surgery. Before the tumor resection, a maxillary alginate impression (Jeltrate, Dentsply, Milford, EUA) was done to obtain a preliminary cast and a temporary ethylene/vinyl acetate (Whiteness, FGM, Joinville, Brazil) obturator was made and installed, with the objective to facilitate an early oral feeding following the definitive removal of the tumor. Few days after the first reconstruction, a new temporary obturator was taken in place, which fit better for the remaining defect (*Figure 2A*). This new obturator was relined with heat-activated acrylic resin (VIPI Wave, São Paulo, Brazil) without teeth, keeping the same size of the surgical space and filling the whole surgical defect (*Figure 2B*).

One month later an obturator prosthesis with artificial teeth (permanent maxillary left central incisor, permanent maxillary right central incisor, permanent maxillary right lateral incisor, primary maxillary right canine, primary maxillary right first molar, primary maxillary right second molar, permanent maxillary right first molar) was made from heat-activated acrylic resin (VIPI Wave, São Paulo, Brazil) and with circumferential staples on the primary canine and second molar on the left side. The prosthesis retention was improved with the insertion of stops on the resin of the canine and second molar. The mucosa of the defect had healed

partially, and some granulation tissue and sinus secretion were observed. The patient developed right hemifacial sinking due to bone loss (*Figure 3*).

During the six months follow-up, the patient was assisted at the Dentistry Department (Department of Pediatric Dentistry/UFSC/Brazil) for treatment of carious lesions and complimentary adjustments of the obturator prosthesis.

In an appropriate odontological environment for the performance of the remaining dental procedures, the absence of elements permanent maxillary left central incisor, permanent maxillary right central incisor, permanent maxillary right lateral incisor, primary maxillary right canine, primary maxillary right first molar, primary maxillary right second molar, permanent maxillary right first molar was noted. Extensive caries involving elements primary mandibular left first molar, primary mandibular right first molar, primary mandibular right second molar and permanent maxillary left lateral incisor were restored with resin and the remaining root of element primary mandibular left second molar was extracted and put a space maintainer.

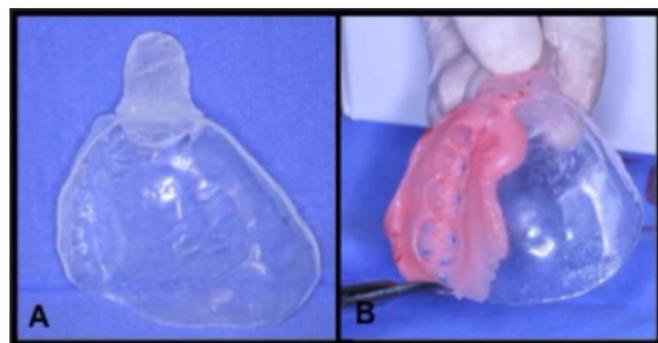


Figure 2. A: Temporary obturator B: Obturator relined with heat-activated acrylic resin.

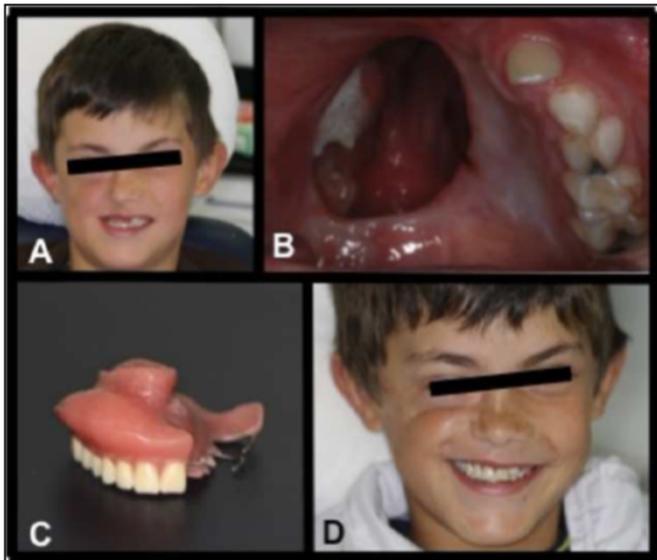


Figure 3. Images of the patient approximately one years after surgery. A: Face of patient displaying subsidence on the right side, with downward displacement of the eyeball. B: Oral-nasal and oro-antral communication. C: Acrylic prosthesis with orthodontic staples for improved retention. E: Patient with prosthesis installed.

The patient's treatment is going on in a continuous way. Preventive actions have been done, including improvement in oral care, and the use of topical fluoride. As the patient grows, rebasing of the obturator prosthesis is carried out. The patient was included in a speech pathologist care program and is being followed-up by a psychologist. The final reconstructive surgery with a microvascular free flap is planned for a soon time.

Discussion

In the case described in the present study, the patient suffered from a Juvenile Ossifying Fibroma, a benign fibro-osseous lesion, of non-odontogenic origin, which displays aggressive localized behavior [10] and relatively rapid evolution in young children, so requiring a radical surgical approach [11]. When affecting the maxillofacial region, the necessity of a radical surgical approach in younger patients presents additional sequelae. It is known that an imbalance on one side of the face can affect facial symmetry in adulthood.

In addition to oro-antral communication the patient displayed subsidence on the right side of the face, leading to significant functional and aesthetic problems. The reconstruction and rehabilitation of the maxillectomized patient can be performed using surgical techniques involving the rotation of flaps and microvascularized flaps, and the use of prosthesis with a palatal obturator [2].

In the case of pediatric patients, these operations have to be performed always respecting the growth and development rate of the patient's face. The use of temporary obturator prosthesis, waiting for the completely healing of the tissues and the recovering of lost teeth, is an important step before the definitive reconstruction using microvascular free flaps. According to Turkaslan et al. [9], the main objective of the protective obturator is to close the opening caused by the

maxillectomy, separating the oral cavity from the sino-nasal cavity. In the clinical case described, the temporary prosthesis was mucous-supported and to minimize the weight of the apparatus, it contained only the anterior teeth.

The negative psychological impact of tooth loss may have downstream repercussions on the growth and the developmental process in children. This consideration leads the patient to be referred for psychological counseling earlier.

The rehabilitation of patients with facial defects using maxillary obturator prosthesis has played an important role in improvement of the quality of life for such patients [8]. Some studies have investigated the quality of life of patients who underwent a maxillectomy and used obturator prosthesis. Depprich et al. [8] evaluated the quality of life of 43 patients who used an obturator prosthesis following a maxillectomy. The patients filled out a questionnaire and were submitted to an interview. The authors concluded that the use of obturator prosthesis was important in the rehabilitation of post-maxillectomy patients and that the quality of life of patients using such prosthesis was satisfactory, especially if added to a psychological treatment and a speech therapy. This study helped us to decide for the use of a comprehensive and multidisciplinary approach described here in our case report.

Kornblith et al. [5] found that patients had some benefits when they were informed about the surgical procedure and subsequent use of an obturator prosthesis. Several patients interviewed in the study believed that the access to relevant information before and after the surgery would help them to reduce and prevent a possible psychological trauma.

The current clinical study, showed that Pediatric Dentistry can play an important role in this multidisciplinary team approach, performing specific procedures immediately before and after surgery and by providing support for other complementary medium and long term procedures. Additionally, actions focusing on the improvement of the oral health, the elimination of septic foci, and the care of the remaining teeth will serve as a support for a future rehabilitation. This follow-up requires a medium and long term dental care. A multidisciplinary approach including Dentistry, Oral and Maxillofacial Surgery, Speech Therapy, Psychology and areas of medicine such as Head and Neck Surgery, Plastic Surgery, and Pediatrics, is important for the whole recovering of the quality of life of the patient.

Conclusion

The immediate and mediate use of an obturator prosthesis in cases of oral sino-nasal post-surgical defect in children is extremely important for the recovering of chewing, speech, respiratory and aesthetic functions, affected by the loss of large amounts of oro-facial structures and, consequently, to lead to an improvement in the quality of life of these patients.

Acknowledgments

Thanks to psychologist Rosamaria Areal and speech therapist Helena Blasi.

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