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## ANATOMICAL JAW RESTORATION OF A CHILD WITH PLEUMORPHIC ADENOMA IN THE MAXILLA

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**Abstract:** Introduction: Literature review findings indicate a continuous increase in the frequency of tumors in the maxillo-facial area. An increase in the cases of malignant and benign tumors is reported with pleomorphic adenoma being the most common. A retrospective study for the 1942-2012 period shows that pleomorphic adenoma occurs in 44% of the cases of benign tumors in the oral cavity. Research results suggest that pleomorphic adenoma and malignant cancers of salivary glands tend to more frequently affect children and young people below the age of 18.

Aim: The purpose of the article is to analyse the opportunities for conducting an anatomical jaw restoration of a child with pleomorphic adenoma of the upper jaw after resection and covering of the defect with muco-periosteal flap without bone base.

Materials and methods: The study explores the prosthetics process of a 12-year-old girl with resection of a half of the upper jaw after which the border between oral and nasal cavities is composed of soft tissue only. As a consequence of the resection, 2/3 from the jaw and teeth from 21 to 17 were removed. The prosthetic recovery was extremely difficult because of the absence of a stable bone foundation and patient's age. The development of a partial denture was required, as well as using the opposite vestibular bone surface for its retention. The impressions of the both jaws were taken with alginate. The denture was created with heat cured acrylic resin after fixing the occlusion height, centric relations and a successful trial denture.

Results: Prosthetics results showed a good retention and stability of the denture due to the inclusion of the complete vestibular surface of the preserved bone left side. It facilitated a successful restoration of feeding and speaking functions, despite the lack of a stable bone structure. The check-ups results demonstrated a smooth adaptation to the denture and an absence of decubitus ulcers.

Conclusion: Prosthetic restoration of the oral cavity after a surgical intervention of oncological diseases is related to numerous difficulties and problems, especially among children. The process requires the development of modified dentures which comply with the age and specific circumstances of each clinical case. The number and localisation of preserved teeth, as well as the applied surgical technique for tumor removal have an important role for the success of the anatomical restoration of the jaw.

**Keywords:** denture, maxillary resection, maxillary defect, obturator, pleomorphic adenoma.

### 1. INTRODUCTION

Literature review findings indicate a continuous increase in the frequency of tumors in the maxillo-facial area (Cohen, N. et al., 2018). An increase in the cases of malignant and benign tumors is reported with pleomorphic adenoma being the most common (Lin, C. et al., 2010). A retrospective study for the 1942-2012 period shows that pleomorphic adenoma occurs in 44% of the cases of benign tumors in the oral cavity (Abrahão, A. et al., 2016). Research results suggest that pleomorphic adenoma and malignant cancers of salivary glands tend to more frequently affect children and young people below the age of 18 (Carlson, E. et Schlieve, T., 2019).

Prosthetic recovery of the oral cavity is a main method for restoration of damaged functions after a surgical removal of tumors (Rolski, D. et al., 2016). This requires a very precise planning and design of denture type. According to most authors, denture development has to take into consideration the main prosthetic principles, individual characteristics and patient's age (Kay, S. et al., 2015). In particular, it is essential to address the factors, which are likely to affect denture's retention and stability, as they have a decisive role for improving feeding, speaking and aesthetics (Singh, M. et al., 2020).

Most empirical findings suggest that the restoration of damaged functions depends on the size and localisation of a defect, as well as the presence of teeth (Dalkiz, M. et Dalkiz, A. S., 2018; López-Jornet, P. et al., 2012). The type of denture and used materials also play an important role in the recovery process (Shambharkar, V. I. et al., 2011; Kamarudin, K. H. et al., 2018). Most scholars argue that the application of acrylic resin facilitates the achievement of enhanced stability and relatively good retention of the obturator; thereby, improving speaking and feeding functions (Ali, R. et al., 2015).

Anatomical recovery opportunities of patients with maxillary defects include surgical restoration or obturating denture; however, there are contradictory findings regarding the advantages and drawbacks of these methods. A systematic review of publications in Medline, PubMed and Web of Science between 2005 and 2015 indicates a lack

of significant difference in life quality regardless of the applied prosthetics method (Brandão, T. B. et al., 2016). Research findings demonstrate that patients with obturators have life quality which is comparable or even better than people with other chronic diseases and very close to the one experienced by healthy people. Others argue that prosthetic rehabilitation provides a quicker and easy recovery of damaged functions, especially in cases with large defects (Sahoo, N. K. et al., 2016). Studies among patients with prosthetic restorations indicate confirmative outcomes suggesting a successful recovery of speaking and normal articulation (Matiakin, E. G. et al., 2009).

## 2. MATERIALS AND METHODS

The presented clinical case explores the prosthetic process of a 12-year-old female patient who had a surgical intervention because of pleomorphic adenoma of upper jaw. An examination revealed the removal of 2/3 of the maxilla and the teeth from 21 to 17 (Fig. 1). As a consequence of the resection, the border between oral and nasal cavities is composed of soft tissue only. Due to absence of a stable bone foundation, the mucosa in the defect area was flexible and pliable which made the prosthetics process very difficult. The recovery plan required the development of a partial denture by using the opposite vestibular bone surface for its retention. Natural preserved teeth were used for denture fixation and stability. Impressions of both jaws were taken with alginate. Registration of occlusion height and centric relations were performed with wax rims. After a successful trial denture, the construction was finished by heat cured acrylic resin. In addition, a lingual bar was integrated in the area of tooth 27 in order to protect from fracture (Fig. 2, 3). The denture was carefully adjusted in the final stage; thereby, contributing to a smooth and non-traumatic insertion.



*Fig. 1. Intraoral patient's view*



*Fig. 2. Completed denture-occlusal view*



*Fig 3. Completed denture-palatal view*



*Fig. 4. Adjusted denture*

## 3. RESULTS

Prosthetics results showed a good retention and stability of the denture due to the inclusion of the complete vestibular surface of the preserved bone left side (Fig. 4). It facilitated a successful restoration of feeding and speaking functions, despite the lack of a stable bone structure. The use of natural teeth's retention zones facilitated

the dense denture fixation to the mucosa. The achieved improvements in retention and stability facilitated speaking functions. The minimal thickness of prosthesis plate and its thinning in the soft palate border also contributed to the recovery process. Aesthetics was also effectively restored with positive effects on the child's desire to attend school and have social contacts. The check-ups results demonstrated a smooth adaptation to the denture and an absence of decubitus ulcers.

#### 4. DISCUSSION

They are different operating methods for an anatomical recovery of jaws among kids with maxilla tumors. In most instances, resection causes defects between oral and nasal cavities with adverse impact on feeding, speaking and swallowing functions. This requires the creation of obturators which constitute frequently applied and specific prosthetic devices for restoration. In this particular case, covering the defect with muco-periosteal flap without bone base complicated the prosthetic recovery. Additional difficulties originated from the patient's age which required the fabrication of modified partial denture. The achieved positive results confirmed the idea that prosthetics methods had to be based on individual characteristics and age (Kay, S. et al., 2015).

The absence of stable bone foundation and mobile sensitive mucosa inhibited prosthetic rehabilitation. The use of the preserved teeth was the only option for providing good retention and stability. It facilitated the successful restoration of feeding and speaking; thereby, confirming the role of natural teeth in normalisation of damaged functions, as suggested by previous studies (Dalkiz, M. et Dalkiz, A. S., 2018; López-Jornet, P. et al., 2012).

The application of acrylic resin provided a stable base and denture strength which had been reported by other authors, as well (Ali, R. et al., 2015). A lingual bar was used in the area of 27 in order to provide better mechanical resistance and protection from fractures. The achieved retention contributed to improvements in speaking and aesthetics. This confirms the idea that prosthetic methods continue to be of key importance for recovery after a maxillary resection (Rolski, D. et al., 2016). Regardless of the patient's age, smooth adaptation and a significant improvement in life quality were achieved similarly to observations among adults (Sahoo, N. K. et al., 2016).

#### 5. CONCLUSION

Prosthetic restoration of the oral cavity after a surgical intervention of oncological diseases is related to numerous difficulties and problems, especially among children. The process requires the development of modified dentures which comply with the age and specific circumstances of each clinical case. The number and localisation of preserved teeth, as well as the applied surgical technique for tumor removal have an important role for the success of the anatomical restoration of the jaw.

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