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## Algorithms of medical tactics in providing orthopedic care to patients with congenital clefts of upper lip and palate in adulthood

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### ABSTRACT

The total number of 41 patients with different types of congenital clefts of upper lip and palate were examined. With the aim of finding out morphological and functional features of anomalies of the dento-maxillary system the diagnostic models of jaws were investigated. The completed research allowed carrying out typification of deformations of maxillofacial complex in adult patients with congenital cleft of the upper lip and palate after plastic surgery from the standpoint of a prosthetic dentist. Algorithms of clinical decision-making relating to the choice of the proper orthopaedic construction of prosthetic rehabilitation appliance were developed. The worked up algorithms were grounded on the principles of division (severity, significance) of maxillofacial system deformations, distorted on sagittally, transversally and vertically by inborn defects. Prosthetic treatment of such patients is possible by one of the 3 following principles. Theoretical and practical recommendations of prosthetic treatment application in adult patients with the choice of the appropriate orthopaedic constructions were proposed.

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## 1. Introduction

Congenital malformations of maxillofacial area in Ukraine makes up 30-45% of the total number of defects (Prykhodko 2007; Shakirova, Pogudina 2011), out of 800-1000 children one child is born with cleft upper lip, palate or a combination of these two defects, and for last 50 years the birth of children with cleft upper lip and palate has increased twice (Ivanov et al. 2008). The primary method of treatment remains the early surgical closure of congenital cleft of upper lip as well as the palate.

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However, these early operations can not affect the further development of the upper jaw, which can lead to the development or strengthening maxillofacial deformations at the absence of appropriate skilled care (Makyeyev et al. 2011).

## **2. Material and methods**

41 patients, including those with unilateral cleft – 28 patients, with bilateral – 12 patients, and 1 patient with incomplete partial cleft palate, have undergone the primary survey and prosthetic treatment. Previously, patients were treated in the department of maxillofacial surgery of Lviv Regional Hospital. At the moment of the study of providing them necessary orthopedic care the patients reached the age of 16-20 years, when such assistance can be provided to them, and it is the time of forming the maxillofacial complex.

## **3. Results**

The completed research allowed carrying out typification of deformations of maxillofacial complex in adult patients with congenital cleft of the upper lip and palate after plastic surgery from the standpoint of a prosthetic dentist. The main features of these deformations are: 1) underdevelopment of the upper jaw by sagittal that often leads to pathologies such as “false progeny”; 2) narrowing of the dental row of the upper jaw, more expressed on the side of the cleft; 3) underdevelopment of small fragment of cleft maxilla for sagittal; 4) location of the lateral teeth of small fragment of cleft maxilla in supraocclusion; 5) defects of dental rows and alveolar bone at the site of cleft and dental row defects due to a tooth loss. These types of deformations of maxillofacial complex can be expressed to a lesser or greater extent, dictating prosthetic dentists different approaches to providing orthopedic care and, therefore, the choice of the orthopedic construction. Based on the conducted researches and our experience in providing orthopedic care to such patients, we have developed algorithms for medical decision-making for choosing appropriate orthopedic construction prosthetic rehabilitation.

Algorithm 1 of medical tactics (Fig. 1) includes patients without sharply expressed deformations, but who may have defect of a dental row and an alveolar bone at the site of cleft. In the first case, an orthopedic correction can be performed by planimetric restoration and forming frontal and / or lateral sections of a dental row of the upper jaw with composite overlays. In the second case, at the presence of dental row defect, aesthetic and functional rehabilitation is possible only by using non-removable prosthetic appliances if necessary with artificial gums.

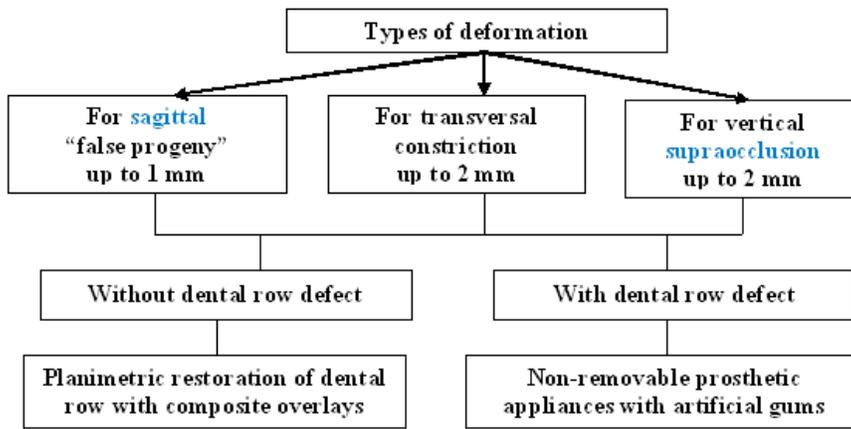


Fig. 1. Algorithm 1 medical decision-making with the choice of orthopedic construction in patients with type I deformations

Algorithm 2 of medical tactics (Fig. 2) refers to patients with more expressed deformations of maxillo dental system and by all parameters they equal 2-4 mm. Providing such patients with orthopedic care is only possible with the use of non-removable constructions with planimetric aesthetic modeling of artificial teeth and artificial gum. It should be noted that patients with this type of deformation without defects of a dental row and an alveolar bone are extremely rare.

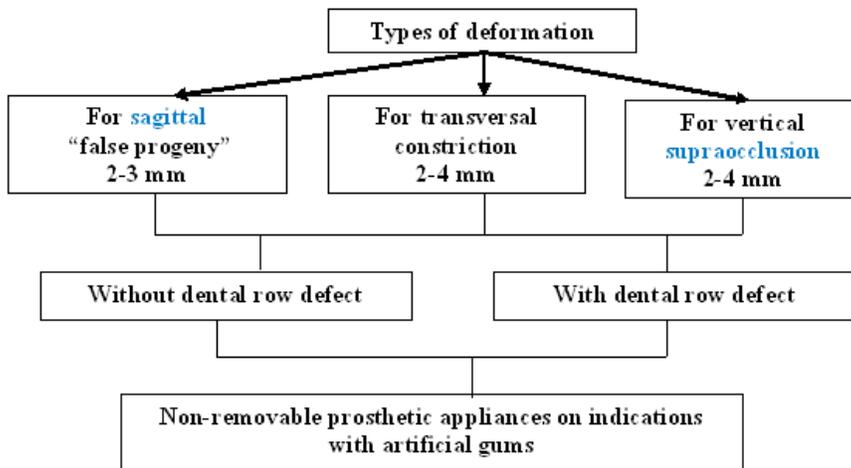


Fig. 2. Algorithm 2 medical decision-making with the choice of orthopedic construction in patients with type II deformations

Algorithm 3 of medical tactics (Fig. 3) refers to patients with significant deformities of maxillo dental complex which by various parameters exceeds 4 mm or more. Substantial defects of dental rows and alveolar process are detected in such patients, including the lack of mid-jaw bone. Orthopedic care to such patients

is based on the manufacture of removable covering dentures with double dental row, planimetric restoration of alveolar process using different systems of dentures fixation (locks, beam, telescopic crowns, etc.).

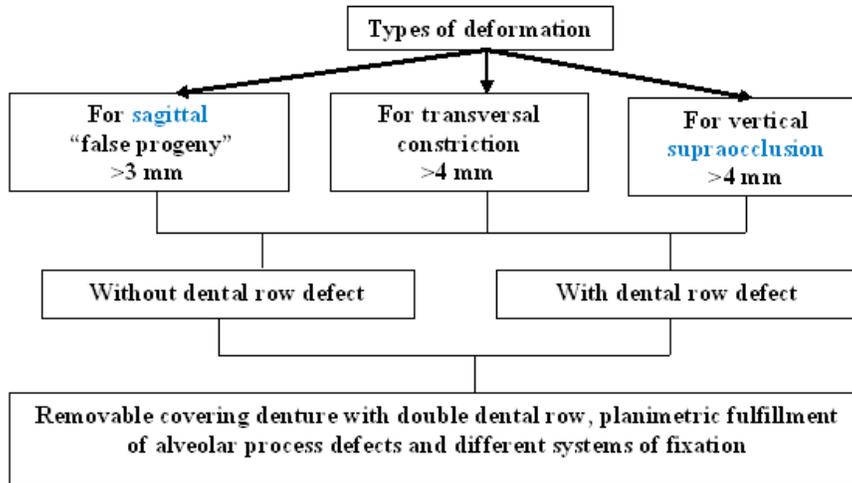


Fig. 3. Algorithm 3 medical decision-making with the choice of orthopedic construction in patients with type III deformations

#### 4. Discussion

Narrowing and shortening of a dental row of the upper jaw are the most characteristic anomalies of maxillofacial system after surgical treatment of through cleft of upper lip and palate. They are leading to the formation of false progeny and cross bite and they are accompanied by various anomalies of a dental row (Sykut et al. 2004). Combined expressed deformation of occlusion in different planes develops at the absence of proper orthodontic treatment which accompanies by jaw anomalies deformations and defects of dental rows (Strong 2002). Treatment of maxillofacial anomalies has special features in adults, which are caused by several factors: not all types of anomalies of maxillofacial system in adults are treatable because over the age of 18-20 years to affect the jaw bone rather predictably is no longer possible; and over 40 years periodontal diseases and progressive loss of teeth restrict further growth of the upper age limit of orthodontic treatment. Patients prosthetics is conducted at the final stage of all other rehabilitation measures and it consists of a dental row and alveolar process defect replacement, complete occlusion creating, function and aesthetics restoration (Strong 2002; Trezubov et al. 2003). The choice of orthopedic construction depends on previous orthodontic treatment results, quality and quantity of remaining teeth, sagittal and vertical incisive overlap degree, alveolar process hypoplasia in the cleft area, dental rows deformities, soft tissue scars and strands location concerning the remaining teeth, existence or absence of mid-jaw bone (Goiato et al. 2010).

So, our worked-out orthopedic care providing algorithms are based on the distribution (severity, intensity)

principle of deformations of maxillofacial system, distorted in sagittal, transversal and vertical because of birth defects.

## 5. Conclusions

Prosthetic treatment of such patients is possible by one of the 3 following principles: 1) orthopedic correction can be performed by planimetric restoration and forming frontal and/or lateral sections of a dental row of the upper jaw with composite overlays or if dental row defect exists, aesthetic and functional rehabilitation is possible only by non-removable prosthetic appliances, with artificial gums on indications; 2) by using non-removable constructions with planimetric aesthetic artificial teeth and artificial gum modeling; 3) by manufacturing removable covering dentures with double dental row, planimetric alveolar process restoration using different systems of denture fixation (locks, beam, telescopic crowns and hybrid dentures, fixed on implants).

## References

1. Goiato MC, Santos DM, Villa LM (2010). Obturator for rehabilitation of cleft palate with implant-supported retention system. *J. Craniofac. Surg.* 21(1):151–154.
2. Ivanov AL, Korolenkova MV, Vorob'ev RO (2008). Algorithm of children cleft lip and palate treatment standardization with use of the computer methods of data record. *Stomatologia* 1:77–78.
3. Makyeyev VF, Oliynyk GV, Oliynyk AY (2011). Analysis of surgical interventions in patients with congenital cleft upper lip and palate *Ukrainian dental Almanac* 3:30–33
4. Prykhodko TA (2007). Congenital cleft lip and/or palate: prevalence among newborns and risk factors of origin. Thesis abstract for candidate of science degree competition in genetics. Kharkiv, 14 p.
5. Shakirova RR, Pogudina LV (2011). Pathology occlusion in children with developmental disabilities maxillofacial. *Orthodontia* 1:9-11.
6. Strong SM (2002). Adolescent dentistry: multidisciplinary treatment for the cleft lip/palate patient. *Pract. Proced. Aesthet. Dent* 14(4):333–338.
7. Sykut J, Mieszkowski P, Bakalczuk M et al. (2004). Prosthetic rehabilitation of edentulous patients with cleft palate. *Ann. Univ. Mariae Curie Sklodowska Med* 59(2):209–212.
8. Trezubov VN, Arutjunov SD, Fadeev RA (2003). A look at the boundaries of orthodontic treatment. *Stomatolog info* 12:4–5.