INTERDISCIPLINARY APPROACH IN A TREATMENT OF THE PATIENT WITH CLEFT LIP AND PALATE – CASE REPORT

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Abstract

Background: Therapy of patients with cleft lip and palate does not comprise only surgical closure of the cleft – it requires multidisciplinary approach in a dental treatment, with the aim to achieve aesthetically and functionally optimal results.

Case report: 12-years-old patient, referred to the orthodontic clinic with surgically closed unilateral cleft lip and palate. After taking diagnostic records, the patient was scheduled for orthodontic treatment. Before banding, crown lengthening on first upper molar has been performed due to a short clinical crown. Length of active orthodontic treatment was 30 months, after which retainer has been placed, and patient scheduled for crown lengthening on upper left incisor and canine. Multiple tooth restorations have been performed on upper anterior region using adhesive, build - up technique (teeth 13, 21, 22, 23). Dental photography editing with image editing software enabled information about possible aesthetic solution for our patient.

Follow up: Clinical evaluation of composite restorations has been performed using USPHS criteria. Functionality, pleasing aesthetic results and satisfied patient are outcome of 4 years long comprehensive dental treatment.

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Introduction

Cleft lip and palate (CLP) is a congenital malformation characterized by morphologic changes and deficiencies of soft and hard tissues in oral and maxillofacial region. The prevalence of cleft lip and palate among population has been estimated between 1:500 – 1:2500 live births[1,2].

This congenital deformity shows a multifactorial and complex etiology, where genetic and environmental factors cause abnormal facial development during gestation.

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Cleft lip and palate is usually associated with different dental anomalies. Several authors report crown and root malformations, delay in tooth development/dental maturity, anomalies in tooth structure and size, variation in the number of teeth (oligodontia)[3-6]. Aesthetic and functional disturbances are often associated with cleft lip and palate that require early medical, surgical and dental interventions, which start early after birth and continues in various stages until maturity[7].

Patients with cleft often born with some missing teeth, where the lateral incisor in the line of cleft is usually absent, that can create additional functional and aesthetic problems. Treatment plan should be made individually, made by a team of dental specialists, including maxillofacial and oral surgeons, orthodontists, pediatric dentists, prosthodontists in order to perform treatment for these patients with the best result.

Children with cleft lip and/or palate require a multidisciplinary approach in which different specialist are involved. The team concept remains the key to success in the care of these patients[8]. Due to that, some parents seek care for children in cleft palate or craniofacial treatment centers, if exists. No matter cleft can produce variety of oral problems; a child with a cleft lip/palate requires the same regular preventive and restorative care as the child without a cleft.

Case Report

In 2002, 12-years-old female patient, referred to the orthodontic clinic after surgical correction of unilateral clef lip and palate. After taking diagnostic records, orthopantomography and cephalometric analysis, patient was scheduled for comprehensive dental treatment with following diagnosis: status post op. cheilognathopalatoshisis, with consequent pseudoprogenia and progenia vera, hypodontia of upper right incisors (teeth 12, 11), rotation of upper premolars and palatinal position of tooth 25.

Figure 1.
1a. Plaster models of the patient before the therapy with mobile functional appliance.
1b. Plaster models of the patient before the therapy with fixed orthodontic treatment.
1c. Plaster models of the patient after completing of active orthodontic treatment.

Orthodontic treatment was planned in two phases. In first phase (2002-2003) mobile functional appliances have been used, in order to achieve somewhat better position of bone segments to provide underlying framework for soft tissue. Second phase begin in 2004 when full fixed orthodontic treatment begun, with use of Roth 0.22 bracket system, transpalatal arch as additional anchorage due to palate cleft, and band on upper molar teeth. Patient's mother rejected orthognatic surgery after completing of orthodontic treatment. Before banding, crown lengthening on first upper molar has been performed due to a short crown. Length of treatment was 20 months - retainer had been placed after, and patient scheduled for crown lengthening on upper left incisor and canine (Figure 1,2).

Figure 2.
2a. Orthopantomography before any orthodontic treatment started.
2b. Orthopantomography during fixed orthodontic treatment.

Surgical crown lengthening has been proposed to improve restorative procedures and preventing periodontal injuries in teeth with structurally inadequate clinical crowns or exposing tooth structure in the presence of deep, subgingival pathologies which may hamper the

access for proper restorative measures.

Periodontal surgical procedures consisting of gingival flaps and osseous recontouring are indicated for crown lengthening of several contiguous teeth in the esthetic zone; both in cases where restorations are required and in cases where no restorations are planned, such as in patients with excessive gingival smile due to altered passive eruption[9,10]. Subepithelial connective tissue graft is one of the most used periodontal plastic surgery procedure in cases that already show recession defects (Miller class I and II). In our case crown elongation, as a surgical procedure on central incisor, showed satisfying clinical result, without any signs of recession.

In 2007, after orthodontic and surgical crown lengthening treatment, patient had been scheduled for conservative treatment of pediatric dentist in order to find satisfying optimal aesthetical solution for the patient (Figure 3).

Figure 3. Face of the patient and dental status after finishing orthodontic treatment, before starting multiple tooth restorations.

Possible prosthodontic and conservative treatments had been discussed in order to decide if the better approach was veneers, crowns or composite build-up technique. Respecting the patient's age, patient started with conservative teeth restoration, using direct restorative approach. Teeth morphology had been modified with adhesive techniques in order to achieve satisfying functional and aesthetic goals (position, shape and color).

Multiple tooth restorations have been performed on upper anterior region (teeth 13, 21, 22, 23), in four dental visits. Canine teeth were reshaped in lateral incisors, tooth 22 in a central left incisor and tooth 21 in a right central incisor.

In all teeth, the enamel surface was etched with 37% phosphoric acid for 30 seconds (Eco - Etch®), due to additional micro retention, no matter that self-etching system was planned to be use after. On already prepared enamel surface, self – etching system AdheSe® (Ivoclar Vivadent) has been additionally used. Build-up technique (dental composite bonding) for teeth restoration has been performed using light – curing ARTEMIS® composite (Ivoclar Vivadent) (Figure 4,5).

Figure 4. Direct composite restorations of teeth 21 and 22.

Figure 5. Direct composite restorations of teeth 13 and 23.

During dental visits, while tooth restorations using build up technique have been performed, digital dental photography was taken with non-professional digital camera (Nicon Coolpix P50, 8.1 megapixels). Dental photography editing, with image editing software Adobe photoshop 6.0, enabled information about possible aesthetic solution for our patient regarding teeth morphology and size variations. Using this software, the optimal esthetic has been achieved with saving the time spent on dental chair for the patient and dentist as well.

Follow up: Clinical evaluation of composite restorations has been performed using modified USPHS (United States Public Health Service) criteria[11].

Discussion

Orthodontic treatment of patient with CLP should be performed in phases. The recommendation is to avoid continuous active treatment in early childhood, because these patients are often seeking some more medical procedure (ENT, speech therapist, maxillo-facial or plastic surgeons, etc).

Our treatment was performed in two phases. First phase was 1 year long and second one - 20 months. Due to previously performed operation, mother refused orthognatic surgery as a part of treatment plan, so we discuss the alternatives, and the plan was to align the teeth and achievement as much contact points as possible for good occlusion and then restoration of the teeth. After completing of permanent dentition, fixed orthodontic treatment started in 2004, and finished in 2007.

Due to the fact that patients with CLP usually have different dental anomalies, beside surgical and orthodontic treatment, very often these patients require comprehensive aesthetic dental treatment. In older patients, anomalies in size, shape and number of teeth can be solved using different prosthodontic solutions. But, regarding the age of the patient, one of the possible solutions was teeth reshaping using adhesive technique. This technique is time consuming and requires specific personal skill of the therapist. But on the other hand, it is non-invasive, repeatable, and comfortable for the patient. Using light – curing ARTEMIS® composite, with wide range of shades and various degrees of translucency, we were able to match the colors until we found satisfying aesthetic solution.

Multiple tooth restorations have been performed on teeth 13, 21, 22, 23. Even after orthognatic treatment, patient stayed with disharmonic dental arches. Very high positioned central incisor in the oral vestibulum, near to the line of the cleft, with mesio-distal inclination, followed with wide diastema, limited our therapy. During teeth restorations with dental adhesive systems, digital photography was taken in order to find the best aesthetic appearance between two dental visits. Image editing software (Adobe photoshop 6.0) enabled information about possible treatment for our patient regarding teeth morphology and size variations. Treatment's plan was done respecting total face and dental appearance (Figure 6).

Figure 6. Possible solutions in teeth remodelation using image editing software.

As it can be seen, we intentionally reshaped teeth on the way that certain disharmony still exists. Incisal edge of frontal teeth is not "perfectly" aligned intentionally – incisal edge of remodelated tooth 22 is longer comparing with tooth 21. The reason why we choose it on that way is the line of cleft lip which is on the right side of the face. With tooth 22 reshaped in central incisor, one millimeter longer than tooth 21 on the left patient's side, we succeed in delusion of "optically decreasing" lip cleft, while patient smiles. No matter the direct restoration technique is demanding in the sense of personals skills of a therapist and time

consuming for the dentist and patient too, the outcome of this treatment seems to be very satisfying (Figure 7).

Clinical evaluation of composite restorations in the term of anatomic form, color match, marginal discoloration and adaptation, retention, secondary caries and sensitivity, has been performed using modified USPHS (United States Public Health Service) criteria at 3, 6, 12 and 24 months interval.

Figure 7. Status praesens on the first control check-up.

Conclusions

Functionality, pleasing aesthetic results and satisfied patient are outcome of a comprehensive dental treatment.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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