

Rehabilitation of Bilateral Cleft Lip and Palate in Adult Patient with Modification of Maxillary Overlay Cobalt Chromium Obturator

Case Report

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Abstract

Cleft lip and palate can result indiscontinuity of the oral-nasal and maxillary sinus cavities. It can have a devastating effect on a patient's appearance and speech. Prosthetic rehabilitation is usually required to cover the defect and to restore normal functions. Retention of the obturator is a significant problem while rehabilitating large defects. A suitable technique for fabrication should be selected to achieve this. This article presents the prosthodontic rehabilitation of a congenitally bilateral cleft lip and palate on an adult patient with a distinct method to fulfill the patient's needs, esthetics, and psychological well-being. The treatment plan was to provide her with maxillary overlay cobalt-chromium obturator. A cobalt-chromium framework with a special design was fabricated to aid in the retention. The antral bulb, which covers the defect, was modified and fabricated with a distinctive hollow design. Aesthetics was achieved and patient-reported satisfaction with the outcome.

Keywords: Bilateral Cleftlip and Palate; Cobalt-Chromium Maxillary Obturator; Maxillary Obturator.

Introduction

Rehabilitating patients with cleft lip and palate with missing foremost teeth and insufficient alveolar ridge presents a difficult task for the dental practitioner. A comprehensive rehabilitation strategy that includes multidisciplinary treatment planning by surgeons, orthodontists, and restorative dentists should be considered for each case [1]. While bone grafting and orthodontics are the preferred treatment for the cleft area; several patients are rehabilitated with a variety of prosthetic treatment, including conventional implant-supported removable partial dentures, fixed prosthodontic treatments, multi-unit veneered resin bonded, fiber-reinforced composite resin bonded, a removable partial denture with extra coronal attachment and combination of fixed and removable dental treatment [2, 3]. The aim of maxillofacial prosthetic rehabilitation is to restore the esthetic and functional health of patients with craniofacial defects. Prosthetic rehabilitation is typically required in the form of a palatal obturator to replace the defect and promote better oral functions. This enables patients to eat and drink during mastication without fear of having food or drink, reaching the oro-nasal and oro-antral cavities. In the cases of patients with minimal dentition, the application of an obtura-

tor becomes even more difficult as the mechanism of retention is compromised. A palatal obturator provides better retention and stability and requires proper design for long-term use. The conventional method has a hollow antral part but usually a solid oral part, which adds to the weight of the prosthesis, pressurizing the soft tissues, which affects the function and esthetics. This article demonstrates the modification of the antral bulb, which covers the defect. It was designed considering the potential difficulties shared by the patient is wearing the conventional closed hollow bulb design. This technique, when followed, was beneficial in reducing the weight of the prosthesis and enhancing retention and allowed the patient to perform regular functional movements.

Case Report

A 48 years old Chinese lady was referred to the Department of Restorative at the University Malaya, Malaysia, due to her complaint of looseness of the maxillary obturator following repeated fracture of her denture, which leads to difficulty in eating and chewing. She was diagnosed with a complete repaired bilateral cleft of the lip, primary and secondary palates. Partial medical history revealed that she underwent multiple cleft repaired surgery

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and had been wearing an obturator for more than 20 years. The present obturator was fabricated in 2010 with numerous repairs that had been made. Clinical examination revealed severe loss of dental hard tissue with the presence of sizeable oro-nasal fistula with little or no alveolar ridge, especially on the right side. Displaceable tissues were noted surrounding the defect area (Figure 1). The radiographic findings revealed a generalized horizontal bone loss of 2/3 root length of teeth with no alveolar bone noted on the anterior region present, and radiopacity noted on the right and left zygoma region indicating the plate screw (Figure 2). Treatment planning was to provide her with maxillary overlay cobalt-chromium obturator.

The primary model of each jaw was made. Maxillary final impressions were taken using regular body polyvinyl siloxane impression material (GC Exaflex regular, GC America, Alsip, USA). It was poured with type III dental stone (Elite Rock, Zhermack SpA, Via Bovazecchino, Badia Polesine, Italy) to produce a working cast (Figure 3). The master cast are duplicated, and the refractory cast was obtained. The unique design of the framework was made with overlay coping with cobalt-chromium (Figure 4(a) and 4(b)). Fitting was done intraorally (Figure 4(c)). Maxilla-mandibular relationship in centric relation was registered and transferred on a semi-adjustable articulator (Protar Evo 5, Kavo, Illinois, USA), and teeth setting were done (Figure 5). The wax obturator was

tried in the patient's mouth and checked for correct extension and aesthetic. Then, the obturator was processed with an open hollow bulb design. The prosthesis was issued to the patient after confirming the stability, retention, and the patient's comfort. On subsequent review visit (four weeks followed by six months), the patient was pleased as her aesthetic and functional compromised has been restored and met her expectation).

Discussion

For this patient, treatment consisted of providing her an overlay cobalt-chromium open bulb obturator. In this case, the presence of a large oro-nasal fistula dramatically compromised the stability, retention, and support for the denture. The non-resilient nature of the peripheral tissues can make it challenging to achieve an adequate peripheral seal. Based on the technique mention by research, the utilization of the metal crown coping as an overdenture will slightly improve the retention and stability of the obturator [4]. According to same study, the portion of the overlay denture, which in direct contact with the dentition, should never be made with acrylic resin. The porous resin harbors a multitude of microorganisms, and as a result, the overlaid dentition will soon become carious despite good oral hygiene [4]. The risk of caries of the overlaid dentition will be substantially reduced if the

Figure 1. Preoperative intraoral view of the patient.



Figure 2. Preoperative dental panoramic radiograph.

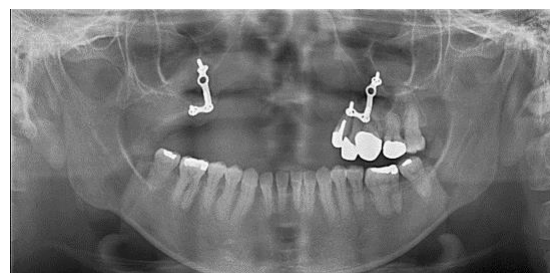


Figure 3. Secondary impression materials and a master dental cast of the maxillary arch.



Figure 4. Cobalt chromium framework and try-in of framework.

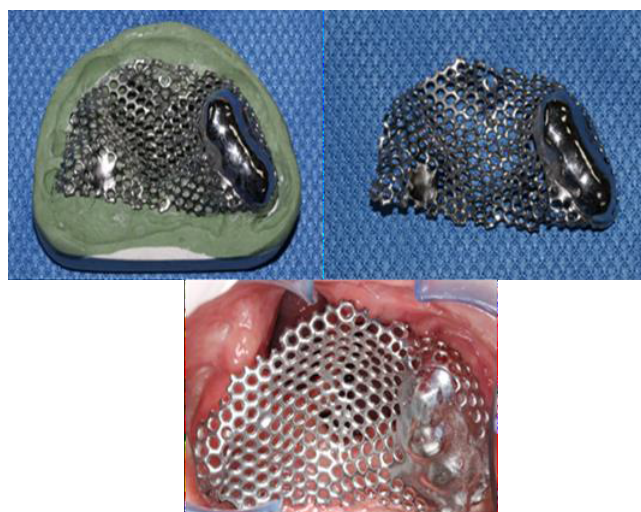


Figure 5. Occlusal view of teeth setting on the working cast.



portion of the prosthesis that overlays the dentition is fabricated in metal. Rehabilitation with an obturator prosthesis on a larger defect area could be problematic because its vertical extension has to be large enough to cover the entire defect making it heavy, uncomfortable, and challenging to adapt to [5]. Obturators can be fabricated in an open or closed hollow prosthesis with many different methods available [6]. It is known that the open hollow bulb obturator is easier to fabricate and adjust. However, it is difficult to polish and clean the open hollow bulb obturator. The polishing process on the fitting surfaces of the acrylic part, that located in the defect zone, can be considered as a pool, cannot be performed thoroughly [7]. This may lead to the accumulation of food and nasal secretions inside the hollow part and, in turn, leads to malodor, an increase in weight, and chances of infection. Relatively, in this case, the design of the open obturator was chosen and was design such a way for the patient to clean it easily. The wall height of the obturators entering specific proportions within the nasal defect contributes to the separation, stability, and retention; therefore, it can lead to better aesthetic and phonation of the patient. The shape and height of the obturator wall are essential, but it should be noted that the weight of the obturator will also lead to the loss of restraint and even to the dislodgement forces in the supporting teeth [8, 9]. Furthermore, the extension of the obturator was made into the nasal defect area to achieve the retention and stability of the prosthesis. Open space obturators with a low medial wall height have been reported to be more successful as compared to the closed bulb [10]. Concerning the nasal extension, with these types of unfavorable defects, it may be beneficial to extend the obturator into the nasal aperture or onto the nasal surface of the soft palate to augment retention.

According to Pigno and Funk 2001, total engagement of the nasal aperture space will significantly increase obturator retention [11]. When completely engaging the space area, it is crucial to access a specific insertion route that is commonly used for placement and removal of the obturator. Fabrication of such design, in this case, was to improve the weight, retention, and stability of the prosthesis.

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