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CASE REPORT

Construction of a modified overdenture for patient with cleft lip and palate surgery sequels: case report

Elaboración de una sobredentadura modificada para paciente con secuelas quirúrgicas de labio y paladar hendidos: reporte de un caso

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ABSTRACT

Rehabilitation of patients suffering from cleft lip and palate surgery sequels is still a challenge for health professionals related to both surgical and prosthetic fields. These patients require a multidisciplinary treatment able to offer the best possible rehabilitation alternative. The present article presents a case of total rehabilitation of a patient with sequels to cleft lip and palate surgery (loss of vertical dimension, nasal collapse, upper lip defect, upper and lower jaw discrepancies, oro-antral fistulae, absence of upper incisors) by means of a modified over-denture (with absence of endodontic treatment). Esthetic and functional results achieved with this treatment were satisfactory as well as achieved in a short period of time.

RESUMEN

La rehabilitación de pacientes con secuelas de labio y paladar hendidos todavía sigue siendo un reto para los profesionales de la salud, tanto desde el punto de vista quirúrgico como del protésico. Estos pacientes necesitan de un tratamiento multidisciplinario que ofrezca la mejor alternativa de rehabilitación para el paciente. En este artículo presentamos la rehabilitación integral de un paciente con secuelas de labio y paladar hendidos (pérdida de la dimensión vertical, colapso nasal, defecto del labio superior, discrepancia del maxilar y la mandíbula, fístulas oro-antrales y ausencia de incisivos anteriores superiores) por medio de una sobredentadura modificada (sin hacer tratamiento endodóntico). El resultado estético y funcional con este tipo de tratamiento fue satisfactorio y se realizó en un periodo corto de tiempo.

Key words: Cleft lip and palate, prosthetic rehabilitation, modified over-denture.
Palabras clave: Labio y paladar hendidos, rehabilitación protésica, sobredentadura modificada.

INTRODUCTION

Cleft lip and palate are congenital craniofacial malformations caused by the lack of union among those embryonic facial processes responsible for the origin of these structures.[1] Lip and palate are formed during the sixth to ninth week of intrauterine embryonic development.[2,3] Secondary palate develops from lateral palatal prolongations of the fronto-nasal process which fuses to the nasal septum. Lip and palate malformations impinge on respiratory, deglutition, articulation language audition and voice mechanisms of affected patients.[4]

These patients frequently sustain sequels which communicate oral and nasal cavities, with resulting facial deformities.[5,6] The most common treatment would be surgical although there is a prosthetic alternative. Surgical treatment entails several surgical interventions which achieve long term results. As an alternative, prosthetic rehabilitation can be undertaken. According to the case, rehabilitation might encompass treatment such as removable or fixed prostheses, full dentures, over dentures which might include, when necessary obturator devices. [7,8]

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In general terms, rehabilitation requires manufacturing of custom-made non-conventional prostheses. This type of prostheses carry several advantages, among them the fact of being a non-invasive treatment, achieving in a short time acceptable functional and esthetic results when compared to surgical treatment, as well as being affordable for almost any patient.[6,9,10]

At the Maxillofacial Prosthesis Clinic, National School of Dentistry, National University of Mexico (UNAM) a patient afflicted with ectodermal dysplasia and cleft lip and palate sequels was rehabilitated with a non-conventional over-denture. Nevertheless, it is important to observe that every case requires custom-made specifications. In the present article we present the case of a female patient afflicted with cleft lip and palate surgery sequels to whom a modified obturator over-denture prosthesis was custom-made built.[11]

OBJECTIVE

To build a modified over-denture which might re-establish masticatory, phonetic and esthetic functions in a patient with cleft lip and palate surgery sequels.

MATERIALS AND METHODS

Patient: 17 year old female patient previously subjected to several corrective surgeries. She presented cleft lip and palate surgery sequels (oro-antral fistulae, nasal collapse, loss of vertical dimension as well as dental and lip incompatibility) *(Figure 1)*.

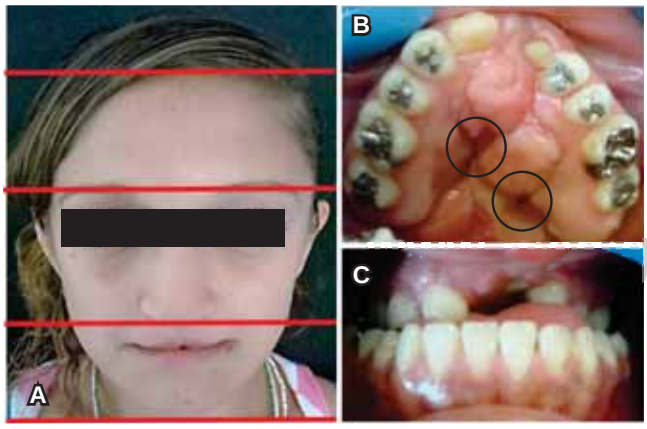

Figure 1. Patient with cleft lip and palate surgery sequels. **A.** Nasal collapse, lip incompatibility and loss of vertical dimension (horizontal lines). **B.** Oro-antral fistulae (circles). **C.** Discrepancy between upper and lower jaw.

Treatment: treatment selected was to build a modified obturating over-denture so as to correct patient's surgery sequels and achieve fistulae closure.

Impressions: primary impressions were taken with alginate (Geltrate Chromatic®, Dentsply) as well as pre-fabricated spoons (Dent-Tray® II Sultan Health). Cotton was placed on the fistulae so as to avoid passage of impression material into the nasal cavity.

The positive version of the impressions were achieved with type III gypsum (Quick Stone®, Whip Mix). With knowledge acquired from the models,

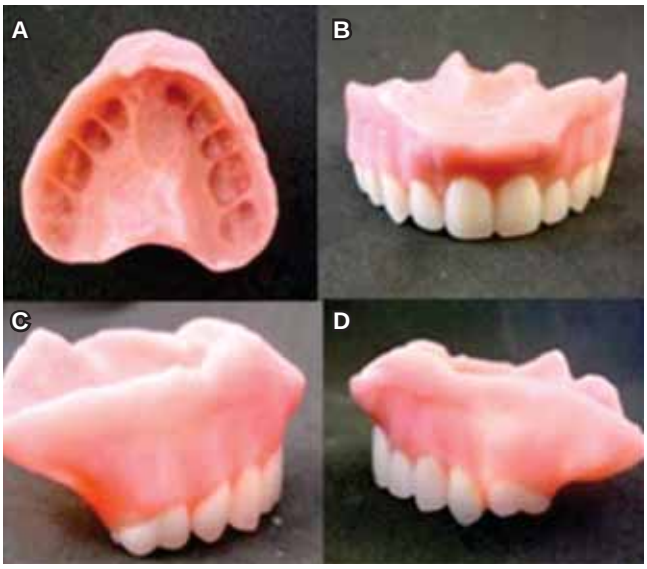

Figure 2. Trimmed and polished prosthesis. **A.** Upper view. **B.** Front view. **C.** Right lateral view. **D.** Left lateral view.

Figure 3. Vertical dimension compensation. View of patient without prosthesis (left) and with prosthesis in place (right).

an individual spoon was built for the upper arch. A new impression was taken with polysulfide rubber (Permlastic® Kerr). The positive version was obtained with the use of type IV gypsum (Silky Rock® Whip mix). Afterwards, a number 60 rigid acetate base was built (Soft-Tray® Sheets, Ultradent) to provide better insertion way to the teeth and avoid excessive pressure on dental papillae.

MODEL MOUNTING

Plaster models were mounted on a semi-adjustable articulator (Articulator 8500® Whip Mix) with the help of a facial arch, a wax roller was placed, making sure it exhibited required height to compensate the loss of vertical dimension. At a later point, teeth were placed at 22° (Vitapan ® Ivoclar). Teeth were articulated in compliance with the lower occlusal plane.

SPECIFIC MODIFICATIONS

Once the teeth were placed, a wax flange was placed in the anterior section so as to project the upper lip and thus compensate existing lip incompatibility. The prosthesis was then festooned; a coat of adhesive used for acrylic-rubber was then placed (Universal Adhesive® Kulzer) at the base of the acetate. At a later point, a second impression was taken with polysulfide rubber, so as to achieve an impression with high tissue fidelity. The positive version was achieved with type III gypsum (Quick Stone®, Whip Mix).

MUFFLE PROCESSING

Once the second impression was achieved, the prosthesis was directly placed in a muffle. A heavy-body silicon coating (Speedex® Coltene, Whaledent) was applied to the articulated teeth in order to achieve a cleaner and easier way to polish prosthesis. Once the muffle phase was completed, the prosthesis was de-waxed and acrylic was applied.

FINAL DETAILS

The prosthesis was finally withdrawn from the muffle. It was then trimmed and polished to a high gloss with a grinder engine (High Speed alloy Grinder AG05®, Ray Foster) pink mounted stone (® YINJILI) as well as polishing cloth and materials [Polycril®, *(Figure 2)*].

Areas that could exert excessive pressure on the tissues were removed, and then assessed with the help of a pressure indicator paste (Pressure Indicator Paste®, Sultan Health). With the help of articulator paper (Progress 100® Bausch) some selective adjustments were performed.

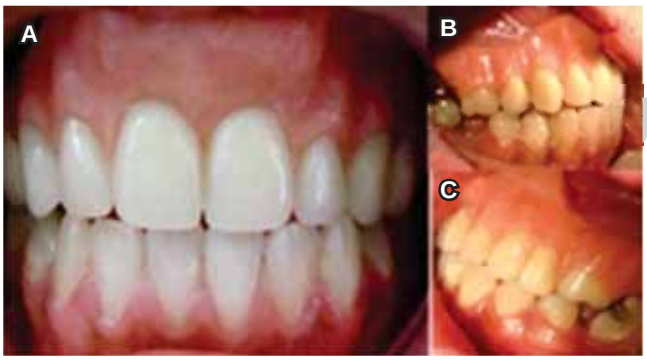

Figure 4. Intra oral tests. **A.** Occlusion. **B.** Right lateral relation. **C.** Left lateral relation.

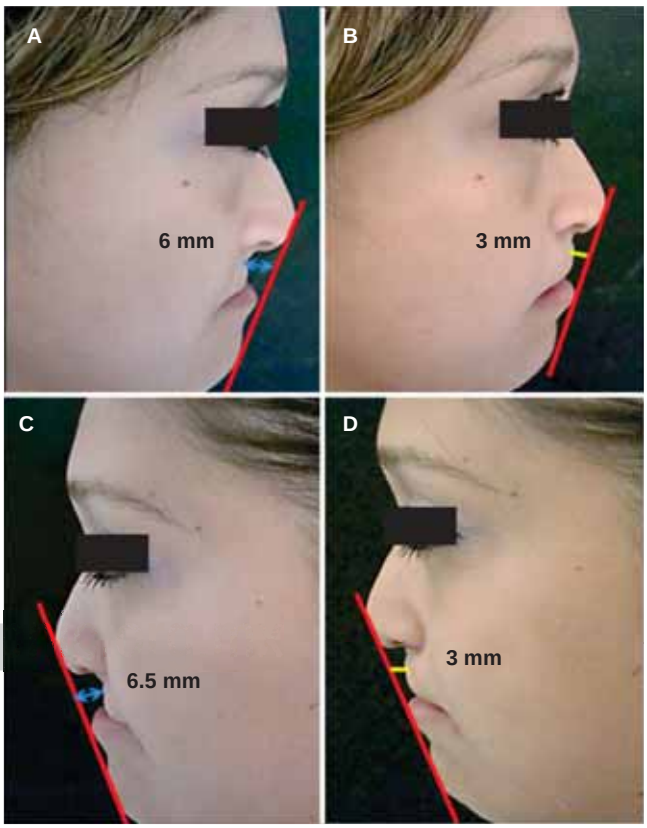

Figure 5. Lateral views without prosthesis and with prosthesis in place. **A.** Right profile without prosthesis. **B.** Right profile with prosthesis in place. **C.** left profile without prosthesis. **D.** Left profile with prosthesis in place.

Figure 6. One year patient follow-up. View without prosthesis (left) and with prosthesis in place (right).

RESULTS

The prosthesis compensated the loss of vertical dimension; it rendered the lower third proportionate to the other two facial thirds. The face then acquired a sharp and elongated aspect *(Figure 3)*; with this, a pleasant and esthetic smile was achieved.

The patient informed that the prosthesis was comfortable and easy to wear when occlusal intra-oral *(Figure 4A)* and lateral movement *(Figures 4 B and C)* tests were performed.

Lip incompatibility exhibited by the patient was improved by 3 mm on the right side *(Figures 5A and B)* and 3.5 mm on the left side *(Figures 5C and D)*. As a whole, the prosthesis allowed correction of the upper lip defect, afforded greater support to the nasal columella, promoted removal of expression lines (which gave the impression of an older subject) improved occlusion and therefore mastication. Notwithstanding all the aforementioned, one of the most important aspects was the increase of patient self-esteem, as per her own words.

At the one year follow-up visit the patient presented a functional and comfortable prosthesis which met all esthetic, phonetic and masticatory expectations *(Figure 6)*. The patient informed that, with the prosthesis, she felt more self-assured, had become more extroverted, and all those around her observed a favorable change in her life.

DISCUSSION

Cleft lip and palate surgery patients' sequels are frequently treated with surgical procedures, or other conventional prosthetic procedures. Nevertheless, prosthetic treatment with a non conventional overdenture such as the one described in the present article, afforded advantages such as short-term functional and esthetic rehabilitation. This type of prosthesis can be used as a permanent or transitional solution, while deciding upon some other procedure. It presents the great advantage of not requiring endodontic treatment, or for that matter, any other treatment on dental structures. Additionally, it was a low-cost treatment providing satisfactory esthetic and functional results. It was a very meaningful treatment for the patient.

CONCLUSION

Based on the aforementioned results we can conclude the following: A modified overdenture was built; it provided rehabilitation of this particular patient, met the objectives set at the beginning of treatment and restored phonetic, esthetic and masticatory goals.

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