

## Management of Oro-Nasal Fistula Using Andrew's Bridge: A Case Report

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**Abstract** Oro-nasal fistula is the most common complication following the surgical closure of the cleft palate. Retention is the paramount factor in the successful prosthodontic habilitation of cleft palate patients. Various precision attachments have provided us with the opportunity to make the prosthesis fixed removable type; giving a double advantage to the patient i.e. comfort through fixed type and easy maintenance through removal type. This case report describes a case of oro-nasal fistula habilitated with an obturator attached to Andrew's bridge, which had good retention and esthetics.

**Keywords** Oro-nasal fistula · Andrew's bridge · Obturator

### Introduction

The palatal defects can be either congenital or acquired. In India, the incidence of cleft lip and palate is 1 in 500 live births and majority of these patients are not treated surgically at the appropriate time [1]. Palatal fistula is a common complication arising out of cleft palate repair and its occurrence ranges from 0–34 % as observed in various studies [2]. It was found statistically that the width of 15 mm or more had a significant risk of fistula formation [3].

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Smith et al. [4] classified the palatal fistula into seven types:

Type I—referred to bifid uvula.

Type II—means fistula in the soft palate.

Type III—means fistula at junction of the soft and hard palates.

Type IV—means fistula in the hard palate.

Type V—indicates that the fistula at junction of the primary and secondary palates.

Type VI—means lingual alveolar fistula.

Type VII—means labial alveolar fistula.

The patient with a unilateral or bilateral cleft palate, missing anterior teeth and a deficient alveolar ridge presents the problem of restoring the missing teeth and the alveolar ridge.

Oronasal fistula cause hyper nasality due to escape of air during speech and also may lead to regurgitation of food and fluid to the nasal cavity [5]. The dentists working in both rural and urban setups are liable to encounter these anomalies.

The increasing demand for esthetics in restorations can be met with any of ceramic restoration systems currently available. However, the esthetic value of a cosmetic restoration may be compromised by other factors contributing to the composition of a pleasant smile, such as amount of gingival display, gingival architecture, clinical crown dimensions and tooth position.

The major prosthetic treatment to close the soft tissue defects were; obturator, removable flange prosthesis, Andrews bridge and surgical bone augmentation.

When treating cleft palate patients with congenital or acquired defects, the Andrew's bridge permits rehabilitation with a fixed removable partial denture as an alternative method for conventional procedure. This system permits the replacement of the missing teeth as well as missing supporting structures necessary for proper function and aesthetics [6].

## Case Report

An 18 year old female was referred to the Department of Prosthodontics from the Department of Oral and Maxillo-facial Surgery, Rajarajeswari Dental College and Hospital, Bangalore, for the prosthetic rehabilitation of the palatal fistula after the primary surgical closure of cleft palate.

Relevant dental history revealed that patient had a congenital cleft lip and palate. Surgical correction of cleft lip was done at the age of 3 months. At the age of 4 years, primary surgical closure of palatal cleft was performed, but was complicated by palatal fistula. Again at the age of 16 years, one more surgery was carried out to close the palatal fistula, but the surgery was a failure again. She underwent orthodontic correction of misaligned teeth which was completed 1 month back before she visited the Department of Prosthodontics.

Intraoral examination revealed maxilla with a Veau's class III defect [7] (unilateral cleft lip, alveolus, hard and soft palate) and missing left lateral incisor. A palatal fistula (class IV) [4] measuring 5 mm in diameter was present in the anterior part of the hard palate (Fig. 1). She complained of having nasal escape of fluids and food through the palatal hole.

Extra oral examination revealed a surgical scar on the upper lip due to previous surgical correction of cleft lip. Her speech was not intelligible with a nasal twang in her voice lacking resonance.

Considering her age and oral conditions we planned to habilitate with an obturator which would be simple in design, light weight, fixed type but easily maintainable prosthesis—obturator attached to Andrews's bridge (fixed removable). The Andrews bridge consists of a metal bar and sleeve. The principle of the system is similar to that of an intracoronal attachment. The pontic portion of the fixed removable partial denture is removable. This permits access to the underlying tissue for cleansing purposes. The Hader bar was planned between 21 and 23 attached to metal ceramic crowns. Because of large pulpal spaces, intentional endodontic treatment was performed and teeth



**Fig. 1** Oro-nasal fistula and coping and bar assembly try in



**Fig. 2** Try-in after ceramic buildup



**Fig. 3** Tryin of wax up—removable component

were prepared to receive porcelain fused to metal restoration (21 and 23).

Impression was made with elastomeric impression material. Wax copings were prepared on 21 and 23. The plastic bar pattern was adapted to anterior-posterior and superior-inferior availability to accommodate artificial teeth and the retentive components. The gingival extension of the bar was reduced to proper height and approximate gingival contour. The nylon retention riders were placed on the bar, positioned on the model, and checked against the opposing model on the articulator making sure that there was adequate vertical space for the denture teeth. The riders were removed from the bar pattern. The bar pattern is waxed directly to the abutment copings.

The cast copings (Co–Cr) and bar was tried in the mouth (Fig. 1). The assembly was tried again in the mouth after ceramic buildup (Fig. 2). The plastic riders are placed in the proper positions on the bar on the master model. The undercuts of the bar are blocked out. Also block out over the retainers. An impression is taken of the master cast with the riders in position. The fabricating rider was positioned in the impression and a duplicate processing cast poured. The fabricating rider will be held in proper position in the duplicate cast by the extensions of the riders in the stone. The metal housing was slide onto the fabricating riders of the duplicate cast. Missing lateral incisor was replaced with two teeth as there was more space. The teeth arrangement was done and tried in the mouth (Fig. 3). To this a palatal extension was given to close the fistula.

This was acrylicized with heat cure acrylic resin. The Hader nylon retention riders are pressed into the prepared receptacles into the metal housings (Fig. 4). Finishing and polishing of the removable part of the Andrew's bridge was

**Fig. 4** Removable component of the Andrews bridge



**Fig. 5** Postoperative—facial view



**Fig. 6** Postoperative—occlusal view

done was inserted in the patients mouth (Figs. 5, 6). Patient was trained for proper placement and removal of the Removable dental prosthesis. The patient was instructed on oral hygiene procedures and proper maintenance of the prosthesis.

On recall the patient was quite comfortable with the prosthesis and psychologically the patient benefited by improved aesthetics and speech. Recall appointments were scheduled for 1 week, 1 month and 3 months.

## Discussion

Prosthodontist play a very important role in complete rehabilitation of cleft lip and palate patients for successful rehabilitation of such patients, a team approach of concerned specialist with phase wise, unanimous and systematic treatment plan is essential. Prosthodontic rehabilitation

of these patients is usually around the age of 20, before which the patient will be treated by surgeons for surgical primary closure, orthodontists for alignment of teeth and finally by prosthodontist for the replacement of missing teeth and obturation of the defect.

Palatal fistula is a common complication of cleft palate surgical repair observed in different studies and to correct inevitable sequel of the surgery, the prosthetic rehabilitation with obturator is an auxiliary or complementary treatment to surgical treatments.

Advantages of attaching the obturator to Andrews bridge are, though the prosthesis is a removable prosthesis it acts as a fixed prosthesis due to incorporation of precision attachment. Retention and stability of the prosthesis is improved due to the attachment, size of the prosthesis was minimized with reduced palatal coverage where patient had normal proprioception and taste perception. Patients comfort is enhanced.

A fixed removable obturator provides a psychosocial confidence and comfort. With Andrew's bridge we were able to restore the missing supporting tissues with the teeth.

## Conclusion

Fabrication of the fixed removable prosthesis is obturator attached to Andrews bridge is a time consuming, labor intensive, artistic job. The art of replacing missing teeth, defect has been carried out for many years. Surgical reconstruction was not possible in this case and needed prosthetic rehabilitation. The technique has presented an Andrews bridge which was a fixed removable type of prosthesis the obturator was light weight which was attached to the removable part of the Andrews bridge. This promotes the physical and psychological healing for the patient and improved the esthetics. Thus the accumulation of positive effect with psychological confidence and comfort as a result of the use of Andrews bridge for a Oronasal fistula has undoubtedly improved the quality of life of the patient.

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