

Prosthetic rehabilitation of class III Seibert defect in patient with ectodermal dysplasia using ingenious bar attachments – A case report

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Abstract

Aim: Diminution in size of alveolar ridge is a challenge for rehabilitation. The speech and esthetics are compromised in class Seibert III ridge defects. This case report describes the fabrication of customized bar attachment for rehabilitation of Seibert class III anterior defect.

Background: The orofacial characters of Ectodermal dysplasia include hypodontia, hypoplastic conical teeth, under development of alveolar ridges, frontal bossing and hypotrichosis. The complex treatment plan includes fixed dental prosthesis, removable prosthesis and Fixed-removable prosthesis.

Case description: Class III defects can't be treated with conventional fixed prosthesis, as they does not provide support for lost tissue structures. In Ectodermal dysplasia hypoplastic conical teeth along with vertical ridge defect represents a complex treatment plan. The definitive treatment plan includes FDP's of conical teeth and bar attachment to support RPD prosthesis.

Conclusion: Combination of fixed and removable prosthesis fulfills the requirements of phonetics, esthetics and hygiene maintenance. FDP provides the support for prosthesis, adequate form and function of malformed tooth. The removable component replaces lost hard and soft tissues which provides the esthetic restoration, and provide support for periodontal structures.

Clinical Significance: The prosthesis had definitely improved patient's self-confidence. Customized attachments are usually cost effective. The fixed-removable prosthesis is one of the best ways for rehabilitation for severe class III Seibert defect in the anterior region.

Keywords: Seibert class III, customized attachments, ectodermal dysplasia, Tich buttons, fixed-removable prosthesis.

Introduction

Ectodermal dysplasia comprises of a large, heterogenous group of inherited disorders, in which two or more structures derived from embryonic ectoderm are affected, i.e., skin, hair, nail, sweat glands, part of eye, ear and dentition. They are classified as hypohydrotic and hidrotic. The most common type is X-linked recessive trait¹. Clinical features includes frontal bossing, sparse hair, protruded lips, prominent nasal bridge etc. Significant oral findings includes hypodontia, hypoplastic conical teeth, reduced vertical dimension and lack of alveolar ridge development. Localized alveolar defect is referred as a deficit in volumetric extent of bone and soft tissues within alveolar process².

Ectodermal dysplasia results in alveolar defects where ridge is deficit in both bucco-lingual and apico-coronal height classified as Seibert class III⁴. The replacement of missing teeth, lost soft tissue support possess a challenge for rehabilitation. Such anatomic defects severely compromises the esthetics. Class III defects can be restored surgically or conventionally. Surgical management is a complex treatment, so non-invasive treatment is usually preferred.

In long span defects, bar attachments are preferred because they splint the abutments together which provide even distribution of force to the abutments, and supporting areas. They have both fixed and removable components.

Bar attachments can be placed all over the edentulous ridge which restores the lost bulk by providing a support for removable component. Fixed components includes PFM crowns and bridges cemented to prepared abutments. Removable components are attached to the bar via nylon/silicone sleeves fixed in acrylic dentures. Various pre-fabricated attachments are available. These attachments are usually costly and require high technical skill for their fabrication, thus limiting their use to masses. In this case, the attachments were fabricated using "Tich buttons". They are highly economical and are easily available. The entire support of prosthesis is taken from abutment teeth, hence the longevity of prosthesis was dependent on fixed component. This case report explains the comprehensive management of Seibert's class III defect in patient with ectodermal dysplasia.

Case Description

A 24 year old female patient reported to OPD of department of Prosthodontics, Crown and bridge with chief complain of poor appearance because of missing teeth in lower front region of jaw. Extra oral examination revealed frontal bossing, sparse eye brows, protuberant lips and prominent nasal bridge. Intra-orally, patient had hypodontia with missing lower anteriors, hypoplastic bilateral mandibular 1st molars. Teeth present were 13,14,15,16, 21, 23,24,25,26, 35, 36, 45 and 46. Patient had severe class III Seibert defect in mandibular anterior region (Figure 1). The inter-arch space was around 25 mm between edentulous ridge and upper anteriors. The defect extended from 35 to 45. There was Class I ridge relationship present between the arches.

Owing to its long span defect, bar attachments were planned, taking support from abutments 35, 36 and 45, 46. The alveolar support around abutments were adequate. Over the bar, "tich buttons" were planned to be attached at 32 and 42 region. This position would restrict the rotation

of the prosthesis over it. These attachments would provide frictional fit. Conventional RPD was planned to be given in maxillary arch. The fixed-removable prosthesis would provide pleasing esthetics, improved phonetics and support for lost tissue bulk in anterior region.

Preliminary impression and tooth preparation

Preliminary impressions were taken using irreversible hydrocolloid and cast were poured in dental stone type III. After evaluating casts, permanent mandibular second premolars and mandibular first molars were chosen as an abutment. The abutments had good alveolar support with normal morphology to withstand occlusal forces. The abutments 36, 46 and 35, 45 were prepared to receive PFM crown (Figure 2). After assessing the margins and clearance, final impression was taken in poly-vinylsiloxane using putty-wash technique. Temporization was done by self-polymerizing acrylic using direct method.

Fabrication of Fixed component

Wax up was done for PFM retainers on 36, 46 and 35, 45. The retainers on both the sides were splinted to increase the support. The wax up for bar was done using hard red cervical inlay wax. The bar was kept parallel to the underlying alveolar ridge with a clearance of 2mm. the cross section of bar was kept square as it would restrict the rotation of removable component and would provide a frictional fit. The bar was kept 2-3 mm in height and width was waxed up 1mm less than the width of the alveolar ridge. The bar was attached to the retainers of premolars as posteriorly as possible. Putty index was made for ball part of “Tich button” (Figure 3). Hard red cervical inlay wax was poured into the index.

With caution, the wax was taken out of index and were attached to the bar in the lateral incisor region at 32 and 42 location (Figure 4). The whole pattern was casted in Co-Cr alloy. The metal framework trial was done to asses fit

and clearance of 2mm from soft tissues (Figure 5). Shade selection was done under natural sunlight using Vita 3D master shade guide. The temporary crowns were removed and crowns along with bar was cemented using GIC cement (Figure 6).

Fabrication of Removable component

With crown in position, impression was taken using irreversible hydrocolloid and cast was poured in dental stone type III. Trial denture base with occlusal rims was fabricated on bar. Jaw relations were done conventionally. Wax trial was done to assess esthetics and phonetics. The wax trial was acrylized in heat cure acrylic. After finishing and polishing, acrylic from the intaglio surface was removed for matrix attachment of “tich button”. The matrix part of attachment was place in the bar (Figure 7), and was picked up in RPD using cold cure acrylic (Figure 8).

The RPD was inserted in patient’s mouth in such a way that the matrix part gets attached to the patrix part of attachment over the fixed bar (Figure 9). The instructions were given to the patient regarding removal and insertion of the RPD over the bar. The patient was satisfied with the esthetics and phonetics (Figure 10).

Patient was advised to maintain oral hygiene. Regular follow-up was done at 2 weeks and 4 weeks interval to assess the oral hygiene and the fit of prosthesis. After two months, recall at interval of 3 months for initial 1 year followed by check up every 6 months was advised.

Conclusion

The fixed-removable prosthesis permits us to restore both congenital and acquired class III Seibert defects. These type of prosthesis are indicated in those cases where we have the abutments beside large tissue defects. The prosthesis had restores both the phonetics and esthetics. The patient was followed up for 1 year. The patient did not complained about any discomfort. The oral hygiene

status during follow up was satisfactorily. The self-confidence of the patient was improved with increased prosthesis compliance.

Discussion

It is a well-known fact that ectodermal dysplasia has a variety of oral manifestations. They include mainly hypodontia, oligodontia, and severe ridge defects⁵. The most commonly seen defect is Seibert class III. They have severe tissue deficiency and knife edge ridges. Neither fixed nor removable prosthesis provide optimal results in ectodermal dysplasia patients. Considering the complications of implant surgery, implant supported prosthesis are also not preferred. Fixed-removable prosthesis is a comprehensive management technique for rehabilitation of such defects.

The fixed-removable prosthesis had several advantages over implant supported prosthesis⁶. It permits adequate oral hygiene maintenance and provides pleasing esthetics. They take support from natural tooth which eliminates the need of surgery for implants. The length and extent of bar is dependent on the length and width of the edentulous span. 2mm clearance is given between the ridge and the bar to facilitate oral hygiene⁷. The bar was fabricated along with retainers and attachments as a single unit.

The attachments were made by using “tich buttons” which are easily available and economical. The matrix part of attachment is made up of stainless steel. These attachments had a precise fit. They are also resistant to chemical and stress corrosion which allows the patient to insert and remove the removable component many times without its wear and tear. This increases the durability and longevity of the prosthesis.

After the prosthesis had been used for a period of time, retention may decrease as result of wear of matrix component of attachment, in which case the matrix can be easily replaced.

The ridge in ectodermal dysplasia patients resorbs with time⁸. The RPD can be relined in the future as the tissue surface was made in acrylic. The fixed-removable prosthesis is more stable and retentive because of both of its removable and fixed component.

Clinical Significance

Customized ball attachments fabricated using “tich buttons” is simple and cost effective method as compared to pre-fabricated attachments. Fixed-removable prosthesis offers a simple, user friendly and economic alternative to conventional FDP’s and complicated tissue surgical procedures in class III Seibert defects. The success lies in the fact that it is stabilized and supported entirely by the bar.

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Legends Figure



Figure 1: Pre op frontal view showing class III Seibert defect.



Figure 2: Occlusal view after tooth preparation.

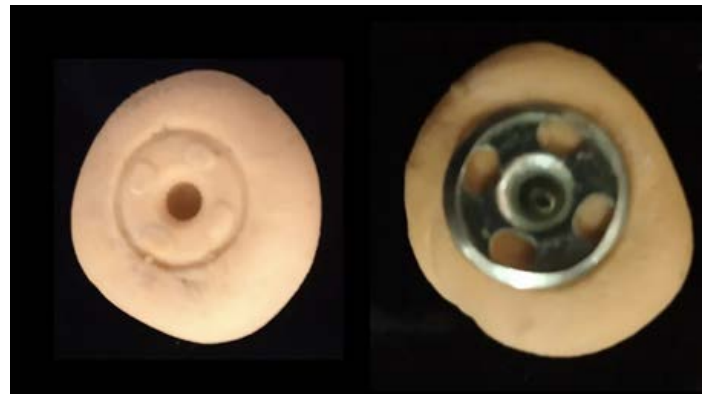


Figure 3: Putty index of matrix part of "Tich button"

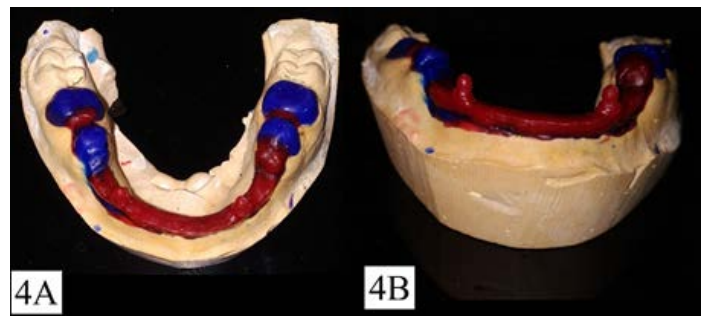


Figure 4: (A) Complete wax up occlusal view. (B) Complete wax up frontal view showing ball attachments.



Figure 5: Try in of metal framework



Figure 6: Cementation of PFM Crown along with bar.



Figure 7: Matrix attached to the bar



Figure 8: Matrix pick up in RPD.



Figure 9: (A) Pre op frontal view. (B) Post op frontal view



Figure 10: (A) Pre op extra-oral view. (B) Post op extra-oral view