Short Communication

Andrew's bridge system: A boon for huge ridge defect in aesthetic zone

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ABSTRACT

Tooth loss may pose a challenge for prosthetics when several missing teeth are associated with huge vertical and horizontal bone defects due to cleft palate, road traffic accidents, congenital defects etc.

This case report presents prosthetic rehabilitation of a 22 year old male patient of cleft lip and palate with missing upper front teeth along with severe ridge defect since 1 year due to surgical intervention in premaxillary region. The extensive soft and hard tissue defect in aesthetic region was evident and it made the prosthetic rehabilitation more challenging. Among treatment options, fixed partial denture (FPD) was not feasible due to long edentulous span and extensive soft and hard tissue loss. Psychologically, patient was not ready for removable prosthesis. Patient was also not ready for next implant or bone augmentation surgery procedure. The patient presented with Kennedy class IV edentulous area with Seibert's class III ridge defect, so fixed-removable prosthesis was planned to compensate soft and hard tissue defect. The patient with several missing teeth and extensive visible bony defect in the anterior region was successfully rehabilitated using fixed-removable Andrew's bridge system. Although it is not commonly used by dentist so this present case report shows effective management of huge defect case by very simple and conservative technique.

1. Introduction

Loss of teeth is one of the common sequelae of aging process. There are various causes of tooth loss including dental caries, periodontitis, trauma etc. Complete surgical replacement of the lost tissues is difficult and unpredictable, particularly when huge bone defect due to trauma, congenital defects or other pathologic process.

The prosthetic treatment options for a short span edentulous include:

1. Conventional fixed partial denture (FPD),
2. Implant supported FPDs,
3. Removable partial denture (RPD),
4. Fixed-removable partial denture.

The main difference between removable and fixed prosthesis is psychological impact, rest all factors can be restored such as function, comfort, phonetics and esthetics.¹ As patients prefer fixed prosthesis but it cannot provide favourable results in this case due to difficulty in maintaining hygiene, prosthesis weight, esthetics.² So in this case report we reinforce our treatment by using fixed-removable prosthesis which fulfills patient requirement.

In 1965, Dr. James Andrews introduced the fixed partial denture-

removable partial denture system.³ It consists of removable and fixed components where removable component includes acrylic teeth on acrylic denture base to which metal or plastic sleeve is embedded.³ The fixed component includes metallic bar which is casted onto two adjacent metal crowns of abutments.³

The indications for fixed-removable Andrews's bridge system are

- Several missing teeth along with defect in the ridge.
- Failure of removable partial denture because of discomfort related to its palatal extension;
- Long edentulous space where fixed partial denture has not succeed.
- Cleft palate patients.

The fixed-removable Andrew's bridge system is indicated in long edentulous regions where several missing teeth along with extensive ridge defect which cannot be rehabilitated by fixed prosthesis. This case report presents prosthetic rehabilitation of surgically repaired cleft lip and palate patient by fixed-removable Andrew's bridge system.

2. Case presentation

A 22 year old male patient reported the Department of Prosthodontics, Faculty of Dental Sciences (FDS), Institute of Medical

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Fig. 1. Extraoral view before treatment.

Sciences (IMS), Banaras Hindu University (BHU) with a chief complaint of unpleasant appearance due to missing upper front teeth along with a visible huge ridge defect. Dental history revealed surgical intervention done for cleft lip and palate by removal of bony irregularity from premaxillary region along with anterior teeth extraction was done before 1 year ago in department of Oro-maxillofacial surgery, FDS, IMS, BHU.

Extraoral clinical examination revealed lip deformity showing incompetent lips, short lip length with reduced support (Fig. 1). Intraorally, there was visible soft and hard tissue defect in V-shaped narrow maxillary anterior alveolar ridge, which was not favourable for fixed prosthesis (Fig. 2). The radiographic examination revealed complete bone loss from right canine region to left premolar region of maxillary alveolar bone.

After clinical history and radiographic assessment, diagnostic impressions were made to fabricate the customized tray with proper extensions. The right canine and left premolar underwent tooth preparation by placing shoulder finish line buccally and chamfer finish line palatally (Fig. 2). Polyether rubber base impression material (3M ESPE Monophase, medium bodied consistency, 3M Deutschland Dental products, Germany) was used for final impression making to record the very fine detailing. The metal bar (chrome-cobalt alloy) was casted and soldered with PFM crowns to be cemented on both abutments. The metal trial was done to confirm the passive fit and complete seating of prosthesis (Fig. 3). Occlusion rim was fabricated over the edentulous area and teeth arrangement was done after matching size and shade properly. The removable part was heat cured separately. The characterization of prosthesis was done by adding pigments to simulate the melanin pigmented gingiva (Fig. 4). The fixed component was cemented onto the prepared abutment tooth and removable part was seated over the metal bar, occlusal adjustments were made and patient's approval was taken (Fig. 5). The patient was instructed to follow the cleanliness of prosthesis and underlying tissue similar to removable

Fig. 2. Intraoral view showing huge defect.

Fig. 3. Try-in for casted metal bar soldered with PFM crown (fixed components).

Fig. 4. Fixed and removable components of Andrew's Bridge system.

Fig. 5. Extraoral view after treatment.

denture like removal of prosthesis and keeping it in disinfectant solution overnight. The patient was kept on regular follow-up for every 6 months. The patient was satisfied with prosthetic outcomes.

3. Discussion

Andrew's fixed-removable system is a commendable alternative for treating the anterior ridge defects. The advantages of the conventional Andrew's system over the implant supported fixed partial dentures have been largely reported in the literature and textbooks.

Andrews' Bridge is in spite of being old treatment alternative, it is seldom used by clinician for the management of soft and hard tissue defect. According to Siebert's classification this defect is class III defect which commonly occurs due to cleft lip and palate which cannot be restored by fixed prosthesis because of short prognostic results in long

span edentulous area and high aesthetic demands in anterior region.⁴ Removable prosthesis is less efficient, function and reduced ability to taste food due to palatal extension and impingement may cause tissue soreness. One of the best solutions for rehabilitating Seibert's class III ridge defect is fixed-removable partial denture Andrew's bridge system.⁵ Andrew's bridge is modified fixed-removable prosthesis. The Andrew's system is usually of two types based on the area of bar attachment.

- Pontic supported Andrew's bar system.
- Bone anchored or implant supported Andrew's bar system.

The advantage of the Andrew's bridge system provides better aesthetics, hygiene and phonetics.

It is comfortable and economical which was important requirement for this patient.

There is no palatal extension as in the case of removable partial dentures so that patient was comfortable with his prosthesis. This type of prosthesis is more retentive and stable with minimal extension.

Compared to a FPD, the pontic teeth are arranged during the aesthetic try-in appointment. Replacement of the teeth along with an acrylic denture flange is an added advantage, as it does not require a separate prosthesis for the gingival defect as in the FPD.

Surgical correction of the defects using grafts like iliac crest with or without growth factor and placement of implants was an expensive and time taking procedure for this patient.⁶ Some authors suggested alloplast graft with collagen membrane provides good result in cleft alveolus.⁷ In this clinical situation, conventional removable prosthesis or fixed prosthesis was not a feasible option. Andrew's Bridge can prove successful in restoring function, esthetics, speech and closure of the defect.

This system has fixed and removable components where fixed type bar which is used for retention and stability and removable part which fulfills esthetics and functional demands.³ Two types of bars are used, for anterior -single bar and for posterior-twin bar.¹ The bar should be at least 2 mm in height for sufficient strength to support the removable portion of restoration.⁶ The removable component includes acrylic teeth on acrylic denture base. There are various treatment options to rehabilitate such kind of challenging cases like removable partial denture, cast partial denture, implant placement after bone augmentation etc.⁶ Removable partial denture and cast partial denture were ruled out because patient refused to use any removable prosthesis as patient was

young and having high aesthetic and functional demands. Patient has refused for implant placement because of increased morbidity due to surgical intervention, as presence of huge defect at surgical site may require autogenous graft like iliac crest which is associated with secondary site morbidity, multiple appointments and economical reasons.⁷

In previous literature, the limited cases were reported of Andrew bridge prosthesis failure. The reported case of failure was due to inadequate soldering.⁸ Probable disadvantage of this prosthesis are wearing of retentive sleeves leading to loss of stability and retention of prosthesis, frequent repair and relining may be required. The removable component of prosthesis require patients efforts for regular cleaning of prosthesis and underlying tissue which is sometimes cumbersome for patient.

4. Conclusion

Andrew's bridge is a good treatment modality for Seibert class III ridge defect. It can be a boon for patients who do not prefer implant surgery due to surgical intervention, economical reasons, long duration multiple appointments etc. This case report presents a technique which is simple, economical, provides better support, stability, retention, esthetics and few chair side procedure appointments.

Declaration of competing interest

There is no conflict of interest.

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