Case Report
Journal of Pierre Fauchard Academy (India Section), *Vol 36(1), DOI: 10.18311/jpfa/2022/28728, March 2022 p. 30-33*
ISSN (Print) : 0970-2199
ISSN (Online) : 2405-772X

Andrews Bridge Fixed Removable System: A Clinical Case Report

Vineet Sharma[1*], Jyoti Paliwal[2], Kamal Kumar Meena[3], Ramjee Lal Raigar[3] and Priyanka Yadav[1]

[1]Medical Officer (Dental), Department of Prosthodontics, Crown and Bridge, R.U.H.S. College of Dental Sciences, Jaipur – 302016, Rajasthan, India; vineetalwar007@gmail.com
[2]Professor and Head, Department of Prosthodontics, Crown and Bridge, R.U.H.S. College of Dental Sciences, Jaipur – 302016, Rajasthan, India
[3]Senior Demonstrator, Department of Prosthodontics, Crown and Bridge, R.U.H.S. College of Dental Sciences, Jaipur – 302016, Rajasthan, India

Abstract

The aesthetic zone presents a dilemma for prosthetic rehabilitation. Prosthetic restoration of significant alveolar bone loss in the aesthetic zone is often challenging. The Andrews Bridge fixed removable system can be used in such cases as it combines the benefits of a Fixed Partial Denture (FPD) with the aesthetics of a Removable Partial Denture (RPD) to restore lost teeth and gingiva while addressing the aesthetic challenge of significant alveolar bone loss. It reduces the denture bulk and provides good retention and patient comfort. There is no need for palatal or lingual flange covering, as in a regular RPD.

Keywords: Alveolar Bone Defect, Andrews Bridge, Fixed Dental Prosthesis. Fixed-Removable, Removable Partial Denture
(**Article chronicle:** **Received:** 01-10-2021; **Revised:** 15-01-2022; **Accepted:** 28-02-2022)

1. Introduction

Prosthetic replacement becomes more challenging when a significant portion of the alveolar ridge and anterior teeth are removed owing to surgery or periodontal bone loss[1,2]. This problem can be addressed in three ways. The first one is an FPD with large pontics, interproximal space and compromised lip fullness. The second one is an RPD with an aesthetically acceptable pontic area but with unesthetic anterior clasping. Also, with the labial flange, it provides adequate lip fullness. The third one is the Andrews Bridge, a fixed-removable dental prosthesis[3]. In 1976, James Andrews introduced the Andrews bridge[4]. The fixed portion is comprised of porcelain fused to metal crowns, which are attached together with a prefabricated bar and luted to the prepared teeth, while the removable portion is comprised of a corresponding sleeve embedded inside the RPD. The Andrews Bridge fixed removable system combines the benefits of FPD with the aesthetics of RPD to restore lost teeth and gingiva while addressing the aesthetic challenge of significant alveolar bone loss[5–7].

This case report describes a modification to the conventional Andrews Bridge for the replacement of anterior teeth lost due to trauma. Instead of using a sleeve over the prefabricated bar, a ball attachment with an O ring connected to the customised waxed-up bar was used.

2. Case Report

A 33-year-old female patient presented to the Prosthodontics Department at RUHS College of Dental Sciences in Jaipur with the chief complaint of missing anterior teeth. The previous history reveals the extrusion of anterior teeth following a road traffic accident 3 years ago. Past dental history reveals that the patient was wearing an RPD for one year. Intraoral examination revealed missing 22 and 63 with a Siebert class 3 defect showing both horizontal and vertical bone loss (Figures 1A, 1B)[8]. There was canine protected occlusion on both sides. Based on the clinical findings, the Andrews Bridge fixed-removable denture prosthesis was planned for the patient.

**Author for correspondence*

2.1 Clinical Procedure

To support the Andrews Bridge fixed removable system, 21 and 23 were selected as abutments. Diagnostic impressions of the maxillary and mandibular arch were made with irreversible hydrocolloid impression material (Zelgan; Dentsply, New Delhi, India) and poured with Type III dental stone (Kalstone; Kalabhai Karson Private Limited, Mumbai, India). A diagnostic mockup was done to aid in abutment preparation and temporization (Figures 2A, 2B). The abutment teeth, 21 and 23, were prepared for PFM crowns. An elastomeric impression was made with polyvinylsiloxane using the putty wash technique. A tooth-colored self-cured acrylic resin provisional restoration was fabricated and luted to the prepared abutment teeth. The PFM retainers were waxed up (Figure 2C) and connected by a customized plastic bar with a ball attachment. Once the whole pattern had been cast in the chrome-cobalt alloy, a try-in was done to check for esthetic, phonetic, and functional parameters (Figure 2D). Shade matching of ceramic restorations with acrylic denture teeth was done by selecting the shade of the abutment teeth. Porcelain was then added to PFM retainers and the glaze was applied. An impression was made after provisionally cementing the framework to the abutment teeth (Figure 2E). An acrylic resin heat-cured trial denture was processed and polished and a try-in was done over the fixed element of the Andrews Bridge fixed removable system. The undercut was then blocked out with wax under the bar attachment. An O ring was placed over the ball attachment and picked up in self-curing acrylic resin in the RPD. The denture was removed, cleaned, and polished, then checked for aesthetics, phonetics, and function (Figures 1C, 1D). During the treatment process, the patient was trained to insert and remove the Andrews Bridge prosthesis. Periodic recalls were emphasized to determine the success of the treatment.



Figure 1. A. Extraoral, B. Intraoral pre-Operative with Siebert Class III defect; C. Post-treatment aesthetic outcome on extra-oral view, D. Andrews Bridge in Situ.



Figure 2. **A.** Diagnostic Mock-up; **B.** Provisionalization; **C.** Wax-up of coping; **D.** Framework Try in; **E.** Provisional cementation of framework to abutment teeth before pick-up impression for acrylization of alveolar defect.

3. Discussion

Prosthetic restoration of significant alveolar bone loss in the aesthetic zone is often challenging[6,7]. Siebert classified alveolar bone defects into Class I, Class II and Class III[8–10]. These can help determine a prognosis and identify specific technical challenges. Class I includes loss of horizontal bone without loss of vertical bone. Class II includes loss of vertical bone without loss of horizontal bone. Class III includes both vertical and horizontal bone loss. The patient treated in the present case was a Siebert's Class III with both vertical and horizontal bone loss. The patient was advised about four possible treatment options, including a conventional RPD, a conventional FPD, implant placement with bone grafting and the Andrews Bridge fixed-removable denture prosthesis[5,6]. An RPD had already been worn by the patient. The patient did not want to remove and replace the denture; therefore, she needed a fixed prosthesis. As the patient needed both a bone defect to be fixed and teeth to be replaced, conventional FPD was likewise ruled out. In this case, the patient was hesitant to undergo surgical implant placement with bone grafting. Finally, the Andrews Bridge fixed removable system was selected because it included both removable and fixed options, making it more advantageous than the other choices[11].

4. Conclusion

In cases where conventional treatment is ineffective, Andrew's bridge can be used to rehabilitate congenital and acquired defects. Fixated-removable prostheses provide a natural appearance and optimal speech by replacing missing teeth and covering the defect completely. Therefore, the Andrews Bridge fixed removable system combines the benefits of both the FPD and RPD and is recommended in situations where the alveolar bone has severe defects and abutments that can support a fixed dental prosthesis.

5. References

1. Pietrokovski J and Massler M. Alveolar ridge resorption following tooth extraction. *J Prosthet Dent.* 1967; 17:21–7. https://doi.org/10.1016/0022-3913(67)90046-7
2. Johnson K. A study of the dimensional changes occurring in the maxilla following tooth extraction. *Aust Dent J.* 1969; 14:241–4. PMid:5259350. https://doi.org/10.1111/j.1834-7819.1969.tb02290.x https://doi.org/10.1111/j.1834-7819.1969.tb06001.x
3. Gardner MF and Stankewitz CG. Using removable gingival facades with Fixed Partial Dentures. *J Prosthet Dent.* 1982; 47:262–4. https://doi.org/10.1016/0022-3913(82)90153-6
4. Andrews JA. The Andrew Bridge: A Clinical Guide. Covington, La., The Institute of Cosmetic Dentistry, 1976. p. 1–99.

5. Everhart RJ and Cavazos E. Evaluation of a fixed Removable Partial Denture: Andrews bridge system. *J Prosthet Dent.* 1983; 50:180–4. https://doi.org/10.1016/0022-3913(83)90008-2
6. Mueninghoff LA and Johnson MH. Fixed- Removable Partial Denture. *J Prosth Den*. 1982; 5:547–9. https://doi.org/10.1016/0022-3913(82)90360-2
7. Cheatham JL, Newland JR, Radentz WH and O'Brien R. The 'fixed' Removable Partial Denture: Report of case 1984; 109:57–9. PMid: 6379018. https://doi.org/10.14219/jada.archive.1984.0256
8. Seibert JS. Reconstruction of deformed partially edentulous ridges using full thickness onlay grafts: Part I. Technique and wound healing. *Compend Contin Educ Dent.* 1983; 4:437–53.
9. Seibert JS and Cohen DW. Periodontal considerations in preparation for fixed and removable prosthodontics. *Dent Clin North Am.* 1987; 31:529–55. https://doi.org/10.1016/S0011-8532(22)02086-9
10. Seibert JS. Reconstruction of deformed, partially edentulous ridges, using full thickness onlay grafts. Part I. Technique and wound healing. *Compend Contin Educ Dent.* 1983; 4:437–53.
11. Andrews JA and Biggs WF. The Andrews Bar-and sleeve-Retained Bridge: A clinical report. *Dentistry Today*. 1999; 18:94–6. https://doi.org/10.1109/MC.1985.1662871