

Prosthetic Replacement of Severely Compromised Partially Edentulous Arch - A Case Report

Abu Nazar N¹, Suja Joseph², Shibi Mathew³, Nazia Rasheed⁴

ABSTRACT

Introduction: Tooth loss results in the subsequent loss of the adjacent alveolar process and the soft tissues around it. Complete esthetic surgical replacement of the lost tissues is difficult and unpredictable, particularly when a greater degree of the residual ridge has been lost due to periodontitis, trauma, congenital defects or other pathologic process. There comes the role of Andrews Bridge which is a fixed removable prosthesis.

Case report: A 58 year old gentleman came to the department of prosthodontics with the chief complaint of missing teeth in the lower front region, associated with Loss of hard and soft tissue in the anterior residual ridge area due to periodontitis since 4 years.

Conclusion: When treating patients with congenital or acquired defects, the Andrews Bridge permits rehabilitation with a fixed-removable partial denture when conventional methods are contraindicated.

Key words: Andrews Bridge, Fixed Removable Prosthesis, Seibert's Class III Defect

INTRODUCTION

Loss of teeth is one of the natural sequelae of aging process. The various causes of tooth loss are caries, periodontitis, trauma and extraction as a part of surgical excision of tumors.¹ Tooth loss results in the subsequent loss of the adjacent alveolar process and the soft tissues around it. Complete esthetic surgical replacement of the lost tissues is difficult and unpredictable, particularly when a greater degree of the residual ridge has been lost due to periodontitis, trauma, congenital defects or other pathologic process. In spite of using grafts it is difficult to restore the lost vertical ridge height. There comes role of a fixed-removable partial denture.

Andrew's Bridge was introduced by Dr. James Andrews in 1966. It consists of a fixed retainer and removable pontics. The fixed-removable partial denture has a pontic assembly that can be removed for maintenance.²

CASE REPORT

A 58 year old gentleman came to the department of prosthodontics with the chief complaint of missing teeth in the lower front region. While recording the case history it has been found that, he had missing lower central and lateral incisors, associated with Loss of hard and soft tissue in the anterior residual ridge area due to periodontitis since 4 years [Figure 1].

Patient is asked to take an OPG to get the better view of hard tissue support of the dentition adjacent to the edentulous

space. OPG shows residual ridge defect horizontally and vertically in anterior edentulous region and it comes under Siebert's class 3 anterior ridge defect. Angular bone loss is seen with 33 and 43 and they were RCT treated [Figure 2]. Based on the diagnostic findings, a fixed removable partial denture was planned. The whole procedure along with advantages and disadvantages was explained to the patient, and informed consent was taken.

The step by step procedure involves Oral prophylaxis, Tooth preparation, Impression making, Temporization, Metal try-in, Rpd try-in and Prosthetic insertion

1. The procedures starts with tooth preparation on 33 and 43. As the bone height is comparatively less for canines/abutments crown root ratio was altered [Figure 3].
2. Impression is made with addition silicone (heavy and light body-Flexceed-GC) after the tooth preparation.
3. Impression is poured with die stone and wax pattern is made with inlay wax [Figure 4].
4. Casting of framework (Co-Cr) is done and patient is recalled for metal try in. The fit of the prosthesis verified in cast as well as intraorally [Figure 5].
5. Pickup impression of the lower arch is made with addition silicone. Then cast is poured and metal frame work is fabricated with a plastic sleeve for the acrylic RPD. The metal framework was tried to check for the proximal, marginal and occlusal relationship, esthetics, phonetics and proper hygienic access of the area [figure 6,7].
6. Shade selection for the ceramic (VITA Linear guide 3D-MASTER) and acrylic teeth (A2 Shade, Acry Rock, Ruthinium® Group, New Delhi, India) were selected according to patient's age, sex, and personality. Ceramic firing was done on the copings and teeth arrangement for the cast partial [Co-Cr] removable component was done which is followed by bisque trial to check the occlusion and esthetics and lip fullness [Figure 8, 9].

After the try in procedure and full filling the patient's requirements, the final glazing of the fixed component (facing ceramic) and acrylization of the cast partial reinforced

¹PG Student, ²Professor, ³PG Student, ⁴PG Student, Pushpagiri College of Dental Sciences, Perumthuruthy, Thiruvalla, Kerala 689107, India

Corresponding author: Dr Abu Nazar N, Pushpagiri College of Dental Sciences, Perumthuruthy, Thiruvalla, Kerala 689107, India

How to cite this article: Abu Nazar N, Suja Joseph, Shibi Mathew, Nazia Rasheed. Prosthetic replacement of severely compromised partially edentulous arch - a case report. International Journal of Contemporary Medical Research 2018;5(3):C11-C14.



Figure-1: Intra-oral view of the defect



Figure-2: preoperative OPG



Figure-3: Tooth preparation



Figure-4: wax pattern



Figure-5: framework trial

removable component was done [Figure – 8]. Then the fixed component was luted with Type I glass ionomer cement (GC Corporation Tokyo japan). After the final set of luting cement, the removable prosthesis was



Figure-6: Bisque trial; **Figure-7:** RPD trial



Figure-8: Work up



Figure-9: Preoperative; postoperative



Figure-10: Preoperative; postoperative

inserted, and the patient was taught to insert and remove the denture, and oral hygiene instructions were given [Figure 9].



Figure-11: Mock wax up for the fixed conventional prosthesis

Post insertion instructions and adjustments

1. Removable components should be separated and cleaned using brush. The fixed retainer can be cleaned with interdental brush and floss
2. The removable component should be kept in diluted chlorhexidine solution before going to sleep and should be cleaned before and after use.
3. Make the patient aware about the changing of retentive plastic sleeve over a period of time as the retentive ability decreases due to wearing and tear of sleeve.
4. Selective trimming on removable prosthesis should be done if its lingual or buccal flange is impinging on the underlying tissue.

DISCUSSION

Prosthetic rehabilitation of anterior ridge defect with soft tissue loss around it requires replacement of function, form and aesthetics. High incidence of ridge deformity is seen following loss of anterior teeth which is multifactorial³ and varies from location to location, in shape and severity. Classification of defects in the anterior ridge helps in determine the fabrication of definite prosthesis and its prognosis

Defects commonly found in the anterior ridge are classified and described by Seibert⁴ as

Class I defects-Labiolingual loss of tissue width with normal ridge height

Class II defects-Loss of ridge height with normal ridge width

Class III defects-A combination of loss in both dimensions

The reduced bone volume can result in altered facial features and reduced lip support⁵. Even though the reduction in bone width can be successfully regained to a certain extent, the lost bone height is nearly impossible to regain with the graft materials currently available in the market. Moreover, the main aim of any dentist should be the preservation of remaining tooth structure as stated by De Van⁶. Therefore, careful examination of the ridge defect and appropriate treatment plan should be decided before attempting to restore such defects. In this case as the ridge defect was Siebert Class III condition, and this is most prevalent and difficult to rehabilitate it must be restored both horizontally and vertically.⁷

Prosthetic replacement of seibert's classIII with conventional fixed dental prosthesis often resulting in long pontic with over contoured and unaesthetic restorations. Conventional fixed dental prosthesis can restore the lost teeth but failed to replace the lost soft tissue underlying the prosthesis, because it is a pure tooth born prosthesis.⁸

The above figure shows the diagnostic mock wax up of the conventional fixed prosthesis of the same case. It's clear from the wax up model that if the clinician had opted for a fixed 6 unit bridge over a fixed removable Andrews bridge it would have created a unaesthetic prosthetic replacement. Also the patients finds it very difficult to clean the area below the restoration leads to plaque accumulation and early failure of the prosthesis.

A minimum of 3–4 mm occlusogingival height is necessary for proper functioning of Andrew's bridge.⁹ A minimum of 2 mm vertical bar height and an occlusal clearance of about 1.5 mm is required for sufficient strength to support the removable portion of the restoration.¹⁰

Indications

- Patient with partial edentulousness associated with loss of soft tissue and hard tissue.
- Patient with reduced lip support and fullness due to long term edentulousness that can't be corrected with a fixed conventional fixed prosthesis alone
- Patient undergone invasive oral surgeries associated with the removal of hard tissue and considerable amount of soft tissue.
- Cleft palate patients
- Patient with low economic background who cannot afford an implant supported prosthesis

Among the various treatment concepts discussed for the seibert's class III ridge defect like cast partial denture, fixed removal prosthesis, conventional fixed dental prosthesis, ridge augmentation with bone graft followed by implant placement, the fixed removable partial denture (Andrews Bridge) is selected as the treatment plan for the patient as it is considered best for the patient to restore his smile and confidence thereby satisfies his chief complaint. Also the clinician requires less time to deliver the prosthesis and fewer appointments are needed when it is compared with other treatment concepts. Also the patient oral hygiene maintenance is improved as the removable prosthesis can be cleaned separately which makes Andrew's bar system more acceptable.

Advantages

- Andrew's bridge prosthesis reestablish esthetics and phonetics in cases involving huge soft tissue loss
- Patient get access to maintain the hygiene around the abutments effectively
- The removable prosthesis can be relined with new retentive plastic sleeve as the ridge resorbs.
- The extension of removable part towards the palate in maxilla or towards distolingually in mandible can be restricted since the prosthesis retained by bar retainer
- Andrews's system is more stable and retentive than cast partial dentures.
- Andrew's Bridge has been adapted to implant prosthesis very well.

Disadvantages

- Lack of proper hygiene maintenance from the patient can lead to loss of abutments on which the retainers are

fixed.

- Lack of adequate space between the retainer bar and underlying tissues can lead to food accumulation and gingival inflammation.
- As time progresses the retentive ability of plastic sleeve embedded in the metal base of removable component decreases which has to be replaced with the new one
- As the removable component is small, chances of swallowing the prosthesis is more

CONCLUSION

Among the different treatment concepts to rehabilitate a seibert's class III situation, Andrews Bridge is the best option considering its low cost and less treatment time. This prosthesis replaces both hard and soft tissue defect to regain the form and function. It also permits the patient to practice better oral hygiene maintenance around the abutments.

REFERENCES

1. Gubrellay P, Gubrellay P, Vyas R. Andrews bridge system – A literature review. *Int J Res Dent* 2014;4:59-62.
2. Andrews, J. A.: The Andrew Bridge: A Clinical Guide. Covington, La., 1976, the Institute of Cosmetic Dentistry, pp 1-99.
3. Abrams H, Kopczyk RA, Kaplan AL. Incidence of anterior ridge deformities in partially edentulous patients. *J Prosthet Dent* 1987; 57:191-4.
4. 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.
5. Muthuvignesh J, Bhuminathan S, Egammai S, Narayana DR. Improving facial esthetics with an Andrew's bridge: A clinical report. *Indian J Multidiscipl Dent* 2013;4:884-7.
6. DeVan MM. Basic principles of impression making. *J Prosthet Dent* 1952;2:26-35.
7. Seibert JS. Reconstruction of deformed, partially edentulous ridges, using full thickness onlay grafts. Part II. Prosthetic/periodontal interrelationships. *Compend Contin Educ Dent* 1983; 4:549-62.
8. Mueninghoff KA, Johnson MH. Fixed-removable partial denture. *J Prosthet Dent* 1982;48:547-50.
9. Christenson GJ, Guyer SE, Lefkowitz W, Malone WF, Sproull RC. Evaluation of a fixed removable partial denture: Andrewbridgesystem. *J Prosthet Dent* 1983;50:180-4.
10. Kantorowicz GF, Howe LC, Shortall AC, Shovelton DS. Inlays, Crowns and bridges: A clinical handbook. 5th ed. Oxford: Butterworth Heinemann; 1993.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 03-03-2018; **Accepted:** 04-04-2018; **Published:** 13-04-2018