

Restoring Anterior Aesthetics with the Andrew's Type Bridge: A Case Report from Nigeria

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ABSTRACT

Objective: Grossly resorbed anterior edentulous cases especially in a conservative and financially constrained patient present an aesthetic challenge to the rehabilitating dentist. This challenge can be overcome by the use of the Andrew's Bridge. The construction of this prosthesis requires pre-fabricated components which may not be readily available in Nigeria. However, design modifications may produce satisfactory outcomes with this mode of treatment.

Case Report: A 24 year old man presented with a 14 year history of missing anterior teeth in the maxilla and mandible following a road traffic accident. The maxillary edentulous area was rehabilitated with an Andrew's type bridge whose removable component gained retention from round wire retainers on abutment teeth. The mandibular edentulous area was rehabilitated with an acrylic denture.

Conclusion: The Andrews Bridge is a viable option for rehabilitating grossly resorbed ridges in Nigeria. Design modifications may overcome some of the infrastructural challenges that may be faced in its fabrication.

Keywords: Anterior aesthetics, Fixed-Removable, Andrew's Bridge

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INTRODUCTION

The grossly and irregularly resorbed anterior maxillary edentulous ridge presents a challenge to the dentist seeking to fabricate a prosthesis for its

rehabilitation.¹ The use of conventional fixed prosthesis may prove unaesthetic as the pontics may appear excessively long.² There may be the challenge of satisfying Ante's law without producing complex

fixed partial dentures when all the incisors are lost.³The use of implants in these cases usually requires some form of bone augmentation.⁴The financial burden of dental implants may also be too much for many patients to bear.

The use of removable partial dentures in these cases may also prove difficult. The considerable loss of tissue may eliminate the possibility of the provision of a labial flange. This would adversely affect the stability and retention of such a prosthesis.⁵The irregular nature of such ridges also provide suboptimal support for such a denture.⁶ Thus even for a removable denture, such ridges may require pre-prosthetic surgery to facilitate the function of such prosthesis. An unstable and ill retentive prosthesis is often a health challenge to the individual wearing such a prosthesis.⁶

The problems associated with these grossly resorbed anterior ridges have been ameliorated by combining the desirable qualities of fixed and removable prosthesis. The superior aesthetics possible with removable flanged acrylic dentures, have been combined with the tooth support that can be obtained by the use of a fixed prosthesis with a bar connecting the abutment teeth as a retainer for the removable denture. This fixed component will also effectively increase the height of the ridge and permit the use of a labial flange. This labial flange will in turn help with the stability and retention of the removable prosthesis. These kinds of prostheses are sometimes called fixed-removable prostheses.⁷

The original design and fabrication of these fixed removable prostheses is credited to an American dentist James Andrews who documented his methods in 1976.^{8,9}These prosthesis are commonly called the Andrew's Bridge System. The fixed prosthesis component consists of a bar attached at both of its free ends to a porcelain fused to metal full coverage crown that will be placed on each of the abutments of the edentulous space. The removable component is an acrylic partial denture with a sleeve within the denture base that clicks unto this bar for retention.

CASE REPORT

A 24 year old male presented at the prosthodontic clinic of the Aminu Kano Teaching Hospital, Kano State, Nigeria; with a 14 year history of missing anterior teeth following blunt trauma to the mouth from motor traffic accident when he was still a teenager. There was no history of previous prosthesis

use. On examination, he was found to have an upper lip scar and missing 13, 12, 11, 21 and 22 with grossly resorbed ridge and areas of loss of basal bone. The upper edentulous ridge corresponded to Cawood and Howell's class VI edentulous ridge.¹⁰He also had the 31 and 32 missing in the lower quadrant. However, the lower edentulous ridge corresponded to a Cawood and Howell class III with moderate resorption. The standing teeth in the mouth were of good periodontal and pulpal status.

The patient could not afford the cost of implant placement and bone augmentation. He refused pre-prosthetic surgery to re-contour the upper edentulous ridge, but consented to minimal tooth preparation of the teeth that formed abutments for the upper edentulous area. He also declined treatment with metal framework partials due to cost considerations. He was therefore planned for a lower acrylic denture as an interim treatment in view of the better ridge quality and his financial wherewithal. The upper edentulous ridge was planned for definitive rehabilitation with an Andrew's type bridge. Andrew's type bridge was not considered an option for the mandibular edentulous space due to the short clinical crowns of lower anterior teeth, the fact that the edentulous ridge was only moderately resorbed and the financial wherewithal and desires of the patient.

The patient had a scale and polish to optimize oral hygiene. The 14 and 23 were prepared for jacket crowns. The 14 for an all metal crown and the 23 for a porcelain fused to metal preparation. Impressions were made in addition silicone and poured in type III gypsum. The patient was discharged with acrylic temporary crowns on the prepared teeth. The prepared teeth on the cast were waxed up for the jacket crowns and joined horizontally by the wax pattern for a bar. The wax work was cast in Nickel-Chromium and the crown on 23 had a labial porcelain facing fired unto it.

The framework was tried in the mouth and was found satisfactory. The space between the bar and tissues was blocked out with wax intraorally and an alginate impression made. The cast obtained from this impression was used for the fabrication of the acrylic denture component of the prosthesis. Round wire of 0.7mm gauge was used to reinforce the area of acrylic that would come in contact with the bar. Round wire retainers were also placed on the abutment teeth to ensure retention. The acrylic denture was fabricated in self-curing resin which had

supplementary polymerization in a pressure bath. An acrylic denture was made in the usual manner for the lower edentulous space.

The acrylic dentures were finished and delivered to the patient. The lower denture was delivered in the usual manner, while the upper denture was worn over the framework which had earlier been cemented in place with Glass Ionomer Luting Cement (Fuji I). The patient was given post-delivery instructions. The patient had a recall visit after 24 hours, 3 days and every month for three months after delivery. He was placed on 3 monthly prophylactic scale and polish. There has not been any adverse finding after three months of post-delivery follow up. The stages of the treatment are presented pictorially in Figures 1 to 8.



Fig 1: Intra-oral view of patient before treatment



Fig 2: Intra-oral view of patient with provisional restorations (tooth-coloured acrylic) on 14 and 23 after preparation



Fig 3: Stone models of intra-oral view



Fig 4: Wax pattern of framework for fixed component



Fig 5: Buildup of removable component in self-curing acrylic. Note wires seen through the acrylic palatally.



Fig 6: Fixed and removable components placed beside each other on a tray.



Fig 7: Fixed component cemented in place



Fig 8: patient with upper and lower prostheses in place

DISCUSSION

The clinician in the developing world is often faced with challenges occasioned by the level of infrastructural development in general, and the economic capacity of the patient to access the normative standard of care. These challenges often force the clinician and his laboratory to develop creative treatment protocols that will deliver comparative results to the standard treatments that are available. These creative treatment protocols deserve documentation as they may serve as guides to other clinicians in similar situations.

Dental implants with bone augmentation have been documented to have a predictable success rate and to be cost efficient in the long term. However, in many developing countries, the cost of accessing this treatment may prove prohibitive. These treatments are also not captured in the health insurance schemes of such countries.

The use of conventional fixed prosthesis in cases like that presented is to be discouraged. These prostheses are contraindicated mainly for the poor aesthetic results they often produce. They may also present the laboratory with unnecessary difficulty in an attempt to compensate for some of these aesthetic challenges. The edentulous ridges are usually of a non-uniform contour which would make placement of the pontics a challenge in this situation. The emergence profile of the artificial teeth will also present a challenge to the technologist.

The Andrew's Bridge system has been used to produce aesthetic and functional results in cases such as that presented in this report. The system gains retention for the removable component from the close adaptation of the prefabricated bar and sleeve. Where these components cannot be purchased readily, a bar can be cast to two full coverage retainers on the abutments. The lack of close adaptation and hence retention of the removable components to this cast bar can be overcome with the use of round wire retainers of the abutment teeth. The area of the acrylic that will continually come in contact with the cast bar may be strengthened with wires as done in this case. The round wire retainers are reciprocated by the extension of the palatal plate of the denture to the fixed restorations on 14 and 23. The intervening bar will also assist in dissipating any forces generated by the round wire retainers. The edges of these retainers were blunted and kept in undercut areas to prevent trauma to oral soft tissues.

CONCLUSION

The Andrew's Bridge system is a viable noninvasive treatment option that involves provision of a tooth borne removable prosthesis to individuals with grossly and non-uniformly resorbed anterior maxillary edentulous ridges. In situations where the prefabricated bars and sleeves necessary for the fabrication of these prosthesis are unavailable, a customized bar may be cast along with the retainers of the fixed component in the laboratory. The removable component can be made retentive in spite of not locking unto the bar by the use of round wire retainers on the abutments.

Source of Support

Nil.

Conflict of Interest

None declared

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