CASE REPORT

Hader bar and clip attachment retained mandibular complete denture

Kunwarjeet Singh,¹ Nidhi Gupta,² Vikram Kapoor,¹ Ridhima Gupta¹

¹Department of Prosthodontics and Implant Dentistry, Institute of Dental Studies and Technologies, Ghaziabad, Uttar Pradesh, India

²Department of Pedodontics and Preventive Dentistry, Institute of Dental Studies and Technologies, Ghaziabad, Uttar Pradesh, India

Correspondence to

Dr Kunwarjeet Singh,
drkunwar@gmail.com

SUMMARY

Bar and clip attachments significantly improve the level of satisfaction of denture-wearing patients by enhancing the retention and stability of the prosthesis. These attachments have been most commonly used for connecting the prosthesis to implants, but they can be effectively used to retain tooth-supported prosthesis as well. The primary functions of bar attachments are splinting the abutments together, even distribution of forces to the abutments and supporting areas, guiding the prosthesis into place, improving the retention, stability, support and comfort of the patient. The primary requirement for the use of bar attachments is the availability of sufficient vertical and buccolingual space for the proper placement of the bar, sleeves, teeth arrangement and sufficient thickness of acrylic denture base to minimise incidence of denture fracture in the area of bar assembly.

BACKGROUND

The ultimate objective of prosthodontic management is to rehabilitate the patient to as nearly normal function as possible. The basic overdenture concept requires preservation of residual soft and hard tissues. The use of Hader bar¹ and clip attachments and adherence to basic principles of complete denture design, drastically improve the level of satisfaction of denture wearing patients by enhancing the retention and stability of the prosthesis thereby increasing the masticatory efficiency.

This case report describes a technique to fabricate the Hader bar and clip attachment retained mandibular complete denture clinically and to explain the advantages that the Hader bar and clip attachment retained mandibular complete denture has over conventional mandibular complete dentures as well as other attachment systems.

CASE PRESENTATION

A 52-year-old man reported to our dental centre for prosthetic evaluation. The patient had received maxillary and mandibular anterior fixed partial denture and both posterior arches were unrestored. He had difficulty in chewing food and aesthetics due to poor designing of fixed partial denture. He wanted a well-retained prosthesis with better chewing efficiency. After removal of fixed partial denture, clinical and radiographic examination revealed that maxillary and mandibular right and left canines and mandibular right premolar were present, with no periapical pathology. The teeth were periodontally sound with no mobility. Sufficient vertical space was present for the

Figure 1 Remaining maxillary and mandibular natural teeth.

placement of copings, bar and clip, denture base thickness and for the arrangement of teeth. Keeping in mind, the patient's desire and availability of sufficient vertical space, it was decided to fabricate a maxillary telescopic denture and a mandibular bar and clip retained complete denture.

TREATMENT

After taking into account all the aspects of the present case, it was decided to fabricate a Tooth and Bar retained and supported mandibular overdenture. On clinical and radiographic evaluation, the remaining abutment teeth (figure 1) were prepared to the desired height, which depends on the availability of the vertical space with tapered round end diamond rotary bur, with subgingival chamfer finish line (figure 2). The impression was made with putty (Aquasil soft putty/regular set, Dentsply, Germany) and light body (Aquasil LV, Dentsply, Germany) polyvinyl siloxane elastomeric impression material by double step putty wash technique and poured in die material to obtain the cast on

Figure 2 Widely placed mandibular canines and right first premolar prepared for the construction of bar and copings.

To cite: Singh K, Gupta N, Kapoor V, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-010401

Figure 3 Preci-Horix bar assembly (plastic bar, metal housing, yellow—retention clips, green—fabricating plastic riders and retention clip placement tool).

which a wax pattern of the copings was fabricated with blue inlay wax (Kemdent, UK; figure 3).

The distance between the two abutments was measured and marked on the Hader plastic bar (Preci—Horix, Alphadent NV, Belgium). The bar was cut to the desired length and attached to the wax pattern of the copings with blue inlay wax (figure 4), after adjusting the length and height of the bar. The height of the bar should be adjusted according to the availability of the vertical space. The bar should either be in passive contact with ridge or there should be 2–4 mm of space between the bar and underlying mucosa for maintaining proper oral hygiene.²

The bar and wax pattern of the copings were casted with base metal alloy (Bego Wirocast S, Bego, Germany) and the try in of the finished and polished cast bar assembly was done in the patient's mouth and the marginal fit of the copings and relationship of the bar with the underlying ridge was evaluated. After evaluation and required adjustments, the casted bar assembly was cemented with glass ionomer cement (Hy-bond Glasionomer CX, Shofu INC, Japan; figure 5).

After wax up, investing and dewaxing of trial dentures, the Preci-Horix plastic fabricating rider clips was placed on the bar on the master cast at the desired location (figure 6) and then Preci-Horix metal housings were placed over the fabricating rider clips. The under cuts of the retentive bar adjacent to the metal housings were blocked with dental stone and packing was done with heat cure acrylic resin (Lucitone 199 denture base material, Dentsply, Germany), the dentures were processed, finished and polished.

The fabricating plastic riders used for stabilisation of the metal housing during processing of denture were removed with the help of haemostat. The retention sleeves/clips were then placed in the metal housing with the help of a special seating

Figure 4 Plastic bar connected to the inlay wax coping patterns.

Figure 5 Casted bar and coping assembly cemented with glass ionomer cement.

tool supplied in the attachment kit (figures 7 and 8). There should be a snap when the clips are pushed into the position. The special shape of the metal housing provides secure retention of the clips while providing leeway space in the labiolingual direction to allow the clips/riders some flex during insertion or removal of the prosthesis. The final prosthesis was delivered to the patient (figure 9). The patient was scheduled for follow-up visits every 3 months and reported no symptoms during 3 years of follow-up.

OUTCOME AND FOLLOW-UP

The treatment of the patient in the current case report was performed with Tooth and Bar retained and supported mandibular overdenture. By saving the natural teeth and fabricating a precision bar attachment retained prosthesis, there was improvement in the level of satisfaction of the patient due to increased

Figure 6 Green fabricating riders for stabilisation of metal housing.

Figure 7 Retention clips placed in the metal housing with the help of handling tool.

Figure 8 The intaglio surface of the denture with retention clips in processed acrylic denture.

retention, stability and chewing efficiency of the mandibular Hader bar retained complete denture. Three-year follow-up of the patient shows great satisfaction by the patient after a few adjustments during the first 2 months of postinsertion of the prosthesis.

DISCUSSION

Bar and clip attachments present a reliable and simple solution to denture retention and stability problems by improving the level of satisfaction of patients wearing denture.^{3 4} Currently, most of these extracoronal attachments are commonly used for retaining and supporting implant prosthesis. Bar and clip attachments can be effectively used to retain and support a complete denture, when a bar is attached to periodontally sound abutments through metal copings. Two abutments, one in each quadrant must be present for bar attachments.

Hader bar can be used as a retainer for tooth as well as implant supported prostheses. The bar is available as prefabricated plastic patterns that are adapted on the master cast and then cast in the alloy of choice. It is the sleeve of the Hader bar system which sets it apart from the other as this is also produced in plastic. The sleeves of most of other bars are made of metal. The plastic sleeve can be easily replaced on chair side when their retention has slackened.

The bar should be positioned directly above the crest of the ridge. This position makes it easy to clean the bar and fabricate the prosthesis above the bar. If the bar is positioned lingual to the crest of the ridge, it will interfere with tongue space and its function and the patient's speech. If the bar is positioned labial

Figure 9 The completed overdenture with much improved retention and stability.

to the crest of the ridge, it will interfere with teeth arrangement and lip support which might affect the aesthetics.

One of the most important requirements for use of any bar attachment is the availability of sufficient vertical and buccolingual space which limits their applications in many instances. Space problems have been stressed for all types of bar retainer, and space is a particularly precious commodity in the lower anterior region. The vertical relationship of the bar to the alveolar ridge is very important. When sufficient vertical space is available, providing 2–4 mm or more space between the bar and mucosa will allow easy passage of saliva and food particles as well as oral hygiene aids. Unfortunately, there is seldom adequate space for this arrangement unless across a cleft palate or an area of gross resorption. So in majority of the patients, the bar needs to be placed in even/passive contact with the mucosa. Any compression of the mucosa by bar will result in hyperplasia of the mucosa. It is impossible to clean underneath the bar, so bar should either be removed or modified to solve the problem.

Hader bar system is more economic and easily available as compare with other bar attachments.⁵ The vertical height of the plastic Hader bar can be easily adjusted on the master cast before casting, depending on the availability of the vertical space. The retention plastic sleeves can be easily replaced if required. The retention sleeves should be placed in the area of greatest space available.

During the fabrication of bar attachment retained prosthesis, the basic principles of complete denture fabrication must take precedence over mechanical considerations of attachments. The main objective must be to gain support from the maximum possible area to reduce or minimise any displacing loads falling on the denture.

These attachments improve the chewing efficiency and comfort of the patient by reducing the forward sliding of the mandibular denture, maintain the occlusion and minimising the trauma of the underlying supporting tissues.^{6 7}

Learning points

- ▶ Conventional mandibular complete dentures have limited retention and stability, due to which it may result in reduced function and may have a psychological bearing on the patient's mind.
- ▶ Hader bar and clip attachment is more economic and easily available as compare with other bar attachments and it drastically improves the level of satisfaction of denture wearing patients by enhancing the retention and stability of the prosthesis thereby increasing the masticatory efficiency.

Contributors All the authors contributed in the writing and designing of the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Shafie HR. *Clinical and laboratory manual of implant overdentures*. Blackwell Munksgaard, 2007.
- 2 Jenkins G. *Precision attachments—a link to successful restorative treatment*. London: Quintessence Publishing Co, 1999.

- 3 Sadig WM. Special technique for attachment incorporation with an implant overdenture. *J Prosthet Dent* 2003;89:93–6.
- 4 Walton JN, MacEntee MI. Problems with prostheses on implants: a retrospective study. *J Prosthet Dent* 1994;71:283–8.
- 5 Pigozzo MN, Mesquita MF, Henriques GE, *et al.* The service life of implant-retained overdenture attachment systems. *J Prosthet Dent* 2009;102:74–80.
- 6 Botega DM, Mesquita MF, Henriques GE, *et al.* Retention force and fatigue strength of overdenture attachment systems. *J Oral Rehabil* 2004;31:884–9.
- 7 Daher T. A simple, predictable intraoral technique for retentive mechanism attachment of implant overdenture attachments. *J Prosthodont* 2003;12:202–5.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow