Tooth supported overdenture: Case report

Pham Nguyen Quan
Hong Bang International University, Vietnam

ABSTRACT

Objective: Preserving the natural tooth root in prosthetic treatment improves the support, retention and stability of the restoration. The concept of tooth supported overdenture with attachments is based on a reduction in the root/crown ratio and a combination of retention on a custom attachment to improve retention for the denture. The aim of this case report is to present the clinical steps to perform tooth supported overdenture with cast attachment in patients with large maxillary torus. Methods: A 60-year-old female patient came to the clinic because her old denture cannot be used due to loose abutment teeth. The patient has a large maxillary torus extending to the vibration line. The final treatment plan is to extract the hopeless loose teeth and use the remain maxillary roots to serve as abutment teeth for the new removable partial denture. The sequence of treatment after periodontal and endodontic treatments is preparation of post space, taking impression and cast post with attached male part. The steps of fabricating removable dentures are performed simultanously with the post fabrication to save time for the patient. Female part of the attachment (Kugel hook) is mounted on the male part of the post and clinical pick up of attachment dental is performed chairside using to the self curing dental acrylic. Conclusion: The incorporation of attachment into the tooth supported overdenture improves the support, retention and stability of the restoration and slows down the bone resorption process. This is one of the goals of preventive prosthodontics.

Keywords: *tooth supported overdenture, attachment, removable denture*

1. INTRODUCTION

Preserving natural roots for overdenture treatment is basically to improve support, retention and stability of the prosthesis.[1,2] This is a treatment option for patients with low income who can't afford implant supported prosthesis and also should be considered a preferred alternative to complete dentures, especially in patients with insufficient alveolar bone support. Prosthodontics, endodontics and periodontics make possible to preserve roots of affected teeth by caries and periodontal disease. The concept of root retained overdentures with castable overdenture attachments is based on the reduction of the coronal surface of the tooth to the gingival level and the incorporation of radicular stud overdenture attachments to improve retention of the prosthesis [2 - 4]. An important aspect is the need of recall regimens and proper patient instruction in oral health to avoid abutment failure.

Overdenture was indicated in the following situations [1 - 4]:

- When patient presents with 4 or less retainable teeth.
- Stability and retention of conventional dentures will be a problem.
- As a practical measure in preventive dentistry.
- Lost of teeth in one arch while the other is dentulous or partially dentulous.

Corresponding author: Dr. Pham Nguyen Quan
Email: quanpn@hiu.vn

- Patients with unfavorable tongue positions and muscle attachments.

Advantages of overdenture treatment [1 - 4]:

- Improved support, retention and stability of the prosthesis.
- Propioception is maintained.
- Alveolar bone in the area of retained roots may be preserved from resorption.
- Alternative treatment option in patients with insufficient alveolar bone support.

2. AIMS

The aim of this case report is to present the clinical steps to perform tooth supported overdenture with cast attachment in patients with large maxillary torus.

3. CASE DETAILS

A 60-year-old female patient came to Nhan Tam Dental Clinic to make new denture because her old one cannot be used due to loose of abutment teeth. She requested a new denture not to cover the maxillary torus to gain maximum comfort. Patient had good oral hygiene, co-operative attitude and motivation. Medical history showed good general health. Oral examination revealed healthy oral mucosa, normal jaw movements, no TMJ disorder, acceptable jaw relations, and availability of adequate denture space.

Her old removable partial denture used tooth number 17, 23, 26 as abutment teeth. This denture could not be used due to the loss of tooth 26 and broken tooth 23. Intraoral examination revealed a large maxillary torus extended to the vibration line and the presence of following permanent teeth: 17, broken tooth 23 and remaining root of tooth 26. Grade 1 mobility of tooth 23, periapical lesion of tooth 23 and 26 were noted. Orthopantomogram and cone beam CT confirmed the above findings.

Figure 1. Panorex showed the initial situation

An interdisciplinary approach was necessary to evaluate, diagnose, and resolve oral problems using a combination of periodontic, endodontic and prosthodontic treatment. When patient treatment required a comprehensive approach, communication among the disciplines is critical in achieving aesthetic and function.

The final treatment plan was to extract the hopeless teeth (tooth 26) and use the remain maxillary tooth

(tooth 17) and root (tooth 23) to serve as abutment teeth for the new maxillary overdenture. Design of new overdenture was Kugel hook attachment (Yamahachi Dental Co., Japan) on root 23 and wrought wire retentive clasp on tooth 17.

Firstly, tooth 26 was extracted and root canal treatment of tooth 23 was performed simultaneously with dental scaling.

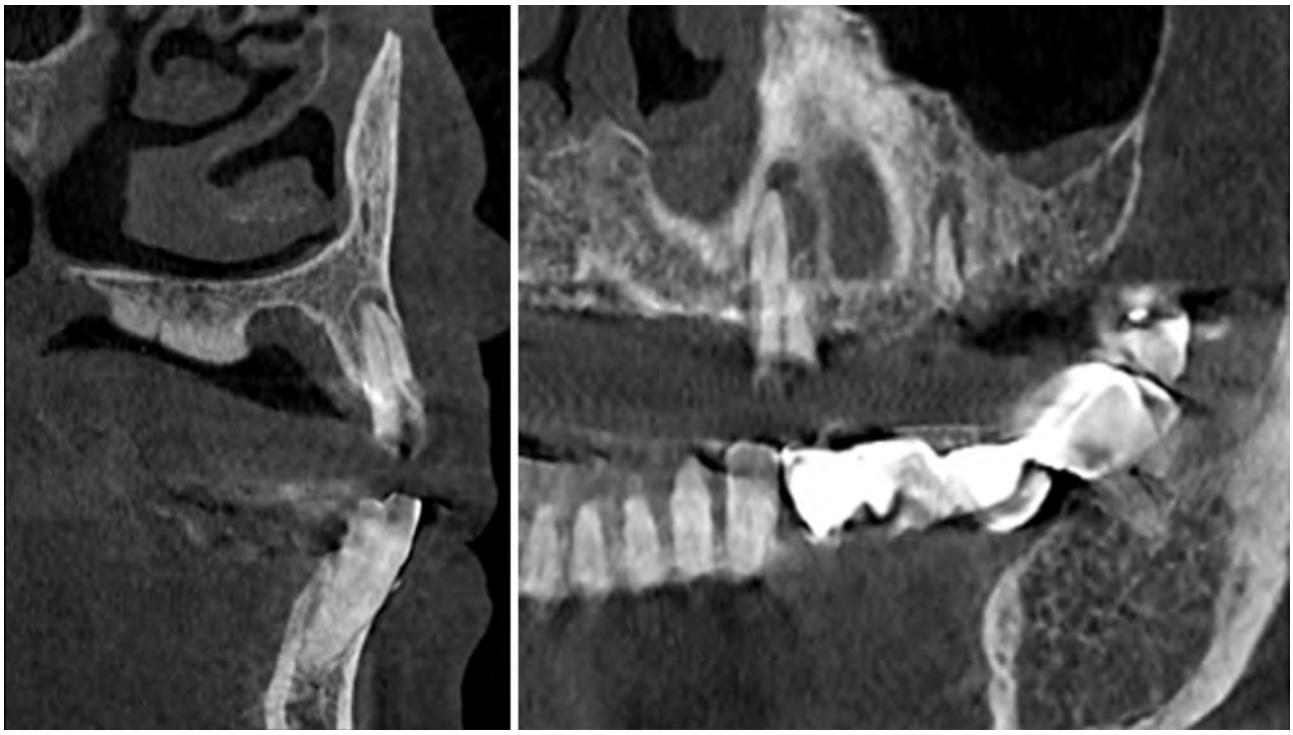


Figure 2. CBCT showed the initial situation

Figure 3. Kugel hook attachment

Figure 4. CBCT showed healing of periapical lesion of tooth 23

After periodontal and endodontic treatments, tooth 23 was prepared with bur TR13, TR-25EF (Mani Inc., Tochigi, Japan) to reduce crown-to-root ratio and its post space was prepared with Peeso reamers (Mani Inc., Tochigi, Japan). Then, impression was taken with putty and light body a-silicon impression material (Zhermack, Italia). Post with attached male part was fabricated with the pattern resin (GC Corporation, Tokyo, Japan) and cast. The steps of fabricating removable dentures were performed simultanously with the post fabrication to save time for the patient. The metal post was cemented to the root of tooth 23 using Fuji Plus (GC Corporation, Tokyo, Japan).

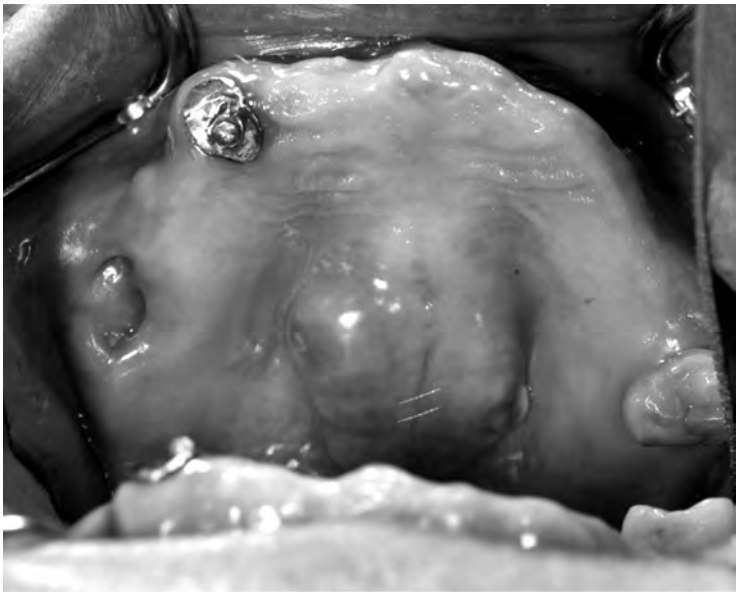


Figure 5. The metal post was cemented to the root of tooth 23

New overdenture was fabricated after primary and final impressions, occlusal registration, try-in. At the denture delivery's appointment, female part of the attachment (Kugel hook, Yamahachi Dental Co., Japan) was mounted on the male part of the post and clinical pick up procedure is performed chairside using the self curing dental acrylic (Pattern resin LS, GC Corporation, Tokyo, Japan) after ensuring no contact between denture and female part.

By implementing this protocol, an optimal definitive result could be achieved, together with immediate patient satisfaction.

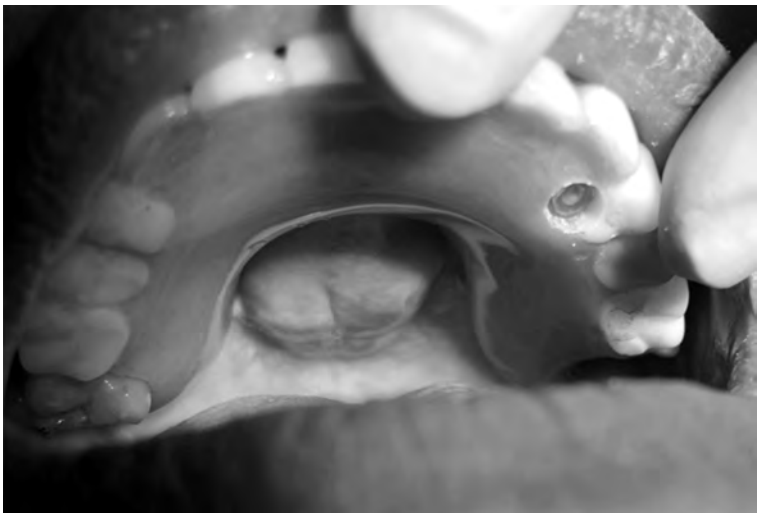
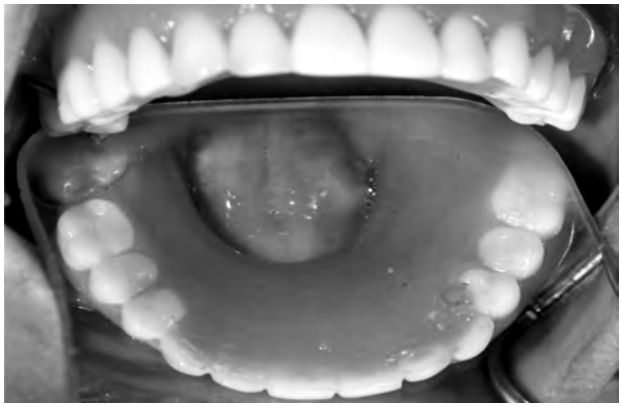


Figure 6. Clinical pick up procedure of Kugel hook attachment



(A) Maxillary tooth-supported overdenture

(B) Bite check

(C) Mandibular crowns and bridges

Figure 7. Final results of upper and lower prostheses

4. CONCLUSION

The incorporation of attachment into the tooth supported overdenture improves the support, retention and stability of the restoration and slows down the bone resorption process. This is one of the goals of preventive prosthodontics.

REFERENCES

[1] Y Langer, A. Langer, "Root retained overdentures". *Part 1. Biomechanical and clinical aspects JPD*, 66, 784-9, 1991.

[2] D. Lakshman, Implant Supported Overdenture for the Atrophic Mandible. NYSDJ, 2010.

[3] R. Walters, "Vertical alveolar bone changes related to overdenture abutment teeth". *JPD,* 57: 309-14, 1987.

[4] A Fenton, "The decade of overdentures 1970-1980", *JPD*, 79, 31-36, 1998.

Hàm phủ trên răng: Báo cáo ca lâm sàng

Phạm Nguyên Quân

TÓM TẮT:

Đặt vấn đề: Bảo tồn chân răng thật trong điều trị phục hình về cơ bản là để cải thiện khả năng nâng đỡ, lưu giữ và vững ổn của phục hình. Khái niệm về hàm phủ trên răng với attachment được dựa trên sự giảm tỉ lệ thân/chân cùng sự kết hợp lưu giữ trên attachment tùy chỉnh để cải thiện khả năng lưu giữ cho hàm giả. Mục tiêu nghiên cứu: Nhằm trình bày các bước lâm sàng để thực hiện hàm phủ trên răng với attachment đúc ở bệnh nhân có torus hàm trên lớn. Đối tượng và phương pháp nghiên cứu: Một bệnh nhân nữ 60 tuổi đến khám vì muốn làm lại hàm tháo lắp do lung lay răng trụ. Bệnh nhân có torus hàm trên lớn và kéo dài đến đường rung A. Phương pháp điều trị cuối cùng là nhổ những răng lung lay quá mức và giữ lại chân răng hàm trên để làm răng trụ cho hàm tháo lắp mới. Trình tự điều trị sau điều trị nha chu và nội nha là sửa soạn ống mang chốt, lấy dấu và đúc ống mang chốt. Các bước thực hiện hàm giả tháo lắp được thực hiện song song với quá trình làm chốt đúc để tiết kiệm thời gian cho bệnh nhân. Attachment (Kugel hook) được gắn trên phần dương của chốt đúc và được dính vào hàm giả bằng nhựa tự cứng. Kết luận: Việc kết hợp attachment vào hàm phủ cải thiện khả năng nâng đỡ, lưu giữ và vững ổn của phục hình đồng thời làm chậm quá trình tiêu xương. Đây là một trong những mục tiêu của phục hình phòng ngừa.

Từ khóa: *Hàm phủ trên răng, attachment, phục hình tháo lắp*

Received: 15/09/2022
Revised: 20/10/2022
Accepted for publication: 20/11/2022