CASE SERIES

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DOI: 10.2478/asmj-2023-0005

Total and partial magnetic retained overdenture. A clinical report.

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Abstract

An overdenture is a denture supported partly by soft tissues and partly by retained teeth or implants. Magnetic tooth-retained overdentures are used to increase support, retention, and stability but also prevent alveolar ridge resorption. Magnetic attachments increase the retention of partial or complete dentures regardless of the path of the insertion and, in addition, can be used for abutment teeth with periodontal disease. This paper discusses two oral rehabilitation cases with total and partial tooth-retained overdenture.

Keywords: magnetic attachment, overdenture, complete and partial edentulism.

Introduction

An overdenture is a denture supported partly by soft tissues and partly by retained teeth or implants. The connection between the remaining teeth and the denture is made with attachments, which are rigid or resilient connectors that redirect the occlusal forces. The attachments like bar and clip, stud, or magnetic attachment increase the stability and retention of the denture.

Magnetic devices were introduced in prosthetic dentistry since the 1960s [1]. Since then, dental magnets have spread widely into prosthetic dentistry; current magnetic devices can be used successfully for natural abutments or osseointegrated implants [2, 3]. The magnets are manufactured in small dimensions, so they are used as retentive devices for complete dentures, removable partial dentures, obturators, and maxillo-facial prostheses [4].

Compared to implant-retained overdenture, tooth-retained overdenture is a cost-effective and straightforward treatment modality [5]. Conventional tooth-retained overdenture placement involves embedding the magnetic assembly into the denture base and introducing its corresponding keeper into the abutment root. The magnetic assembly holds the keeper with a retentive force [6].

This clinical report presents two oral rehabilitation cases with total and partial magnetically tooth-retained overdenture.

Presentations of case series

The first patient is a 52 years old male in good health with difficulties in mastication that wants a fixed restoration (figure 1). Computer tomography reveals insufficient bone for immediate implant placement due to extractions and maxillary sinuses pneumatization (figure 2).

During the discussion of treatment options: an implants-supported restoration or a removable denture, the patient decides on magnet-retained overdenture because it is affordable, the final restoration is ready in a shorter period compared with implant-borne restoration, and relies on magnetic-attachment retention.

Figure 1. Preoperative aspect

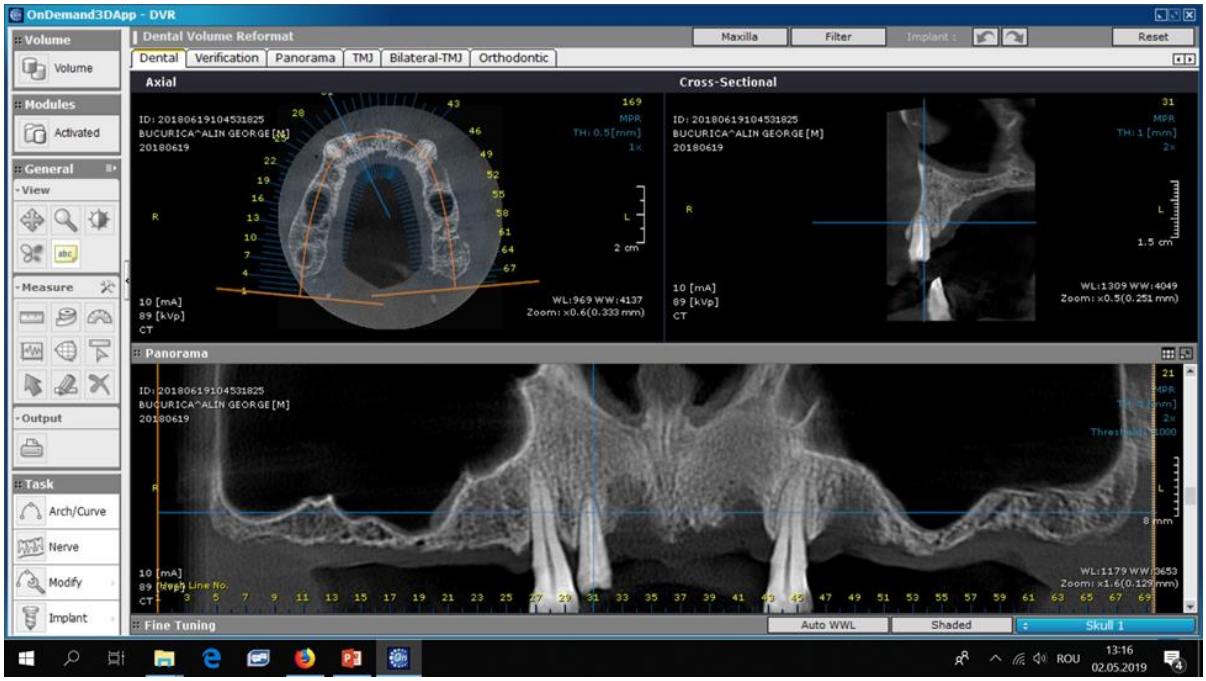

Figure 2. Imagistic aspect of maxillary arch

The treatment plan includes a professional cleaning, root canal treatment for chosen abutment teeth, upper canines, preparation of abutment teeth for magnetic attachments, and reduction of remaining lateral incisor at the gingival level and sealing with a composite filling. The impression is taken for cast dowels and individual tray.

The magnetic attachments used are Magfit® DX, Aichi Steel Corporation, Japan. The magnet is thin, has a round shape, and is embedded in the denture base. The keeper is cemented into the root canal.

Abutment teeth need root canal treatment and crown section. The preparation of each abutment tooth involves a chamfer-type margin line, slightly divergent walls of the root canal, and a slightly convergent axial wall.

After cementing the keepers', the functional impression is taken, and recorded the occlusal relationship. A complete maxillary overdenture

is fabricated, improving the patient's appearance and mastication (figures 3 and 4).

Figure 3. Maxillary magnetic retained overdenture – mucosal aspect

Figure 4. Postoperative aspect

The second case is a 60 years old female patient with osteoporosis (figure 5). She complains about old bridges, which move, and mastication difficulties. She requests dentures as prosthetic treatment because of the medical conditions and the cost of implant therapy.

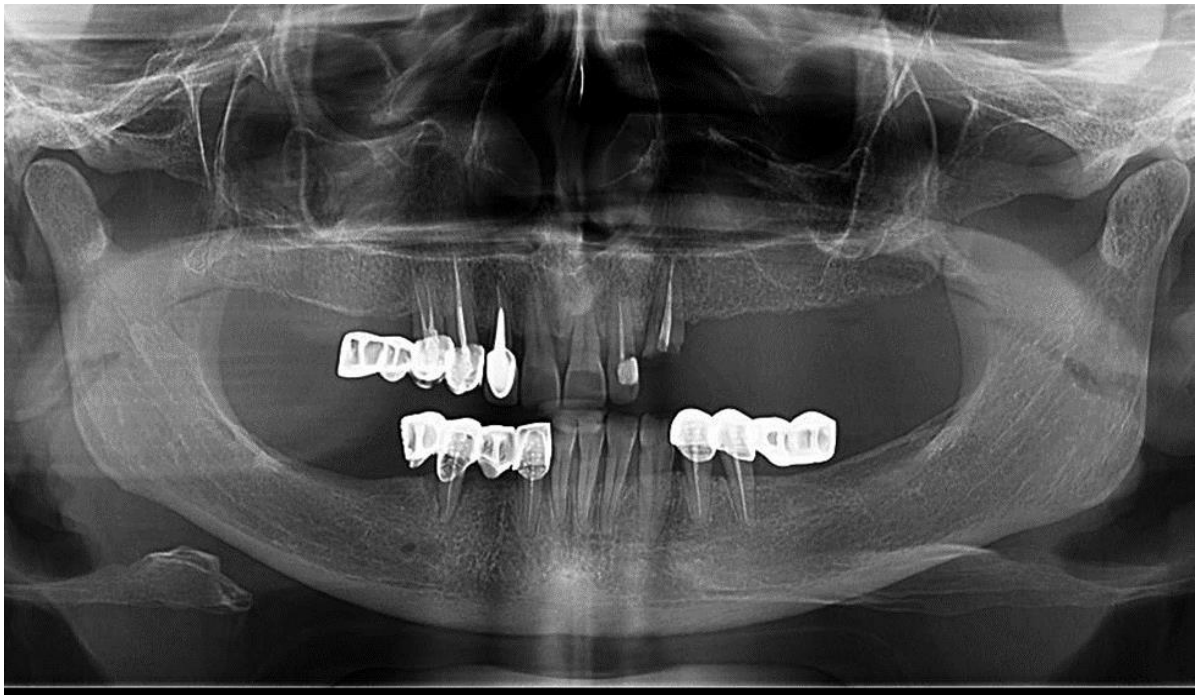

Figure 5. Preoperative orthopantomography.

The treatment plan involves removing the old bridges, extracting mobile teeth (1.4. and 4.4.), and rehabilitating magnetic-retained partial overdenture with abutment teeth 1.3. and 2.3. for the maxilla and mixed prosthesis (bridge and partial skeletal denture) for the mandible (figures 6 and 7). The same magnetic abutments, Magfit® DX, are used for maxillary partial overdenture.

Figure 6. Mucosal aspect of magnetic retained partial overdenture.

Figure 7. Postoperative aspect.

Discussions

The main objective in removable prosthodontics is to preserve the remaining teeth structure and the alveolar bone. Tooth-retained overdentures transfer occlusal forces to the alveolar bone through the periodontal ligament of remaining teeth, consequently preventing alveolar bone resorption.

The overdenture with magnetic attachments is a practical choice for abutment teeth with chronic periodontal disease because the magnetic assembles dissipate the lateral stress on the abutment teeth and improve clinical crown-to-root ratios [7, 8]. Even when the quantity of bone supporting the remaining teeth is not adequate for other attachments, it is suitable for magnetic attachment because cutting the crown improves the crown/root ratio, and no friction is involved in retaining the overdenture.

Another advantage of magnetic attachments is that they do not depend on a particular insertion path like other attachments [9]. They can be used for partial or complete overdentures alone or with other retainers.

Due to affordable treatment costs is a better alternative for implant overdenture [10].

Magfit® DX is suitable for a wide range of cases owing to its small size; it is suitable for situations where vertical space is limited [11]. The magnet is round and must be checked on the abutment root. Always root diameter should be wider than the magnet diameter to achieve the best magnetic force. In both cases, abutment teeth are maxillary canines that have adequate magnet sizes. Because the magnet is thin and the artificial canine has a good amount of structure, overdenture hide the magnet efficiently.

The evaluation at 6, 12, and 24 months after treatment reveals good condition for remaining roots and dentures. No structural or functional modifications were found during the examination.

The disadvantages include: it is more expensive than a simple denture, and the magnet can cause image distortion during the magnetic resonance imaging of the head and neck [12].

Conclusions

Magnetic-retained overdenture is an uncomplicated treatment method. It is easy to use because it does not require special skills or equipment and has multiple patient benefits.

The advantages of magnet retained overdenture are: simplicity, efficiency, low cost, minimal trauma for retained root, and no need for adjustment.

Conflict of interest: None to declare.

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Received: December 18, 2022 / Accepted: January 23, 2023