

Improve the quality of life with magnetically implant-supported overdenture

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ABSTRACT

A 50-year-old female came to Hasanuddin University Dental Hospital Makassar with chief complaint of masticatory problems due to a denture that had been used for 9 years was loose, causing pain when eating. Intra-oral examination showed that the patient is completely edentulous. The mandibular alveolar ridge had resorbed. The patient was treated with an implant-supported overdenture with magnetic retention in the mandible. The maxilla is treated with conventional denture as there was still part of the maxilla that could be used for retention. After obtaining the patient's consent and confirming that the patient had no parafunction, two implants were placed on the body of the mandible using single stage implants. Right and left implants were 12.0 mm long and 4.0 mm diameter. Both the magnet and the attachment shield were coated with titanium nitride (TiN). It is concluded that magnetically implant-supported overdenture can restore masticatory function and the quality of life.

Keywords: implant, magnetic overdenture, resorbed alveolar ridge, quality of life

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INTRODUCTION

Continued bone resorption in mandibular edentulous patients is a major challenge in prosthetic rehabilitation with conventional dentures. Loss of retention, stability and support is a serious problem for mandibular complete dentures compared to maxilla, especially if the mandible is very flat.

Treatment with implant-supported overdenture (ISO) may be the best solution for this case. ISO is a complete removable denture combined with an implant to increase stability in the oral environment, provide greater retention by using magnets, and support the underlying tissue.¹

Advantages of an ISO due to its removable properties are easier to clean, improved denture movement and phonetics; prevention of parafunction, increased masticatory efficiency and maximum myoelectric output.^{1,2}

The magnets consist of two parts, the one magnet attached to the denture side and the other one to the implant side. They are simple and convenient for the patient. However, they are susceptible to corrosion by saliva, which is why they are rarely used clinically.

The current development of a new generation earth magnets is made of aluminum-nickel-cobalt (AlNiCo), which is resistant to corrosion. This new attachments may still be the treatment of choice for edentulous patients with Parkinson's disease, as they are unable to keep the denture stable, but also require less force to insert and remove dentures.^{3,4}

The AlNiCo alloy magnets have been used in dentistry for many years. Initially, repulsive forces such as polar magnets are utilized from the open-field AlNiCo alloy embedded in the base of the up-

per and lower dentures, so that the repulsive forces will keep the denture on the residual ridge. However, this approach achieved little popularity because of its weak strength, and the direction of the force it was likely to be repelled by the denture out of the mouth. A more popular method is to attach a ferromagnetic metal guard (generally made of stainless steel) to a tooth or implant for traction by magnets embedded in a nearby denture base; This arrangement is known as magnetic guard unit.⁵

The magnetic system developed at this time introduced the rare alloys of samarium (SmCo) and neodymium (NdFeB) in a closed field system. Rare earth alloys produce stronger and more stable magnetic forces than ever before available because it has high magnetization and high resistance to demagnetization. In a near-field system, a magnetic field or flux is contained in the magnet-keeper unit and earn a lot an attractive force that is greater per unit measure than possible with an open field system. Newer closed-field magnets also have higher attractive forces per unit of measure when guard and magnet are in contact, although this force diminishes rapidly when magnet and guard lose contact.⁵

In addition, a new system has been introduced for seal the metal capsule around the magnet and thus to protect it from corrosion in the mouth. According to for its manufacture, less than 1 in 10 capsules associated with overdentures in natural teeth separated from the denture base for 8 years clinical trials; more interesting, no experience loss of magnetic attraction.⁵

This article is aimed to discuss a case about to improve the quality of life with magnetically implant-supported overdenture.

CASE

A 50-year-old female came to Hasanuddin University Dental Hospital Makassar with chief complaint of masticatory problems caused by 9-years-old denture that felt loose and wobbly, causing pain when eating. Intra-oral examination showed that the patient is completely edentulous. The lower jaw alveolar ridge had already gone through resorption (Fig. 1, 2). The patient forgot when the last tooth extraction was performed and needed a new removable denture that accommodates mastication and has good retention.

MANAGEMENT

The treatment plan was aimed to restore oral function including mastication, using an implant-supported overdenture with magnetic retention in the mandible while in the maxilla a conventional denture because there was still a portion of the maxilla that could be used for retention. After obtaining the patient's consent and confirming that the patient had no parafunction, two implants were placed on the body of the mandible using a single stage (Fig. 3, 4, 5).³ Right and left implant had a length 12.0 mm and a diameter of 4.0 mm. Both the magnet and the attachment guard are coated with titanium nitride (TiN) as self-healing resin.

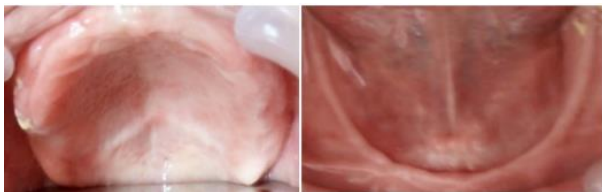


Figure 1 Intra oral view, the maxilla and mandible, before insertion of the implant



Figure 2 Panoramic radiograph, before and after insertion of the implant

DISCUSSION

In conventional dentures, there is increased bone loss and soft tissue abrasion due to horizontal movement of the prosthesis under lateral loads. Mandibular jaw movement and muscle action can lift the denture from the soft tissues during function and speech. To address this problem, an ISO is indicated. Implant placement will improve the support, retention and stability of the denture. Installation of 2 implants on the left and right in the caninus region will maintain the height of the alveolar

ridge and maximize retention so that the denture does not rotate and is stable in place. This condition will provide good support for the tissue under the denture so that it does not cause excessive resorption.

In a retrospective study, it was concluded that from both biological and prosthodontic aspects, there was no difference in performance of complete dentures supported by only 2 implants on the left and right of the arch, due to increased retention, stability, and occlusal equilibration of the denture and not the number of implants used as supports.⁶



Figure 3 The two magnetic attachments supported by the implants



Figure 4 Conventional complete denture on maxilla and mandible implant-retained overdenture with magnet



Figure 5 Two magnets bonded to the mandible overdenture

However, two implants support overdenture requiring minimal surgical intervention, that is much cheaper to manufacture, easier to clean, readily accommodates aesthetics and phonetics variable, providing better support for facial muscles, and offer higher levels of patient satisfaction attached more efficient to obtain retention and stability of denture teeth.⁷⁻⁹

The manufacture of implant support overdentures provides retention and stability and maximum denture support. The wearer is not afraid the denture will fall out, can speak well and most importantly the wearer can use it to chew food well so that nutritional intake is guaranteed. This condition will improve their quality of life.

It was concluded that magnetic attachments

can be used to retain mandibular implant overdenture. Patient satisfaction over the first year was excellent, especially for patients who had been less than satisfied with mechanical attachments. This new generation of magnetic attachment can

be applied in a straightforward manner and offers the potential for long-term durability. Mandibular overdenture, implant support can increase the wearer's confidence, so that it will improve the quality of life. Acknowledgment None.

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