Scholars Journal of Dental Sciences (SJDS) **ISSN 2394-496X (Online)**
Sch. J. Dent. Sci., 2015; 2(1):1-5 **ISSN 2394-4951 (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjds.2015.v02i01.001

Case Report

Magnet retained Overdenture: A case report

Dr. Ronak N. Patel[1*], Dr. Sarvesh S. Patel[2], Dr. Rajesh Sethuraman3, Dr. Tamanna Chhabra[4], Dr. Ninad Bhatt[5], Dr. Jatan Patel[6]

[1,2,5,6]Post Graduate part III, K. M. Shah Dental College, Sumandeep Vidhyapeth,Vadodara, Gujarat, India
[3,4]MDS, K. M. Shah Dental College, Sumandeep Vidhyapeth,Vadodara, Gujarat, India

***Corresponding author**
Dr. Ronak N. Patel
Email: ronak1028@gmail.com

Abstract: Recent advances in dentistry have enabled different treatment options in prosthetic dentistry, one of them is in relation to magnets which are available in small size and with strong attractive force. This magnets can be used for overdenture attachments which increases the stability of denture and reduces the lateral forces on abutment tooth. Rationale for tooth supported overdenture are to preserve the alveolar bone and proprioception feedback. Proprioception of periodontal ligament helps to sense position and movements of mandible, it prevents excessive occlusal load and also improves masticatory performance. Magnet retained overdenture may also be an alternative option for abutments with reduced periodontal support. There are different types of magnetic attachments available commercially. Here in this case report magnetic attachment of megfit is used for overdenture.
Keywords: magnet, overdenture, pattern resin.

INTRODUCTION

Tooth loss is known problem related to oral disease, Compromised periodontal health and aging. But whenever possible extractions should be avoided as maintaining these roots or teeth aids in preservation of periodontal proprioception, reduces alveolar bone resorption. Proprioceptors of periodontal ligament provide discrete discriminating sensory input than the mucosa which helps to sense position and movement of the mandible and prevent excessive occlusal load and thus improves the masticatory performance[1].

In prosthodontics any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants is known as overdenture or overlay prosthesis[2]. There are different attachment systems available to retain overdenture from which commonly used are: bar and clip, magnets, ERA system, O-ring.

Magnets have been used previously to stabilize the prosthesis in patient with advanced alveolar bone resorption[3]. During initial period Al-Ni-Co magnets were used which were replaced later by samarium-cobalt (Sm-Co) magnets. As Sm-Co magnets were fragile they were substituted by neodymium-iron-boron magnet which are the commonly used in today's dentistry. These magnets are small yet with enough retentive force to hold the denture and have good resistance to demagnetization. One of the limitation is poor resistance to corrosion by oral fluids for which they can be enclosed in anticorrosive steel and also meets the international standards for physical effect to tissue due to magnetism. Several different use of magnets in dentistry are in sectional prosthesis, as retainer of RPD, attachment for implant retained overdenture.

CASE REPORT

63 year old female patient reported in department of prosthodontics crown and bridge, with the chief complaint of difficulty in chewing due to missing teeth. ACP classification class II Extra oral examination showed facial form ovoid, profileconvex, facial muscle tone normal, adequate mouth opening. Mandibular movements were smooth with normal TMJ. Intraoral examination a showed completely edentulous maxillary arch. Mandibular arch showed only three teeth present which were 34, 35, 44.(Fig.1)

On the basis of the clinical findings, the different treatment options possible for this patient were.

1. Extraction of remaining teeth followed by conventional complete denture.
2. Cast partial denture with or without attachments

3. Extraction followed by implant supported prosthesis
4. Tooth supported overdenture with or without attachments

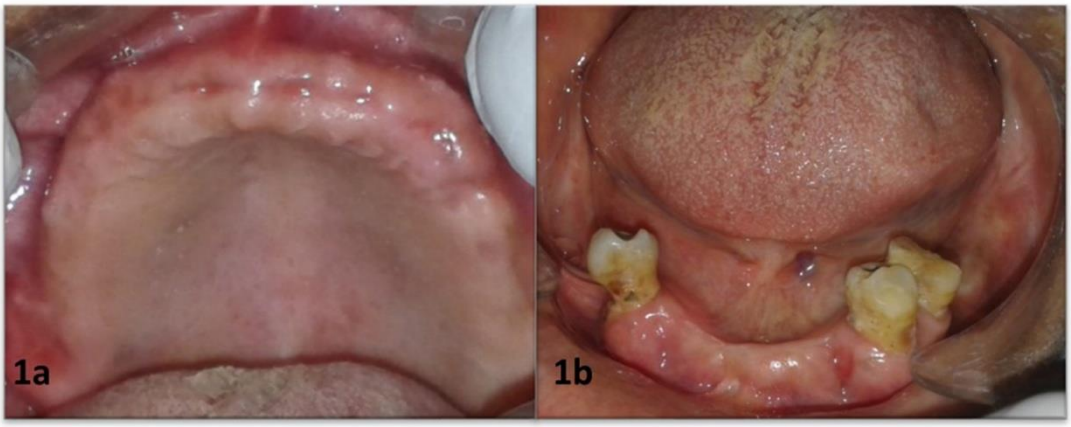

Fig-1a & 1b: Intra oral view of maxillary and mandibular ach.

The case was planned to receive tooth supported overdenture using magnets. Root canal treatment done in all remaining teeth. The location of the remaining teeth was favourable for an overdenture. A diagnostic jaw relation was taken to analyzethe amount of space available for any attachment. The space was found to be sufficient for using magnetic attachments. Primary impression of the maxillary arch was made using medium fusing impression compound and mandibular arch was made using irreversible hydrocolloid (Fig.2a). Than cast was obtained 1mm spacer was applied on mandibular cast and 0.5 mm spacer was applied on maxillary cast and special tray was fabricated.

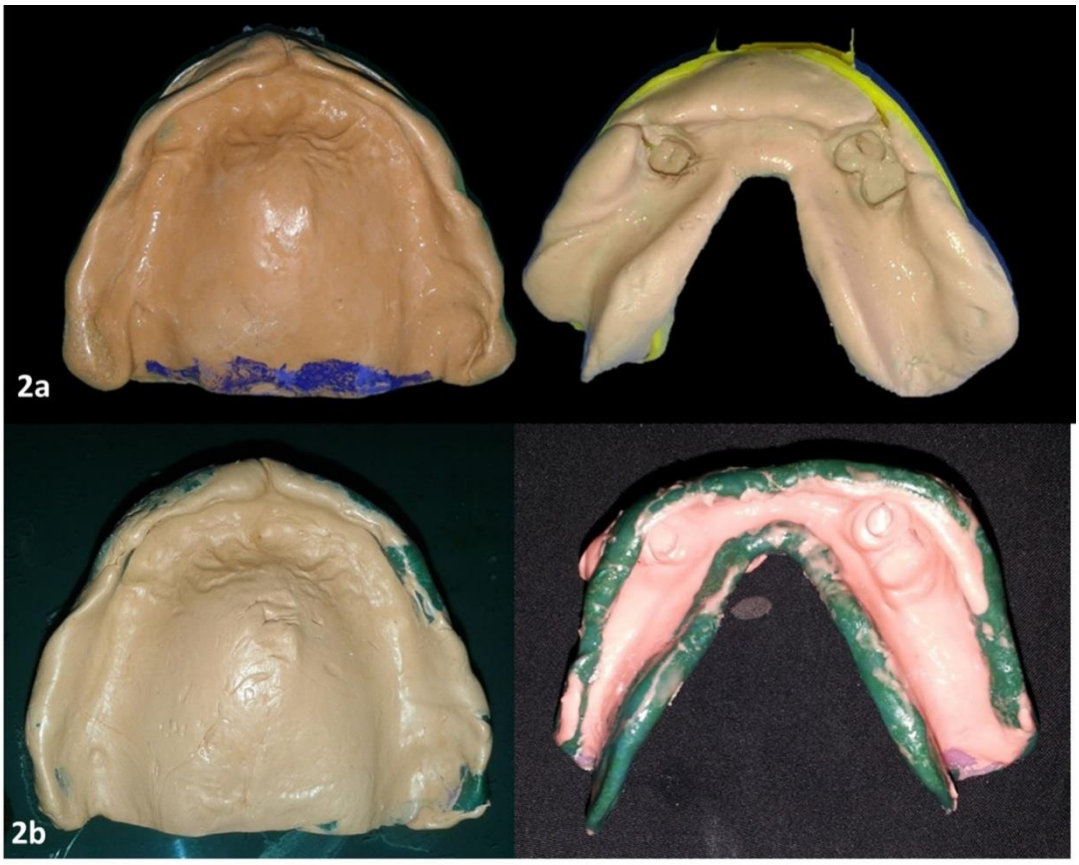

Fig-2a: Primary impression. Fig-2b: Secondary impression.

After confirming from the patient about the treatment options, it was decided to use the remaining teeth as abutments and fabricate an overdenture with metal copings and magnetic attachments owing to the

obvious advantages of the retention of the roots. Attachment selected was MAGFIT DX 600 (Fig. 3) closed field type of size 4mm × 1.2mm depending on the available space. There are different sizes available for these attachments. Attachments were planned in 44 and 34 and metal copings on tooth number 35.

.

The aburtment tooth height was about same as the gingival margin. A bevel around the circumference was made. Surface shape of the root tooth was concave. Post space preparation (Fig.4) was 5 degree tapper and 5 mm in length 0.7mm anti-rotational groove with straight was made to prevent the rotation of the root cap. Post space impression was made with pattern resin and keeper was incorporated in the pattern. Dimpled surface of the magnet was facing toward the post space and shiny surface was towards the occlusion plane. This procedure was done in tooth number 34 and 44. In tooth number 35 only coping was planned. Resin pattern for metal copings was fabricated for tooth number 35(Fig.5) (pattern resin from GC, America).The patterns were invested and casted as per manufactures recommendations for magnetic attachments. The castings were removed and carefully inspected for any casting defects the castings were carefully trimmed and polished before cementation of the cast posts with keepers(Fig.6), the tooth canal was carefully conditioned and irrigated using sodium hypochlorite. The metal coping and cast posts containing keepers were carefully cemented using Resin modified Glass Ionomer cement .Excess cement was carefully removed without disturbing the cemented prosthesis.

Fig-3: Magfit DX 600 magnets.

Fig-4: Tooth reduction and post space preparation.

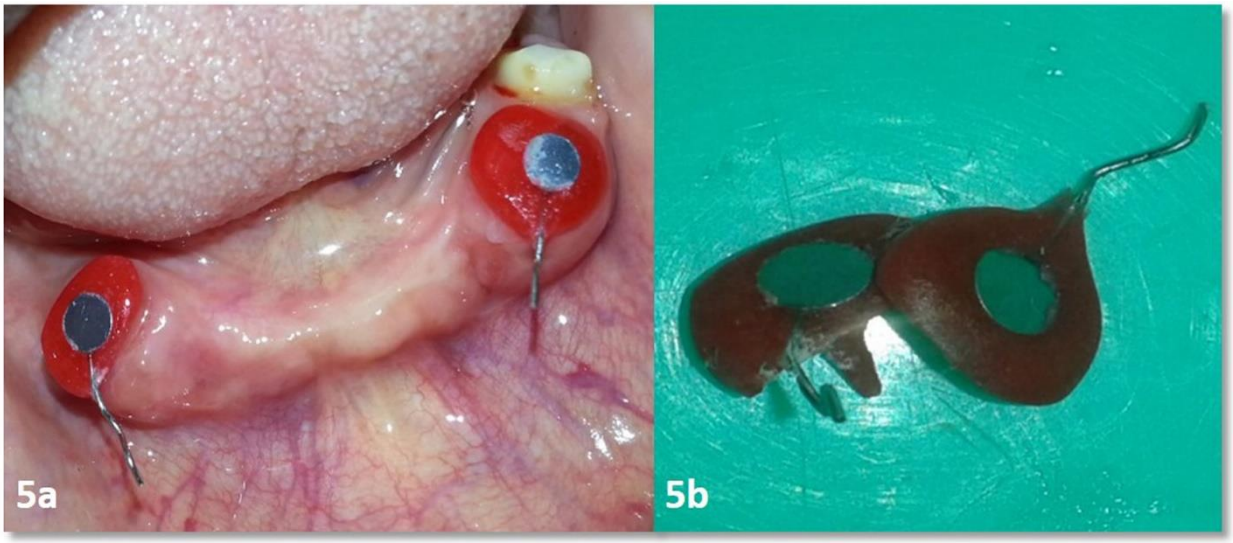

Fig-5a & 5b: Resin pattern of post space canal with magnet keeper attachment.

Fig-6a & 6b: Casted metal coping with magnetic keeper attachment.

Fig-7: Positioning of the magnet on keeper in mouth for pick-up.

Fig-8: Magnet incorporated in denture.

Fig-9: Frontal view of denture intraorally.

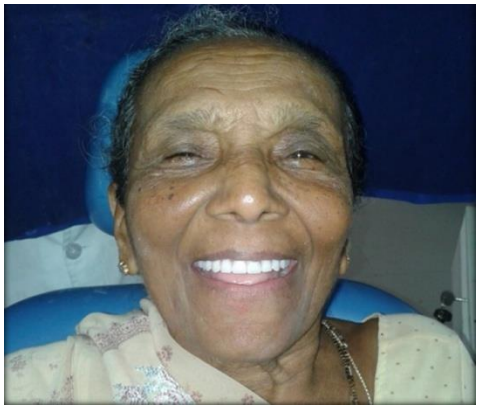

Fig-10: Post operative view of patient.

Border molding using low fusing compound was done for mandibular arch and maxillary arch. Maxillary final wash impression was taken with zinc oxide eugenol paste. And for mandibular arch wash impression was taken with the polyvinyl Siloxane light body(Fig 2b). Both impressions were carefully poured in dental stone and final casts were obtained. Occlusal rims were fabricated on final cast and Jaw relation was done. After taking a face bow record and mounting the rims on the articulator, teeth were arranged and try in was done after the approval of try in by the patient, the denture was processed using Heat cure acrylic resin. Further steps of jaw relation, facebow record, articulation, arrangement of teeth, try in and fabrication of denture done by conventional method of fabrication of conventional denture. The dentures were carefully trimmed and polished after retrieving from the flasks. Dentures were inserted in patient's mouth and necessary adjacent were made. Border extensions and occlusion were checked. To incorporate magnets in the denture, the area on the impression surface of the mandibular denture corresponding to 34 and 44 region where magnets were need to be placed was scraped to make space for magnets. The magnets were positioned on the keepers in the mouth(Fig.7). Resin was added to the scraped area and the mandibular denture was placed over the magnets in mouth underproper occlusion. After the resin was set, denture was removed with the magnets picked up in the mandibular denture(Fig.8). Excess resin was trimmed and denture polished. After polishing the denture was again placed intraorally(Fig.9) and checked for comfort, occlusion and retention. Patient was instructed how to wear and remove the denture, on denture maintenance and oral hygiene as well. Patient was recalled after 24hrs, after 7 days and after 15 days. On recall it was observed that

patient was satisfied with his new dentures and was able to masticate properly.

DISCUSSION

Overdenture is a kind of treatment option which anchors the denture to the abutment to provide better retention, support and stability and also increases the oral health related quality of life of the patients. Previously repelling force of magnets also have been used to prevent dislodgement by embedding magnet in posterior teeth of maxillary complete denture and with repelling magnet in mandibular denture. So as they come in close approximation magnet in upper denture repels the magnet of lower denture to prevent dislodgement[4].

Early attempts for using attractive force of magnet between 2 magnets for denture retention was reported in the early 1960s for denture retention were unsuccessful due to mainly because of the large size of magnets at that time and the inadequate forces [5-6]. Now a days use of rare earth magnets such as Sm-Co and Nd-Fe-B which come in small enough dimensions to be used in dental applications and still provide the necessary force.

There are 2 possible ways by which a magnet can cause injury to the tissue[1].

1. Physical effect due to magnetism.
2. Chemical effect due to corrosion product.

Many aspects like cell toxicity, cell growth, and allergic response were tested for Morden magnets and the results meet international standards. According to Gillings and Samant [7], the lateral forces imposed on the root are very small as magnetic retention presents very little risk of trauma to the root that supports the overdenture. In this case direct technique was use to fabricate coping in which the magnetic keepers were attached. Pattern resin was used for fabrication of copings[8].

Advantages of Magnetic Attachments

1. Small size within overdenture.
2. Magnetic force work together with the negative pressure and adhesive retention of denture base.
3. Increases the stability.
4. Easily constructed without special technique.
5. Insertion and removal of overdenture is easy.
6. Reduces lateral forces on the abutment tooth.

Disadvantages of Magnetic Attachments

1. Loss of retention due to corrosion or heat instability
2. Requires encapsulation within inert alloys
3. Difficult to repair
4. Higher cost than few other attachments
5. Limited force transmission - Magnets can slide on their keepers.

Compare to conventional partial dentures, magnetic overdentures are more stable, retentive and easily removed and seated [9-10]. Magnetic attachments facilitate oral hygiene because retentive areas of the dental biofilm are smaller [11]. Overdentures supported by magnet attachment achieve greater satisfaction.

CONCLUSION

Overdentures supported by magnet attachment achieve greater satisfaction. Magnet retain over denture gives better retention, stability, comfort and fit of the denture. The technical simplicity, the usefulness for geriatric and handicapped patients, the increased control of jaw function trough the maintained periodontal ligament and the physiological action of magnetic forces in the tooth axis are arguments for the use of magnets. Magnet-retained overdenture preserving natural abutment teeth has better proprioception and satisfaction, and also is psychologically beneficial as the patient had not undergone extraction.

REFERENCES

1. Patil R, Mistry G, Shetty O; Harnessing Retention Through Attraction. Academic Journal, 2013; 6 (5):26-32.
2. The Glossary of Prosthodontic terms. Edition 8, J Prosthet Dent, 2005; 94(1): 58.
3. Carreiro AFP, Guerra CMF, Moraes SLD, Neto AF, Torres EM; The use of a magnetic attachment in a removable partial denture of a patient with periodontal tissue loss. Int J Dent, 2009; 8(4): 215-219
4. Moghadam BK, Scandrett FR; Magnetic Retention for overdentures. J Prosthet Dent, 1979:41(1):26-29
5. Behrman SJ. The implantation of magnets in the jaw to aid denture retention. JProsthet Dent, 1960;10:807-841.
6. Behrman SJ Magnets implanted in the mandible: aid to denture retention. J Am Dent Assoc, 1964;68:206-215.
7. Gillings BRD, Samant A; Overdenture with magnetic attachments. Dent Clin North Am. 1990;34:683-709.
8. Boberick KG, Wyke D; Use of a flexible cast for fabrication of multiple post-coping overdenture restorations. J Prosthet Dent. 1999;81(3):365-368.
9. Riley MA, Walmsley AD, Harris IR; Magnets in prosthetic dentistry. J Prosthet Dent, 2001;86:137-142.
10. Matsumura H, Kawasaki K; Magnetically connected removable sectional denture for a maxillary defect with severe undercut: A clinical report. J Prosthet Dent, 2000;84:22-26.
11. Thean HP, Khor SK, Loh PL; Viability of magnetic denture retainers: a 3-year case report. Quintessence Int, 2001;32:517-520.