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## **Implant-Supported Overdenture Using Ball Attachment: A Case Report**

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### **Abstract**

Edentulism has been an enduring factor in the field of dentistry. Implant supported overdentures have proved to be one of the best alternative options in prosthetic rehabilitation of various cases of edentulism. They satisfy the patient's expectations, improve quality of life with their long-term serviceability and predictable outcomes. Over conventional complete dentures and removable partial dentures, implant-supported overdentures have significant advantages in terms of practicality. These benefits include reduced bone

loss, prosthesis movement, enhanced aesthetics, better occlusion, improved tooth positioning, increased occlusal function, and preservation of the occlusal vertical dimension. The implant systems and attachment methods have undergone substantial developments throughout time. This paper describes a case report in which a completely edentulous patient was rehabilitated with an implant supported overdenture in mandible and a complete denture in the maxilla.

**Keywords:** Implant Supported Over Denture, Prosthetic Rehabilitation, Ball Attachment

### **1. Introduction**

A patient's transition from a dentulous to an edentulous condition provides a number of obstacles for both the patient and the practitioner, particularly in the mandible where bone resorption is a vital factor to be taken into consideration during prosthodontic rehabilitation. Overdentures that are supported by implants have been proven to be a successful option because they have a number of positive advantages, including the preservation of bone quantity, enhanced retention, stability, function, proprioception, and comfort.

Bone resorption can be reduced by placing implants in the edentulous mandible and then subsequently loading them, since this causes changes in the bone's architecture, form, and volume that result in subperiosteal growth <sup>[1]</sup>. In a consensus conference conducted in 2002, Feine and Carlsson <sup>[2-4]</sup> recommended the 2-implant retained overdenture as the highest level of care for the edentulous mandible. Comparing implant supported fixed prostheses to implant supported overdentures, the former is a more affordable treatment alternative. They provide facial support, are reasonably easy to build, can restore dental and alveolar tissues, and are more aesthetically pleasing. The overdenture has been anchored with the use of ball attachments, magnetic attachments, bar attachment systems and telescopic crowns.

This case report depicts step by step procedure for fabrication of implant supported over denture with Ball attachment for an edentulous mandible opposing a maxillary complete denture.

### **2. Case Report**

A 63-year-old Female patient reported to department of prosthodontics for replacement of missing teeth in relation to both her upper and lower jaws [Fig1]. Her dental history included extraction of the periodontally involved teeth a year ago. Clinical examination revealed completely healed maxillary and mandibular ridges [Fig 2]. Patient was screened according to a protocol that took into account of her general health and treatment possibilities. Orthopantomogram was advised to evaluate bone availability and architecture and a CBCT was also advised to evaluate the quality of bone and location of anatomic structures [Fig 3]. Preoperative radiographs and CBCT exhibited that maxillary ridge was favorable for complete denture construction, while there was severe bone loss and deficiency in height and width in mandible. The interarch distance was assessed and as found to be adequate. Routine blood examination revealed no abnormal findings. Advantages and disadvantages of different

treatment options were discussed and the patient insisted for an implant supported overdenture for mandibular edentulous arch and conventional complete denture in relation to the maxillary edentulous arch.

### 2.1 Denture Fabrication

Primary impression was made using irreversible hydrocolloid and a primary cast was retrieved. Special tray was fabricated on the primary cast. After border molding procedure, secondary impression was made [Fig 4] and master cast was retrieved. Wax occlusal rim were fabricated and Jaw relation was recorded [Fig 5]. Teeth arrangement and try-in procedures were done [Fig 6]. Curing, finishing polishing and insertion of the denture was done. A periodic follow-up of the patient was done. Patient was fully satisfied with both upper and lower dentures. Patient was then recalled for implant placement procedure.

### 2.2 First Stage Surgery (Implant Placement)

Two alphabio ICE implants were placed in Mandibular arch according to standard protocols in right (3.5x10mm) and left (3.5x13mm) canine region [Fig 7].

### 2.3 Second Stage Surgery and Loading

After four months of implant placement, second stage surgery was planned and a 3mm healing abutment was placed. Patient was again recalled after a week for the placement of the attachments. A male attachment (Ball abutment) was selected (0.5mm) and placed on both the implants in mandible and the housing with silicone ring placed above it [Fig 8-9] for which sufficient relief was made on the impression surface of mandibular dentures. Auto-polymerizing resin was mixed and silicone ring with housing was picked-up using the mandibular dentures. During pickup procedure, both dentures were closed in centric relation [Fig 10]. Occlusal adjustment done, post insertion and oral hygiene instructions was given to patient [Fig 12]. A three-month follow-up was done and the patient was satisfied with form, function and esthetics of the prosthesis.

### 3. Discussion

The complete denture patients frequently complaints about the retention and stability of the mandibular prosthesis and also the problems with their oral function. An alternative to the conventional denture would be an implant supported fixed bridges, hybrid prosthetic dentures and removable overdenture prosthesis. In this case report patient she was not satisfied with the retentive qualities of denture and so an Implant supported overdentures was planned as it proved to be the most efficient. Crum and Rooney have found that the bone reduction in the anterior part of the mandible in those patients wearing complete upper and lower dentures amounted to 5.2 mm as compared to 0.6 mm with the overdenture patient [5, 6]. Implant supported overdenture enhances the overall satisfaction and nutritional status of the patient.

### 4. Conclusion

Implant supported overdentures can be a simple, reliable and cost-effective treatment for edentulous patients. Implant

dentures provide the benefits of improved esthetics, phonetics, bone preservation, comfort, all resulting in an improved quality of life for the patient.



Fig 1: Pre-operative photograph of patient



Fig 2: Pre-operative photograph of maxilla and mandible

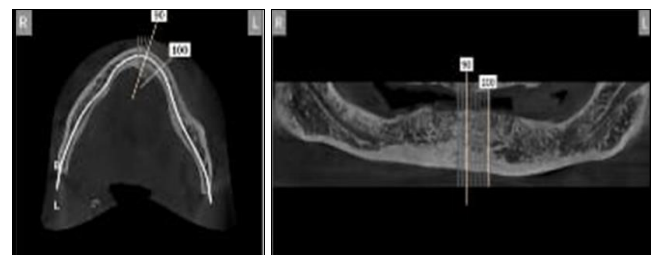


Fig 3: CBCT Images



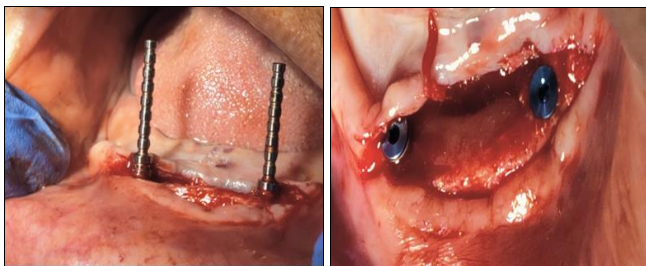
Fig 4: Border moulding w.r.t maxillary and mandibular arch



**Fig 5:** Maxillomandibular relation



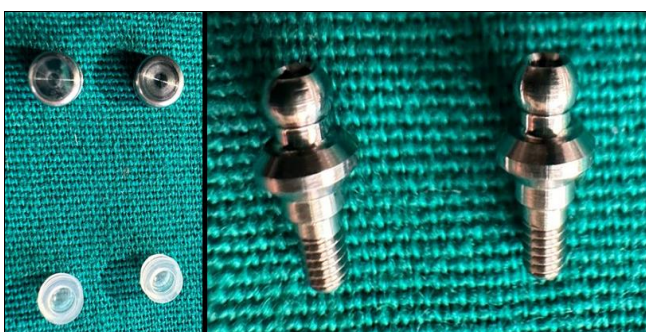
**Fig 6:** Try in



**Fig 7:** Implant placement in mandibular arch



**Fig 8a:** Post operative implant placement orthopantomogram



**Fig 8b:** Ball attachment, housing and silicone ring



**Fig 8c:** Ball attachment placed in mandibular arch



**Fig 9:** Relief made on mandibular denture



**Fig 10:** Patient with final prosthesis



**Fig 11:** Post-operative photograph of patient



**Fig 12:** Finished and polished denture



**Fig 13:** Post operative orthopantomogram with attachments

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