# Effect Of Using Resilient Attachment On Different Cantilever Bar Length On Supporting Structures Of Implant Supported Overdenture

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# Introduction

Implant reconstruction and rehabilitation provide the patients with the opportunity to recapture lost masticatory function restore esthetic and achieve a greater sense of well being of thousands of seriously debilitated edentulous mouths that have been dramatically rehabilitated using osseointegrated fixtures that maintain fixed and removable appliances [(1)].

Implant supported over denture was usually used to achieve stress distribution especially when the opposing arch has natural teeth. It was also indicated for patients with sensitive mucosa, and extreme gag reflex.

Overdentures were sometimes designed to overlie implants with attachments as bars, stud attachments, or magnets [(2)].

Four to six implants were usually required to provide support for the overdenture. Bar was usually used to rigidly connect the implants in the anterior region. Bar clip was placed in housing made in the fitting surface of the denture to overly and fit the bar [(3)].

The overdenture bar attachments were classified by their biomechanical behavior into rigid and resilient attachment. In an attempt to minimize the undesirable forces transmitted to the overdenture supporting structures, a short (8 mm) and long (16 mm) distal cantilever extension bar have been suggested.

Cases that require increased retention such as compromised ridge and cases exhibiting high muscle attachments, prominent mylohyoid ridges have been indicated for cantilever bars. The cantilever design may satisfy the increased demand for retention and tissue protection providing a more economic treatment approach [(4)].

In spite of the functional advantages offered by cantilever supported prosthesis, the distal cantilever bar may cause bending moments which may lead to mechanical failure and subject the abutments and their supporting structures to excessive bone resorption. Many experimental stress analysis methods have been employed to evaluate biomechanical loads. These techniques compromise photoelastic stress analysis, strain gauge analysis, holographic interferromtry and finite element stress analysis [(5)].

Although, long term studies have been published evaluating the generalized effect of overdenture attachment on denture supporting structures, however there was rareness of studies on the effect of the length of distal extension cantilever bar retained design on the overdenture supporting structures. Thus this study was done to evaluate the effect of using resilient attachment on different cantilever bar length on the supporting structures of implant supported overdenture.

# Review of literature

Overdenture was defined according to the glossary of prosthodontics as a removable partial denture or complete denture that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants; a prosthesis that covers and was partially supported by natural teeth, natural tooth roots, and/or dental implants and called also overlay denture, overlay prosthesis, superimposed prosthesis.

Overdenture should be considered a preferred alternative to complete denture therapy especially in patients with badly worn down teeth. Overdenture was indicated for the treatment of cases, suffering from severe attrition associated with Dentinogenesis Imperfecta. The use of cast coping will protect the soft remaining dentition without exerting excessive stresses on the abutments [6, 7].

Overdenture was indicated for patients with cerebral palsy as they often have difficulty in chewing, speaking and swallowing because of the involuntary muscle spasms caused by their condition. These problems also make it very difficult or even impossible for them to wear complete mandibular dentures.

In addition, overdenture was preferred than complete dentures for the treatment of irradiated patients to decrease the risk of osteoradionecrosis and to enhance stability and retention especially in xerostomic patient [8, 9]

The use of maxillary overdenture has been suggested to minimize the destructive changes observed in combination syndrome

in individuals rehabilitated with single denture opposing a bilateral distal extension mandibular removable partial denture [10].

Contraindications for overdenture were relatively few and, above all, were related to the absence of patient's motivation to maintain an acceptable oral environment. Overdenture was contraindicated when the remaining natural teeth were adequate to restore the dental arch with fixed or removable partial denture [11, 12].

It was also contraindicated in cases with insufficient interarch distance and poor oral hygiene. The presence of bony prominence may prevent the insertion of a denture with complete labial flange [13, 14].

# I- Implants:

Dentistry has long thought a superior method of tooth replacement through dental implants which support overdenture and fixed prosthesis [15, 16].

Implantation is the placement of inert alloplastic materials onto or into the jaw bones for the purpose of supplying artificial abutments for retention of a bridge or denture. Most dental implants are supportive and are able to transmit functional occlusal loads directly to the underlying bone [17, 18].

The material to be implantable should be strong enough to resist fracture with over load, of multiple shapes, sizes, with various physical properties, and able to resist corrosion. It must distribute forces of mastication to interfacial tissues in a manner to ensure long term of viability of the implant. Titanium plasma sprayed alloys, porous coated titanium alloys, titanium alloys, alumina, hydroxylapatite, stainless steel, tantalum, vitallium, and vitreous carbon were different materials which were being used [19, 20].

Implantation, was primarily indicated in cases of extreme bone atrophy or poor bone quality that were not feasibly treated with a fixed prosthesis and cases in which proper esthetics cannot be achieved. Cases of distal extension were best treated by the placement of at least one implant fixture on the edentulous side to balance the support [21].

It was used effectively to keep the facial skeleton intact and to splint the adjacent teeth which have advanced mobility prolonging their