Implant Supported Overdentures (ISODS)- The Gold Standadrd For Treatment Of Edentulism

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Implant supported overdentures (ISODs) offer many practical advantages over conventional complete dentures and removable partial dentures(RPDs).These include decreased bone resorption, reduced prosthesis movement, better esthetics, improved tooth position, better occlusion including improved occlusal load direction, maintenance of vertical dimension in addition to better phonetics, patients psychological outlook and quality of life.

Conventional dentures though well accepted over years and deeply entrenched as a standard treatment modality for edentulism offer several disadvantages such as

- Compromised retention

- Instability during function due to complete reliance on residual ridge and mucosa for support and retention
- Misfit denture causing soft tissue injuries, compromised phonetics and social embarrassment to the patient
- Accelerated bone loss causing ridges to become unviable for conventional prosthesis within a small period and ultimately forcing the patient to rely on denture adhesives.

Studies all over the world show that ISODs have superior retention to conventional dentures.

A retrospective study to assess the same was done at our practice, `The Tooth Place`.

Fifteen ISODS (five in maxilla and ten in the mandible) were delivered to eleven patients and one year to five year feedbacks were assessed in their recall visits.

Based on their responses to questions in the questionnaire prepared by us, we came to the conclusion that an ISOD is a far superior treatment option as compared to a conventional denture.

Regardless of the type of attachment used; bar or ball; our patients were more satisfied with ISODs than with conventional dentures. Patients found ISODs significantly more stable and related their ability to chew a wide variety of foods relatively easier, thus improving their nutritional state. They also noted higher comfort levels and better phonetics and an overall improvement in the oral health related quality of life.

This was in assertion to the McGill Consensus of 2002 which cited studies of several populations showing that patients with ISODs enjoy a significantly higher quality of life than those with conventional dentures.

Discussion

Design Considerations:

In our cases we have used the following three types of attachments :

- Ball and socket
- Bar and clip
- Bar with Rhein 83 attachments.

The fourth or Locator attachment has not been used by us.

- Ball and socket attachment:

These attachments have worked well in all cases, maxilla and mandible. The retention and stability has been directly proportional to the number of implants per arch.

It is especially preferred where vertical deficiency or the loss of interarch dimension has not been too much. (Interarch space at CR is between 13 and 20mm)

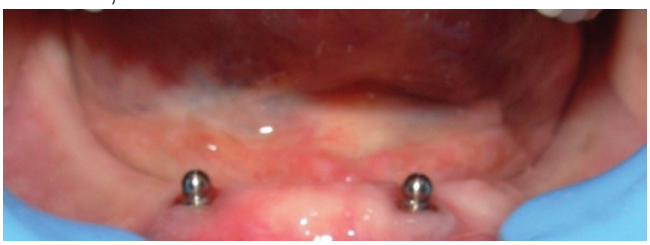


Fig. 1 Two implants placed in the interforaminal position in the mandible.

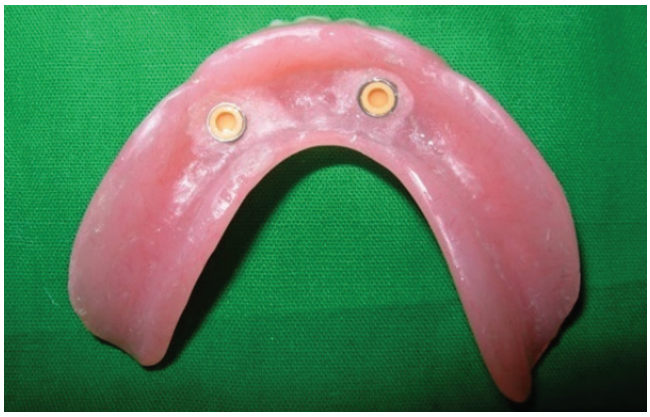
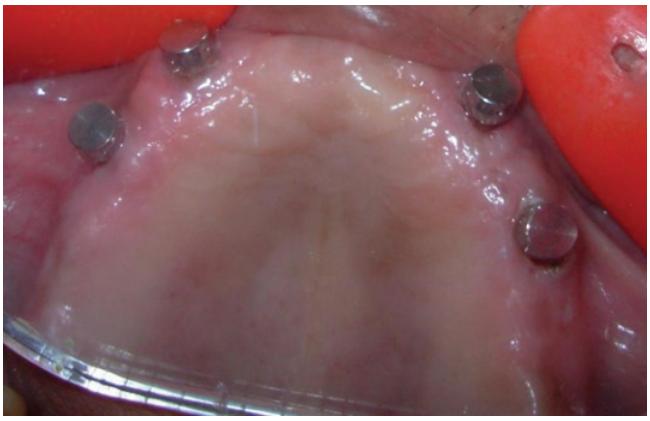


Fig. 2 Socket attachements for two implants in the mandibular denture.



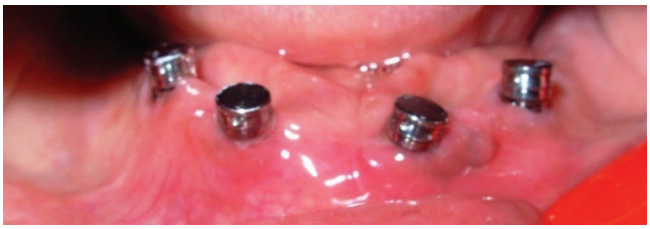


Fig. 3 and 4 : sockets placed on ball attachments ready for pickup on four implants each in the maxilla and the mandible).

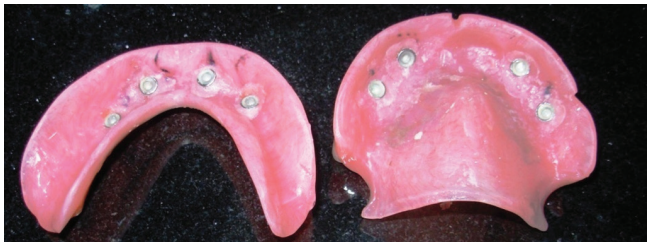


Fig. 5 Sockets picked up with cold cure acrylic in the corresponding denture.

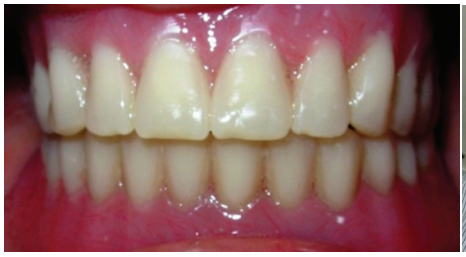


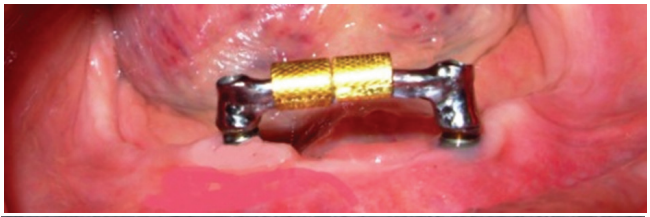
Fig. 6 Centric relation checked.

Fig. 7 The SATISFIED patient.

Bar and clip:

A versatile design for the mandibular ISOD supported on two implants as well as for the maxillary ISOD supported by four implants.

A bar and clip attachment on two implants in the mandible drastically improves retention and stability but allows movements in the transverse axis in the bucco-lingual direction .



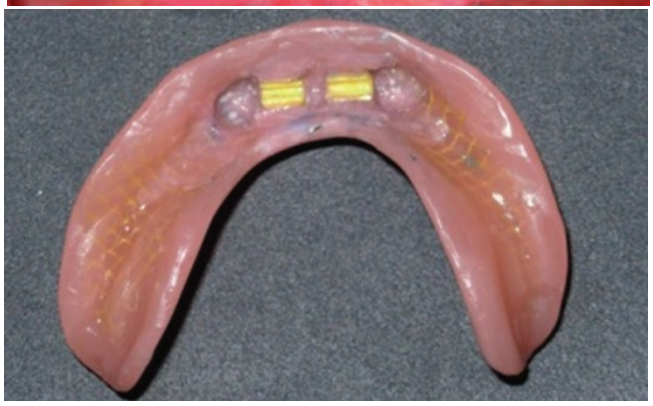


Fig. 8 Bar and Clip Attachment placed on two mandibular implants and the corresponding female components in the denture.

Bar with Rhein 83 attachments

Extremely superior with rigid retention preventing lateral movements.

Especially recommended for case with severe vertical bone loss (Interarch space at CR is more than 25mm).

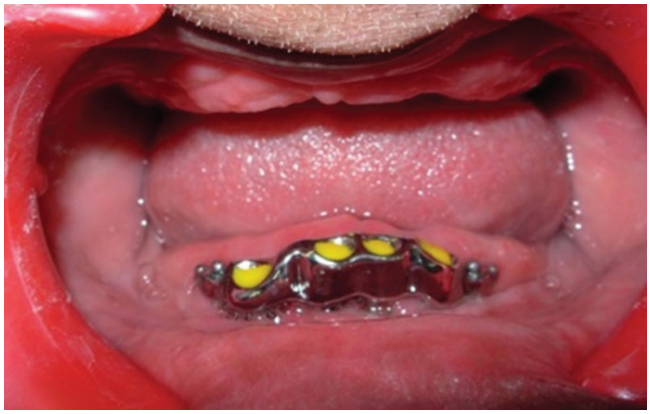


Fig. 9 A 62 yr old diabetic patient with extereme resorption of mandibular bone and excessive interarch space- supported by Rhein83 attachments over four implants

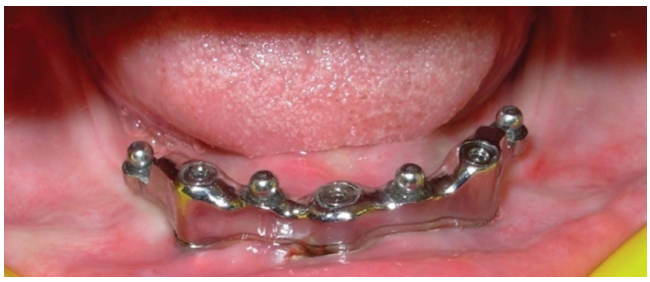


Fig. 10 A 78 yr old diabetic female with severe mandibular ridge resorption treated with bar with Rhein 83 attachments on three implants.

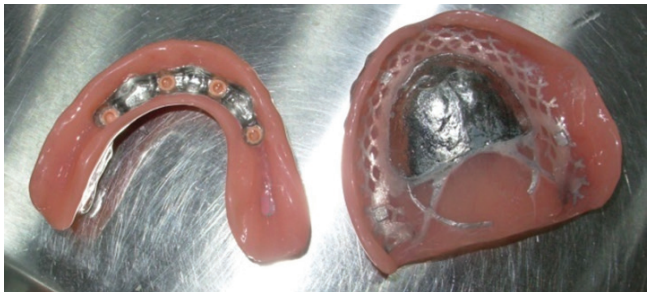
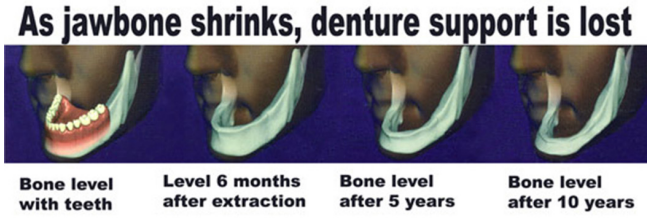


Fig. 11 Mandibular dentures with female component for the bar on the ridge in fig 10
Maxillary denture reinforced with a mesh to withstand higher masticatory stresses due to implant support.

The major indications and advantages of ISODs are as under

1. Preservation of Patients Native bone

Edentulism is characterized by a rapid atrophy of alveolar and jaw bone.



The initial resorption has been pegged at 3 -4mm during the first year reducing to 0.5mm per year, leading to an average loss of 5.2mm vertical bone loss over a 5year period under complete dentures

Implants replace the roots of teeth and as per functional matrix theory , preserve the bone that holds them. Implants once oseointegrated dramatically reduce the rate of bone loss normally attributed to a conventional denture.

Studies have shown that patients with ISODs have less than 0.2mm bone loss in the first year and up to 0.6mm over a 5 year period.

Our own study showed insignificant or no bone loss in the 1-5 year recall period. The bone loss was further insignificant with more number of implants supporting the ISOD.

Maxilla being a relatively trabecular and porous bone as compared to the mandible shows more bone loss around implants due to less bone implant contact. That necessitates placement of more anchoring implants in the maxilla(minimum of four) as compared to the mandible (one , two, three or four)

2. Greater Prosthesis Stabilty

An ISOD achieves great stability in function from the mechanical

attachment of the implant support system retaining the prosthesis.

The chief complaint of the patient wearing conventional complete dentures is the excessive movement of the denture during function. (A mandibular denture moves 10mm in function)

Under these conditions , predetermined occlusal contacts and the control of masticatory forces is nearly impossible.

Implant induced stability helps in the patient consistently reproducing a determined centric occlusion.

An ISOD prevents lateral movements thus minimizing soft tissue trauma.

An ISOD also prevents the vertical movement of the denture during mandibular movement and speech caused by activation of buccinator and or mylohyoid muscles ,thus avoiding clicking noises.

The mandibular ISOD eliminates dependence on tongue and peri-oral musculature to hold the denture thus allowing them to function normally.

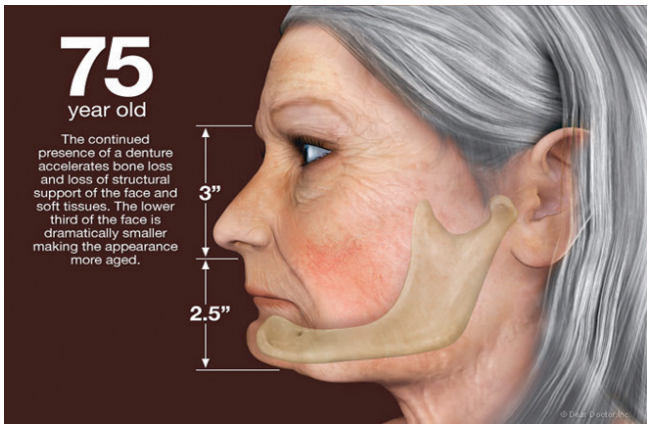
3. Improved Chewing Efficiency

Chewing efficiency is tremendously improved with ISODs and the patient's ability to chew hard foods including nuts , salads is enhanced thus restoring their joy of eating.

The maximum occlusal force of a patient with dentures improves three times with an ISOD, thus improving the chewing efficiency by 20-25% over the bite strength of patients with conventional denture.

Patients with conventional dentures needed 1.5 to 3.6 times the number of chewing strokes as patients with ISODs.

4. Esthetics



In case of severe bone resorption, creating natural esthetics, enhancing facial appearance and compensating for hard and soft tissues is much easier with implant supported overdentures than with fixed prosthesis as the length of teeth can be kept similar to natural teeth due to the presence of a labial flange.

Severe bone loss cases treated with a fixed prosthesis will have extremely long teeth.

Labial flange extensions can also be optimally minimized to reduce the bulk but still providing adequate retention due to implant support.

Labial flanges become very important in restoring the ideal contours of the lower third of the face where severe bone loss has happened in the vertical as well as the transverse dimension.

These labial flanges cannot be incorporated in a fixed prosthesis.

5. Improved Maintenance

- Home maintenance procedures are far simpler with an ISOD as compared to a fixed prosthesis.
- Tissue health and hygiene condition is far superior as compared to a hybrid prosthesis.
- Professional maintenance and peri-implant probing is easier around the bar as well as around ball abutments

6. Surgical and Restorative advantage

Unfavourable implant trajectories can be connected easily in an ISOD than in a fixed prosthesis.

7. Medically Compromised Cases

Just as serving as an efficient treatment option for severe dentally compromised cases (severe bone loss); it serves best for edentulous patients with poor neuromuscular coordination such as parkinsonism and strong gag reflexes.

8. Cost Considerations

An ISOD remains a much more affordable treatment option as compared to a fixed prosthesis.

Even if there is failure of one or more implants , it is easier to modify an existing implant overdenture.

Conclusion

Total edentulism has been noted has been noted in 5 % of all adults who are 40- 45 years old and increasing to 42% in the age group of 65- 75.

Given the increasing number of totally edentulous, having the knowledge to plan and skill to restore the dentition with implant supported overdentures is more important than ever.

Totally edentulous patients can become dentally functional through placement of dental implants to support complete dentures.

It is great injustice to allow patients , especially those who are not too financially restricted to go through their lives without the renovating benefit of dental implants.

Thus Implant Supported Over Dentures remain an excellent treatment option serving to alleviate the absolute shortcomings of a complete denture without the patient opting for a complete implant retained fixed prosthesis.

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