An Overview on Implant Over-Dentures

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Abstract

The ideal goal of modern dentistry is to restore the patient to normal contour, function, comfort, esthetics, speech and health. Implant dentistry is unique in its ability to achieve this ideal goal regardless of the atrophy, disease, or injury of the stomatognathic system. However, the challenges of implant dentistry have been effectively countered by continued research and advancement in diagnostic tools, treatment planning, implant designs, materials and techniques resulting in better treatment planning and predictable success is now a reality for the rehabilitation of many challenging clinical situations.

Keywords: Implant, Overdentures

Introduction

The treatment of edentulous patients with dental implants has become increasingly popular. Many types of prostheses to removable overdentures are currently available. They have shown to be highly efficacious and satisfactory to patients. Overdenture treatment is a notion which precludes the inevitability of "floating plastic" in edentulous mouths. It has always offered a sensible and prudent appeal for dental practitioners, and numerous patients have benefited from this prescription. The overdentures were originally introduced to reconcile a need for maximum support in morphologically compromised dental arches with a desire to improve equally compromised esthetic appearance resulting from under supported circumoral tissues.[1]

Historical Background

Man has attempted to solve the problems associated with the failing dentition. Earliest evidence that exists is of ancient Egyptians in 2500 B.C., when they attempted stabilization of periodontally compromised teeth with the use of gold ligature wire. Another evidence of approximately 500 B.C., the Etruscan population utilized soldered gold bands incorporating pontics from animals to restore masticatory function as a bridge. 1st evidence of the use of implants dates back to 600 A.D. in the Mayan population. In this illustration, implantation of pieces of shell to replicate three lower incisor teeth is shown.[2]

Development Of Overdenture[3]

The idea of leaving roots of natural teeth to support an overdenture is not new.

- In 1856, Ledger described a prosthesis resembling an overdenture. His restorations were referred to as "Plates covering fangs". Later this became the title of a paper published by Atkinson.
- In 1861 a conference held in Connecticut, increased the awareness of the value of such roots in supporting a covering denture.
- In 1888 Evans had described a method of using roots actually to retain restorations.
- In 1896 Essing had prescribed a telescopic like coping. At the same time Peeso also described a removable telescopic prosthesis.
- In 1909 a great blow was delivered by William Hunter by way of his "focal sepsis theory". His views were widely accepted on both sides of the Atlantic, but continental Europe did not share the enthusiasm of Hunter, so overdentures continued to be made.
- In 1976 Rothman stated that Hunter's comments gave dentistry a black eve. The reasons for retaining the root were not always specified but it is likely that denture retention and stability must have been upper most in the clinicians mind. Gilmore was looking for both denture retention and stability, whereas peeso suggested that he was interested primary in denture support.

Advantages[4]

An implant overdenture offers several advantages such as:

1. Fewer implants are required.
2. Prosthodontic appointments are shorter, component costs are decreased, prosthesis is less complicated, and treatment is less expensive for the patient.
3. Long-term professional maintenance and treatment of complications is facilitated.
4. Daily home care is easier.
5. Facial esthetics can be enhanced with labial flanges and denture teeth compared with customized metal or porcelain teeth. The labial contours can replace lost bone width and height and support the labial soft tissue without hygienic compromise.
6. The prosthesis can be removed at night to manage parafunction.

Disadvantages Of Overdentures[4]

- It requires proper plaque control and denture hygiene.
- It is more costly compared to complete dentures.
- They are bulkier than many other restorations.
- The lack of sufficient interarch space makes an overdenture system more difficult to fabricate and more prone to component fatigue and fracture.
- Patient's wearing overdentures may apply more load to their prosthesis than complete denture wearers, yet the inherent strength may be less due to the space occupied by the root preparation.

Indication/ Contraindication

Indications for implant supported overdenture treatment:[5]

- Severe morphologic compromise of denture supporting areas that significantly undetermine denture retention.
- Poor oral muscular coordination.
- Low tolerance of mucosal tissues.
- Parafunctional habits leading to recurrent soreness and instability of prosthesis.
- Unrealistic prosthodontic expectations.
- Active or hyperactive gag reflexes, elicited by a removable prosthesis for example roofless maxillary denture.
- Psychological inability to wear a removable prosthesis, even if adequate denture retention or stability is present.

Absolute Contraindication[6]

1) Recent myocardial infarction – because patient is using potent anticoagulants.
2) Valvular prosthesis:- It is important not to plan any implant surgery until the patient is in stable condition, usually between 15 to 18 months after cardiac surgery, because oral cavity is the principle gateway to infection.
3) Severe renal disorder:- It is the single most important contraindication to any form of implant or bone graft surgery. This can occur from a number of causes, of which the most common are:-
i) Nephritis
ii) Malignancy or tumors
iii) Uncontrolled diabetes
iv) Complication arising from kidney stones
4) Treatment-resistant diabetes.
5) Generalized secondary osteoporosis – in this there is significant loss of bone mass and volume.
6) Chronic and severe alcoholism – Patient with

severe alcoholism often present retarded healing aggravated by malnutrition, psychologic disorder, inadequate hygiene and major infection risk.
7) Treatment – resistant osteomalacia.
8) Radiotherapy in progress – disruption of defence mechanisms, a compromised endosseous vascular system and inhibition of osteoinduction.
9) Severe hormone deficiency – the endocrine systems most affected are thyroid, parathyroid, pancreas, adrenal, pituitary and gonads.
10) Drug addiction – leads to low resistance to disease, predisposition to infection, malnutrition, psychological disorder.
11) Heavy smoking habits – Main problems that occur are, early stage poor healing; disorders related to poor oral hygiene.

Relative Contraindications[6]

1) AIDS and other seropositive diseases (HIV-positive) □ These contraindicate any form of surgery.
2) Prolonged use of corticosteroids :- It is often associated with retarded healing; disorders of phosphocalcific metabolism (osteoporosis), and medullary aplasia. It inhibits bone formation.
3) Disorders of phosphocalcific metabolism.
4) Hematopoietic disorder.
5) Buccopharyngeal tumours.
6) Chemotherapy in progress – administration of anticancer drugs.
7) Mild renal disorders.
8) Hepatopancreatic disorders – Gall stones and infectious and viral hepatitis (severe B, C & E).
9) Multiple endocrine disorders, these include,
- glucocorticosteroid disorders (Cushing's syndrome, Addison's disorder).
- Mineralocorticosteroid syndrome (Conn's syndrome)
- Parathormone (PTH)
- Vitamin D3

10) Psychological disorders.
11) Unhealthy life-style.
12) Smoking habits.

Prosthetic Options For Implant Overdenture

Removable Prosthesis [4]

There are two types of removable prostheses, depending on the amount of implant support.

RP-4: Is a removable prosthesis completely supported by the implants. The restoration is rigid when inserted; overdenture attachments usually connect the removable prosthesis to a low-profile tissue bar or superstructure that splints the implant abutments. Usually five implants in mandible and six to eight implants in the maxilla are required to fabricate completely implant-supported prosthesis in patients with favorable dental criteria.

RP-5: Is a removable prosthesis combining implant and soft tissue support. The amount of implant support is variable. The completely edentulous mandibular overdenture may have two anterior implants, independent of or splinted in the canine region to enhance retention, three splinted implants in the premolar and central areas to provide lateral stability, or four implants splinted with a cantilevered bar to reduce abrasions and to limit the amount of soft tissue coverage needed for support. The primary advantages of an RP-5 restoration is the reduced cost. The prosthesis is very similar to traditional overdentures.

Classification of Attachment (Most Popular):

1. Coronal
- Intracoronal
- Extracoronal

2. Radicular
- Telescope stud (pressure buttons)
- Bar attachments

3. Accessory-Auxillary attachments e.g., screws, bolts.

Various Attachments[6]

Advantage		Shortcomings
Magnets	-Easy to use -Easy to repair -No stress relief	-Questionable retention -Poor lateral stability -Corrosive -Loosen or unthread expensive
Ceka; Octa-Link	-Easy to use -Easy to repair -Good retention -Stress breaking	-Expensive -Requires frequent maintenance -Loosen or unthread
ERA	-Adjustable retention -Easy to replace -Modest in cost	Need frequent replacement
Zest, O-rings	-Inexpensive -Good retention -Stress breaking -Easy to use (O-rings)	-Abutment must be parallel -Less rigid than metal to metal -Wear more quickly than metal
Hader, Dolder	-Stress breaking -Easy to maintain -Easy to repair and replace	Expensive
Pinlock, low	Easy to maintain -Easy to use	Expensive

Conclusion

The implant overdenture is an especially attractive treatment because of its relative simplicity, minimal invasiveness, and economy. Existing complete dentures can be converted for many patients and maintain facial support with the denture flange when moderate to extreme alveolar ridge resorption is present. The implant overdenture is supported by both implant and mucosa and therefore fewer implants are necessary than for the prosthesis supported only by implant.

The overdenture usually consists of two or more implants placed within alveolar bone on opposite side of the arch. Connected to the implants is an attachment device that has a corresponding coupling unit processed to the tissue surface of the complete denture. When the attachment components are appropriately connected, the complete denture is held in position on the mucosa and both mucosa and implants provide support, retention and stability. The overdenture is easily removed for hygiene. When the treatment involves independent implant maintenance access for oral hygiene is favorable because of easy access around the abutments.[7,8,9]

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