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Single implant overdenture – a more sustainable treatment option for resorbed mandible: A case report

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Abstract---Rehabilitation of edentulous patient is done by dentist with the fabrication of complete denture. It is commonly observed that mandibular dentures are not satisfactory when compared to maxillary denture due to centrifugal resorption of mandible. Thus rehabilitation of atrophied edentulous mandible by using implant to support and retain the prosthesis is an acceptable treatment option. It adds to the denture stability, increase masticatory efficiency and comfort of the patient. The present case report discuss about a patient with prosthodontics rehabilitation consisting of single implant supported overdenture.

Keywords---resorbed ridge, single implant overdenture, implant overdenture.

Introduction

Edentulism is a persistent chronic condition and therapy is palliative i.e intended to improve value of life and function. According to one survey, approximately 9% of the geriatric patients are not able to wear their dentures due to severe atrophy of the ridge leading to “Dental Cripples or facial collapse.” In most of the cases a full mouth edentulous patient is rehabilitated with a conventional complete denture. The success of a complete denture relies on the principles of retention, stability and support. But due to resorbed alveolar ridge it usually results in denture soreness, reduced retention and stability, low chewing efficiency, and difficulty in phonetics. So, Implant supported overdentures is considered boon in such cases as it enhances their esthetics, functions, emotional well-being, physical health and mental health. The multitude of advantages to the edentulous population from implant overdentures are prodigious.

With the definitive benefits over conventional denture, the implant therapy is still a costly procedure. As the number of implants increases, unfortunately it also increases the treatment cost which makes it an unaffordable treatment option for some patients because of financial dependence in old age on the family members which should be considered while planning the treatment. Thus the concept of a single Implant prosthesis is gaining popularity due to cost effective and also less surgical trauma to the geriatric edentulous patients.

Case report

A 67 year old female patient came to the department of prosthodontics with the chief complaint of ill-fitting lower denture and also difficulty in mastication and speech. Patient is old denture wearer and she already had 4 sets of denture in the span of 5 years due to the same. On intraoral examination, it was revealed that patient had resorbed alveolar ridge in mandibular posterior region which lead to inadequate retention of the mandibular denture (fig-1). The maxillary ridge was favorable.

An OPG was done and it was found that the bone was severely resorbed as per Misch classification⁹ (fig.2) .Thus it was planned to place 2 intra-foraminal implant to support lower prosthesis. But due to economic constraints of the patient, it was later decided to go for single, mid-symphyseal implant overdenture.

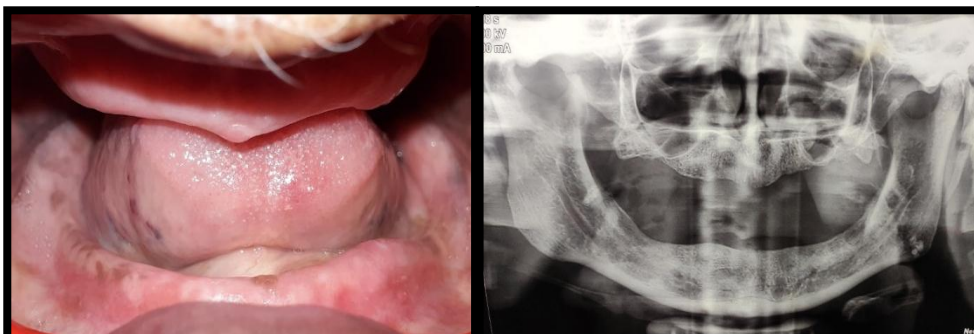


Fig: 1 Intraoral Inspection Of The Ridges

Fig: 2 Pre- OP OPG

Blood investigations was done and informed consent was taken after discussing the treatment procedure with the patient and the attendee. Irreversible hydrocolloid impression (Zelgan-India) was made and pre-surgical diagnostic casts were prepared. Tentative jaw relation was recorded and cast mounted on semi-adjustable articulator (Hanau wide vue, Teledyne US). Inter-occlusal distance was measured and the location of implant and attachment type was planned.

Surgical Phase

Pre-operative antibiotics Amoxicillin 2 gm (novamax 500, cipla-india) were prescribed and patient was prepared in with standard aseptic protocols. Local infiltration of 2% lignocaine with 1:80,000 adrenaline (lignox, indoco-india) was done and also bilateral mental nerve block was given to secure complete nerve block. A mid crestal incision was given with bard parker 15 blade and full thickness mucoperiosteal flap was reflected to expose the underlying bone. Endosteal implant (Dentis -U.S.A) of dimension 3.9 x12 mm was inserted at C site (Misch Classification) following proper osteotomy drill sequence under copious irrigation (fig.3). Cover screw was placed and flap was approximated with direct interrupted 3.0 black mersilk reverse cutting needle suture (Vicryl Plus, Ethicon-india). An orthopantograph (OPG) was taken to verify the implant angulation and position (fig.4). Patient was prescribed Amoxicillin 500 mg (novamax 500, cipla-india) three times a day and ibuprofen 400 mg three times a day for 5 days. Standard post-operative instructions were given to the patient. The patient was recalled after 7 days for suture removal. The healing was uneventful at the surgical site.

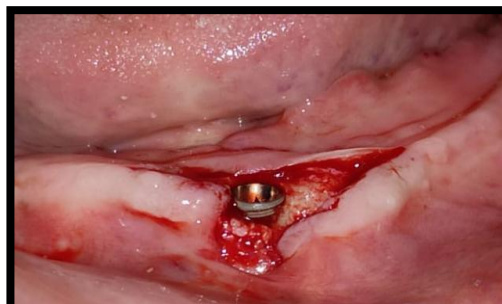


Fig: 3 Placement of implant intraosseously



Fig: 4 Post OP OPG

On recall visit after 3 months, second stage surgery was performed. The Cover screw was replaced with gingival former (fig.5). Two weeks thereafter, gingival former was replaced with standard 2mm ball attachment (fig.6).



Fig: 5 Gingival Former Placed After Stage II Implant Surgery



Fig: 6 Placement of Ball Abutment

Prosthodontic Phase

The upper and lower primary impression was made with irreversible hydrochloride (Algitex DPI-India). And further poured in dental stone (lab stone, kalabhai-India) and custom trays were fabricated in self-cure acrylic (DPI-RR, cold cure, India). Incremental Border molding was done with green stick compound (DPI Pinnacle, Tracing sticks- India) then final impression was made in zinc oxide eugenol (DPI, Impression paste-India) impression paste (fig.7). Master cast was fabricated. Jaw relation were recorded. Trial done and processed in heat cure acrylic resin (DPI, Heat cure-India) O-ring attachment (Dentis-U.S.A) were placed on ball abutment & undercut was blocked in carding wax. The tissue surface of lower prosthesis was selectively relieved in attachment area and a passive fit of prosthesis intra-orally was obtained.

The pick-up of female attachment was done with self-cure acrylic (DPI RR, Cold Cure-India) & further polishing was done (fig.8). The fit and retention of the

prosthesis was assessed and the patient was greatly satisfied by esthetic & function .The post insertion instructions were given to the patient & recall visits were planned at 1 week, 3months and 6 months.



Fig: 7 Border Moulding Done and Impression Made



Fig: 8pick-Up of attachments in the denture



FIG-9 Pre-operative



FIG-10 Post-operative

Discussion

Although Two Implant supported overdentures proves to be the most efficient treatment option in case of resorbed ridges but there are viable reports comes regarding single implant supported mandibular OVD as a treatment option for atrophic mandible. According to **cardioli et al** successfully effective result comes when single implant OVD is given. The use of one implant has shown to be biomechanically sound which provided better denture stability and very good option economically as compared to two implants. It also avoids rotational forces which is commonly observed in two implant supported OVD. It is seen that single ball attachment are cheaper, less technique sensitive and easier to maintain hygiene as compared to bars. Moreover, the probability for mucosal hyperplasia reportedly is less with solitary ball and socket attachments. In the present case, the patient was fully satisfied by the new mandibular overdenture. Patient chief complaint was duly addressed with a retentive and stable overdenture.

Conclusion

The use of single mid symphyseal implant to retain an overdenture can be considered a viable treatment option for edentulous mandible. The treatment modality is gain more importance in elderly edentulous patients. Where there is a need to reduce surgical trauma, surgical time and cost factor is also a limitation. However other clinical parameters such as masticatory efficiency, varying arch shapes can be further evaluated in various clinical trials to validate the result obtained in this case report.

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