JOURNAL OF APPLIED DENTAL AND MEDICAL SCIENCES

ISSN NO. - 2454-2288 www.joadms.org Vol. I Issue II July-September 2015

CASE REPORT

Rehabilitation of atrophic mandible with implant retained overdenture: Modified occlusal concept

Farhan Durrani[1]

[1]Associate Professor,Faculty Of Dental Sciences,Institute Of Medical Sciences,Banaras Hindu University,Varanasi,India

ARTICLE INFO

Article history:
Received 7th July 2015
Accepted 11th Aug 2015

Keywords:
implant,overdenture,atrophic,mandible.

ABSTRACT

Implant-stabilized overdentures can be used successfully to restore the atrophic edentulous mouth, and there are many good reasons why this treatment should be selected in preference to using fixed dentures. This article describes surgical and prosthetic rehabilitation of atrophic mandible with modified occlusal concept.

Case History

The 72 year old patient complained of inability to chew properly, and the existing denture moved during mastication and normal tongue movement. Further, there was a problem with retention and stability of the denture causing recurrent tissue trauma. The patient denied a history of smoking, betel chewing, or alcohol consumption. The patient was physically healthy and was free from any medical history of systemic diseases. The laboratory data of routine blood and serum biochemical analysis were within normal limits. The mouth was completely edentulous with increased interocclusal space with low lip line. The maxilla demonstrated a bowl-shaped resorption pattern with only a partially preserved ridge contour. The atrophic ridge in the mandible had reduced to the basal bone level with only a thin band of non keratinized gingiva. [Fig 1]

Radiographic Examination

Three dimensional 3D diagnostic and treatment planning showed a resorbed mandibular ridge anteriorly with mental foramen reaching the crest bilaterally, the posterior ridge showed a distance of about 6 mm from the inferior alveolar nerve to the alveolar crest. Wical KE et al[1] developed a useful system to determine and classify the amount of mandibular resorption by measuring the distance from the inferior border of the mandible to the inferior border of the mental foramen and then multiplying by three, a reliable estimate of the original height of the alveolar ridge can be obtained. The amount of resorption can be easily calculated and classified into 3 patterns. Approximately two thirds of the mandibular alveolar bone is presenting the class 1 (mild) resorption pattern. A class 2 (moderate) resorption pattern occurs when approximately one third to two thirds of the mandibular alveolar bone remains. Approximately one third or less of the mandibular alveolar bone remains in a

* *Corresponding author: Dr Farhan Durrani ,Associate Professor,Faculty Of Dental Sciences Institute Of Medical Sciences, Banaras Hindu University,Varanasi,Up 221001 Mobile 09335873366*

class 3 (severe) resorption pattern . Our patient can be classified as in between class 2 and class 3 as per panoramic evaluation. Maxilla had severe resorption of alveolar ridge and complete pneumatization of maxillary sinus.[Fig 2,3,4]

Fig 1: Atrophic Edentulous Mandibular Ridge

Implant Selection Rationale

The selection of the implants was done on the basis of 2mm osteoplasty procedure ,width gained was 5.5mm in between the foramania region .Four implants of 4.3 mm by 13 mm were placed in A,B,D and E positions of edentulous mandible .This was according Misch[2] treatment planning concept of edentulous mandible for implant retained overdenture. Research has suggested that short implants experience lower survival (higher failure rates) when compared with longer implants. It has been recommended that root form implants be as long and as wide as possible, within the anatomic limitations of the patient[3].This does not mean that the use of short implants is contraindicated. As long as bone volume is reasonable, and the patient has a favorable medical history, looks reasonably healthy, does not smoke, drink, or use illicit drugs, and satisfactory home care can be expected, there is nothing contradictory about using short implants.

Surgical and Prosthetic Report

The diagnostic template fabricated from existing denture was transformed into a surgical template for implant surgery. The surgical template helped to identify the tooth positions and their location on the mandible. Under

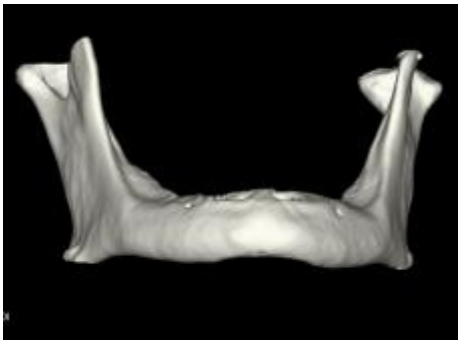

Fig 2:Dentascan View of the Atrophic Ridge

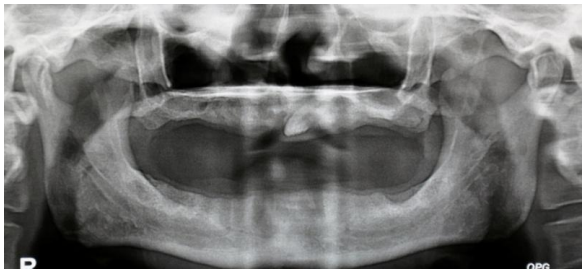

Fig 3: Panoramic View of the mandible

infiltration anesthesia, a crestal incision was made that split the tissue between the mental foramina. Care was taken when approaching the foramen and blunt dissection was used to locate the openings. Four internal hex regular-platform implants, 4.3 mm in diameter and 13 mm in length, were inserted (Uniti,Equinox). The inter foramen area was 44 mm in length and the ridge was 5.5 mm .This dimension was adequate for four 4.3 mm implants by 11 mm. As the arch form was ovoid, implants were equidistant from each other, that was about 5 mm [Fig 5]. One implant failed after one month which was changed with wider implant and of short length. Postoperatively patient was kept on antibiotics and anti inflammatory drugs for seven days and patient was told not to wear the lower denture for two weeks. After three months prosthesis fabrication started with proper verification with radiographs and percussion of implants .Indirect impression transfers were attached on implants, angulations, axial loading and final restoration

Fig 4: Cephalogram

outline were verified. Custom trays were fabricated and polyether impression material was used because of its hydrophillicity for border molding and final impression. Abutments were seated on the implants and verified with radiographs, vertical dimension was established along with centric records, this will also establish maxillary occlusal base. Tooth shade and shape selection was done along with face bow and protrusive bite registration. Teeth were arranged and occlusion was established according to the concept of anterior protective occlusion .Occlusal scheme with no anterior contact in centric relation position and minimal anterior contact in excursions; and posteriors will be in medial positioned lingualized occlusion, further reducing the combination syndrome effect. This concept was important to protect the maxillary bone as there will be continuous maxillary ridge width reduction independent of prosthesis type. In the laboratory connecting bar was waxed to reside within the contours of the lower denture and attachments positioned several millimeters below the teeth. Casting was with cobalt chromium molybdenum, the bar was completely parallel to the plane of occlusion without any cantilever with height of 2mm.This will further reduce the loading forces and the clips were positioned on intaglio surface of the denture with spaces around them[Fig 6]. The prosthesis designed was bar and clip with a low profile type 2 attachment.[Fig 7,8,9,10,11]

Fig 5: Four Implants in the mandible equidistant from each other

Fig 6: Intaglio Surface of the denture with clips

Fig 7: Bar screwed on the abutments

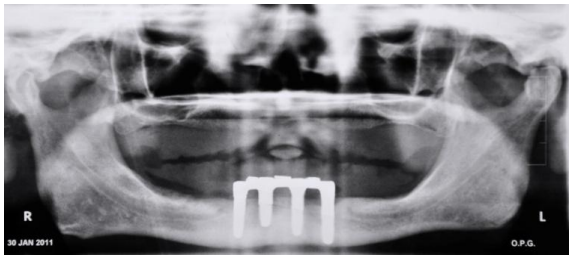

Fig 8: Radiograph with the bar

Discussion

Several studies have said that overdenture supported by two implants or three or even four implants, the success rate of the prosthesis or the patient acceptance level is not much of a difference [4]. Recently some authors have reported that single implant is adequate for an over

Fig 9: Right excursive movement with no contact in anterior area

Fig 10: Left excursive movement with no contact in anterior area

Fig 11: Final Prosthesis

denture retention and can result in high success rate comparable to over denture supported by multiple implants [5.] However quality and shape of mandibular bone determines the position and number of implants that can be placed[6.] For present case four implants with acceptable platform were easily placed in between foramen. Approximately 17 years ago Steenberghe etal[7] proposed possibility of using over denture supported by two Branemark implants to treat mandibular denture problems with 98% success rate, he further elaborated of placing fewer implants in advantageous sites rather than placing as many implants in limited space to completely rehabilitate an edentulous ridge for fixed or overdenture prosthesis. Four implants with a bar are the best method for rehabitilation of complete atrophic edentulous mandibular arch [8] .The functional requirement with the chosen prosthesis will increase biomechanical support for patient's poor anterior and posterior lower ridges. Maxillary denture was tissue supported without use of implants. The reason for this type of chosen prosthesis was for the best satisfaction to the patient, a design which can satisfy functional as well as esthetic, social needs of the patient to great extent. However a study conducted by Feline et al[9] said that contrary to expectations, masticatory function of subjects with implant retained overdenture was no less effective than in subjects with fixed prosthesis. Thiel et al [10] recommended no anterior contact in centric relation position and minimal anterior contact in mandibular excursive movements. The vertical movement of the prosthesis was mainly in anterior aspect. Thus described occlusal concept was considered important to preserve maxillary bone.

Conclusion

There was complete change in patient's feelings towards the prosthesis; the feeling of fixed teeth in the mouth was overwhelming . Mandibular overdenture showed higher patient satisfaction than complete dentures. Occlusal concept with minimal or no anterior contact in centric

relation was considered important to preserve maxillary bone in mandibular excursive movements.

REFERENCES

1.Wical KE, Swoope CC. Studies of residual ridge resorption. Use of panoramic radiographs for evaluation and classification of mandibular resorption. J Prosthet Dent . 1974 Jul;32(1):7-12.

2. Misch treatment planning concept of edendulous mandible for implant retained overdenture, Contemporary Implant Dentistry. 3rd: Mosby Elsevier.

3. Winkler S, Morris HF, Ochi S. Implant survival to 36 months as related to length and diameter. Ann Periodontol 2000;5:22–1.

4. Meijer et al. Mandibular overdentures supported by two Brånemark, IMZ or ITI implants: a 5-year prospective study.J Clin Periodontol . 2004 Jul;31(7):522-6.

5.Harder et al.Three-year clinical outcome of single implant-retained mandibular overdentures-Results of preliminary prospective study. Journal of Dentistry 2011; 10: 656-661.

6.Batenburg et al. Bone height measurements on panoramic radiographs: the effect of shape and position of edentulous mandibles. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1997 ; 84:430-5.

7.Steenberghe et al. The applicability of osseointegrated implants in rehabitilation of partial edentulism,a prospective multicenter study of 558 fixtures. Int journal of oral and maxillofacial implants 1990 ;5:272-81.

8. Regina D, Mericske-Stern et al. Management of the edentulous patient Clinical Oral Implants Research 2000; 1: 108-25.

9.Feine et al. Within-subject comparisons of implant-supported mandibular prostheses: evaluation of masticatory function. J Dent Rest 1994;73:1646-56

10.Thiel CP, Evans DB, Burnett RR. Combination syndrome associated with a mandibular implant-supported overdenture: a clinical report. J Prosthet Dent. 2004 Jul;31(7):522-6.

How to cite this article: Durrani F. Rehabilitation of atrophic mandible with implant retained overdenture: Modified occlusal concept. JOADMS 2015;1(2):13-17.
Source of Support: Nil, Conflict of Interest: None declared