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# Prosthetic Rehabilitation of a Patient with Alzheimers Disease using a Combined Ball, Bar and Clip Retained Implant Supported Overdenture: A Case Report

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**Introduction-** Alzheimer's disease (AD) is a progressive degenerative disease that affects the cognitive skills of an individual. It is a type of dementia which causes difficulty in orientation, emotional instability, loss of abstract thinking, motor skills and personal care.

The common clinical symptoms of the disease are aphasia (loss of the ability to use speech and language), apraxia (loss of ability to perform learned and familiar movements), visual agnosia (inability to recognize familiar visual stimuli) and memory disorders<sup>1</sup>. The individual affected with AD tend to have coated hairy tongue, angular cheilitis, ulcerations, caries, periodontitis and finally tooth loss due to poor oral hygiene maintenance.

Due to improper oral hygiene the patients affected by AD tend to lose their teeth and have difficulty in eating. Within a period of time due to reduced intake of food they suffer from weight loss and are highly prone to systemic diseases. Hence rehabilitating such patients is very important as it can help them in restoring the functional chewing abilities.

This case report elaborates the rehabilitation of an Alzheimer's Disease patient using implant supported over denture.

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David Charles. P <sup>α</sup> & Anusha Sreedharan <sup>ο</sup>

## I. INTRODUCTION

**A**lzheimer's disease (AD) is a progressive degenerative disease that affects the cognitive skills of an individual. It is a type of dementia which causes difficulty in orientation, emotional instability, loss of abstract thinking, motor skills and personal care.

The common clinical symptoms of the disease are aphasia (loss of the ability to use speech and language), apraxia (loss of ability to perform learned and familiar movements), visual agnosia (inability to recognize familiar visual stimuli) and memory disorders<sup>1</sup>. The individual affected with AD tend to have coated hairy tongue, angular cheilitis, ulcerations, caries, periodontitis and finally tooth loss due to poor oral hygiene maintenance<sup>2</sup>.

Due to improper oral hygiene the patients affected by AD tend to lose their teeth and have difficulty in eating. Within a period of time due to reduced intake of food they suffer from weight loss and are highly prone to systemic diseases. Hence rehabilitating such patients is very important as it can help them in restoring the functional chewing abilities.

This case report elaborates the rehabilitation of an Alzheimer's Disease patient using implant supported over denture.

## II. CASE REPORT

A 68-years-old female was brought to our speciality dental clinic by her care taker with a chief complaint of completely missing upper and lower teeth and wanted replacement of the same as she was not able to chew her food properly and eat because of which she was mal-nourished. Patient had a past medical history of Alzheimer's disease and was under treatment for the same. Intraoral examination revealed multiple root stumps and grade three mobile teeth in the upper and lower jaw (fig-1). Patient had a pale oral mucosa with dark pigmentation in her tongue which was diagnosed as dark hairy tongue (fig-2).

Considering her past medical and dental history, patient was advised for a removable prosthesis

as she had difficulty in maintaining proper oral hygiene due to her illness. The patient and her care taker was explained elaborately the pros and cons of a conventional complete denture and also why it will be a better option for her than a fixed prosthesis.

Finally, an upper conventional complete denture and lower implant supported lower denture was decided after radiographic evaluation, as the patient wanted her lower denture to be more retentive. Patient was advised for complete extraction of the root stumps and mobile teeth in the maxilla and one root stump in the mandible to be removed at the time of implant placement. Following proper healing of the maxilla (fig-3) a maxillary primary and secondary impression was made.

Based on the patient's radiographic measurements implant placement was planned in the 33, 44 regions with implant diameter of 3.75mm and 13mm length (Genesis Implant) for both the regions and implant placement was done following medical fitness.

After 3 months, the implant site was opened and healing abutment was placed. Later implant level impression was made using open tray impression technique (fig-4) and jig tryin (fig-5) was done prior to the fabrication of the final frame. Later the male component was milled using Ti with two distal micro ball attachment and clip in the middle (fig -6,7). The frame was tried in patient's mouth and checked radiographically for precise fit (fig-8, 9). The counter female component was made and acrylicization was done using injection moulding technique (Ivoclar vivadent) (fig - 10). Finally, the denture was placed in the patient mouth and checked for the fit and occlusion (fig - 11, 12, 13, 14). The patient was given all the post denture placement instructions and the patients care taker was instructed to keep a check on the maintenance of the denture as per the instructions given. The patient was advised to report initially once in three months for evaluating the maintenance of the prosthesis for a year and later once in every six months.

## III. DISCUSSION

Primarily, in patients with Alzheimer's disease (AD) communicative and cognitive skill are affected so

they require a care taker to assist them in performing their day today task. In the above mentioned patient, considering the difficulties in oral hygiene maintenance the simplest and a best replacement option for her in comparison with other treatment options was a removable complete denture as the maintenance can easily be performed by a care taker even if the patient is unable to do the same. Difficulty in maintaining oral hygiene, ruled out the possibility of fixed prosthesis. Since the lower ridge was Atwood's order 5 type of ridge, achieving proper retention and stability was questionable. Based on the study by Laidlaw et al where he demonstrated in a case that the patients with AD usually tend to neglect mandibular dentures mainly due to its loss of retention<sup>3</sup>. Conventional mandibular dentures demonstrate problems with prosthesis stability and retention, with retention being the single most important problem<sup>4</sup>.

Hence, considering the possibility for compromised retention and stability in the lower denture patients was advised for an upper conventional removable complete denture and lower implant supported overdenture. Implants-supported overdentures have practical advantages over conventional complete dentures as it shows decreased bone resorption, reduced prosthesis movement, better esthetics and phonetics, improved occlusion, patient psychological outlook that improves the quality of life<sup>5</sup>. Feine and Carlsson advocated the 2-implant retained overdenture as the standard of care for the edentulous mandible in a consensus conference held in 2002<sup>6-8</sup>. The design of the mandibular over denture was made to have two distal micro balls and a clip in the anterior region combined in a single screw retained Ti metal bar frame.

The splinting of implants has always proved to have better load distribution, good dissipation of forces, less screw loosening and crestal bone loss in implants and there by increasing the success rate of the implant<sup>9</sup>. Wright et al. found that there is a low resorption rate (0.5 mm average bone loss) in 21 patients wearing overdentures supported by two implants and a bar in the mandible after a mean period of observation of 5 years<sup>10</sup>. Various studies concluded that the ball attachments are the best regarding soft tissue complications, and patient satisfaction. When comparing the load transfer and denture stability in mandibular implant retained over denture among ball, magnet, and bar attachments, the studies suggested that the use of ball attachment was advantageous in regards to optimizing stress and minimizing denture movement<sup>11</sup>. Incorporating all the above mentioned concepts a new design was made with the combination of a bar containing two micro balls and an anterior clip which can provide the combined benefits of bar, ball and clip retained prosthesis. In this case report, patient had several physical, emotional and social challenges,

which she had to overcome. With the use of this design, the patient was able to efficiently chew her food with improved retention in the lower denture and within few weeks she started to gain weight and that improved her self-confidence.

#### IV. CONCLUSION

Older adults with increasing population of Alzheimer's Disease need proper oral health care. Their improving life expectancy demands them a proper dental care. The above mentioned patient is one of the classical example with appreciable intraoral findings. This report shows how efficiently she was managed and rehabilitated.

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Figure 1



Figure 2

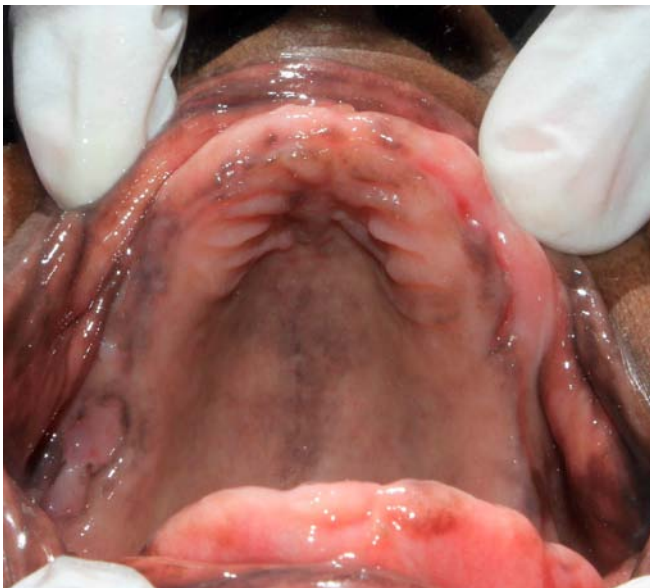


Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11





Figure 12



Figure 13



Figure 14