

ORIGINAL ARTICLE**Evaluation Of Efficacy Of Different Mandibular Implant Retained Overdenture With Different Loading Protocols: An Original Research**

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ABSTRACT:

Background: In modern dentistry implants play revolutionary role. Implant retained overdenture can be a simple treatment option to restore the edentulous mandible. Limitation such as severely resorbed jaw, unfavorable jaw relation and financial restriction sometimes prevent the placement of sufficient number of implant to accommodate a fixed prosthesis and therefore require an alternative for edentulous patients with compromised oral function. The basic concept of placing a limited number of implant to support an overdenture could be such an option. The aim of this study is to evaluate implant stability and marginal bone loss with different loading protocols. **Material and Methods:** A randomized control prospective study for 20 patients (13 males, 7 females) aged 45- 65 years old. Data were collected from patients records registered from November 2017 to December 2019. **Results:** The implant stability was more in the Early loading since for retention and stability may provide the better state-of-the-art results for all the overdentures when a patient is amenable to the additional procedures involved. **Conclusion:** Early Loading cases (i.e when loading done at 2 weeks with Complete mandibular denture) was more clinically efficient in comparison to Delayed loading cases (i.e when loading with complete mandibular denture done at 3 month).

Keywords: Implant, Overdenture, Early Loading, Delayed Loading

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INTRODUCTION

Implant dentistry has emerged as an excellent treatment modality ever since its ingress into the field of modern dentistry. However, the first and the foremost requirement for the placement of an implant is the presence of an adequate alveolar bone. The ideal goal of modern dentistry is to restore normal form, function and esthetic of oral cavity. Implant dentistry is unique because it is having the quality to fulfill all requirements for modern dentistry. The goal, however, is to extend this rehabilitative method to a large number of patients, including those with low quality and/or quantity of bone. In the past an adequate volume and low quantity of bone tissue were contraindicated to the implant treatment. By adequate bone, is meant that both the quality and quantity of the bone have to be sufficient for implant placement. Implant retained overdenture can be a single treatment option to restore the edentulous

mandible. In the absence of natural abutment as in edentulous patients, artificial substitutes called implant can be used to act as abutment to gain all advantages associated with overdenture. Implant can serve as substitutes for tooth root and help provides support and regent to overlying prosthesis and they are placed surgically in selected edentulous host bone site with prosthetic structure subsequently fitted into transepithelial post or abutment joined to the buried implant. The placement of multiple implant for fixed prosthesis has been shown to be a predictable method for long term treatment of edentulous patients. Limitations such as severely resorbed jaw, unfavourable jaw relation and financial restriction sometime prevents the placement of sufficient number of implant to support an overdenture. Lack of retention and stability of the mandibular denture is common problem amonged entulous denture wearers. Initially treatment with endosseous implant consisted

of the placement of two implant combination with a prosthesis, it proved quite successful. The purpose of this study is to compare the marginal bone loss and stability of two implant placed in canine-premolar region of mandibular arc hand loaded at different interval.

MATERIALS AND METHODS

A prospective comparatively clinical study was performed from 2017 to 2019 in 20 patients and 40 implants (7 female and 13 male) requiring prosthesis for edentulous mandibular arch followed by two implants placed in each patient in each group in the Department of Oral & Maxillofacial surgery. This study was conducted on adults from local population who were wearing conventional mandibular complete denture since 3-6 months and were not satisfied with the retention of complete denture, fulfilling all inclusive and exclusive criteria were included in this study. Patients prior to the commencement of implant surgery a detailed history of the patients was

carefully recorded and patients were appraised about the potential risks and benefits and an informed consent was obtained.

RESULTS

Postoperatively the following parameters were evaluated for determining the better adjunct for soft tissue healing and hard tissue healing in implant placement followed by loading procedure.

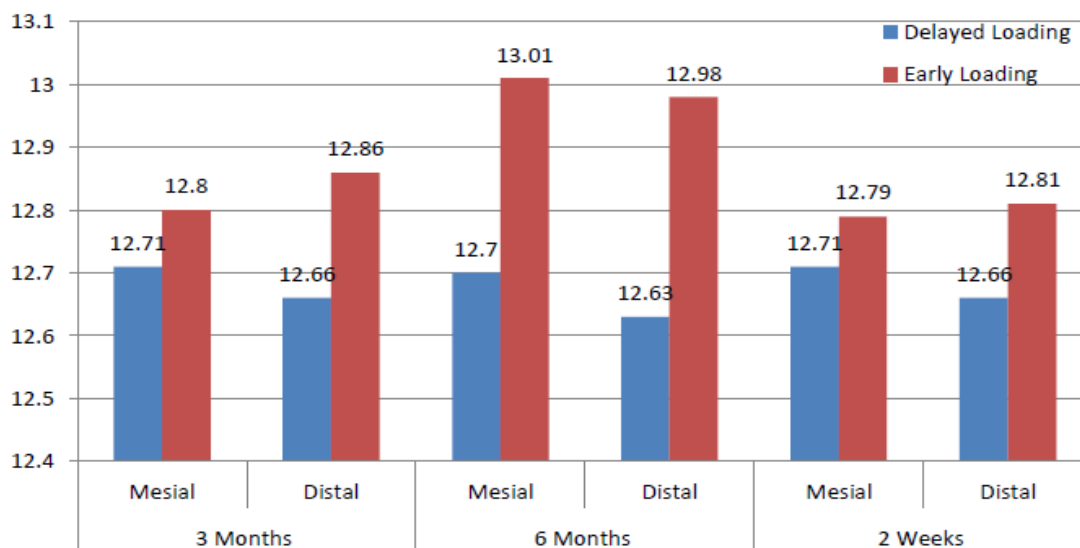
- Pain on Wong Bakers Face Pain rating scale on Day 1 and Day 7 after placement of Implant.
- Crestal bone loss checked post operatively at 2 week, 3 month and 6 month for Group A and at 3 month and 6 month for Group B, using Intra oral peri apical radiograph with grid.
- Implant stability checked post operatively at 2 week, 3 month and 6 month for Group A and at 3 month and 6 month for Group B, using Resonance frequency analyser and recording Implant stability quotient

INTERGROUP-GRIDIOPA

TABLE1: GRIDIOPA

| | | GP | Mean | Std.Deviation | PValue |
|----------|--------|-----------------|-------|---------------|--------------------|
| 3 Months | Mesial | Delayed Loading | 12.71 | 0.875 | 0.792 (Non-Sig) |
| | | Early Loading | 12.80 | 0.653 | |
| | Distal | Delayed Loading | 12.66 | 0.871 | 0.563 (Non-Sig) |
| | | Early Loading | 12.86 | 0.624 | |
| 6 Months | Mesial | Delayed Loading | 12.70 | 0.865 | 0.390 (Non-Sig) |
| | | Early Loading | 13.01 | 0.669 | |
| | Distal | Delayed Loading | 12.63 | 0.810 | 0.300 (Non-Sig) |
| | | Early Loading | 12.98 | 0.648 | |
| 2 Weeks | Mesial | Delayed Loading | 12.71 | 0.875 | 0.817 (Non-Sig) |
| | | Early Loading | 12.79 | 0.631 | |
| | Distal | Delayed Loading | 12.66 | 0.871 | 0.663 (Non-Sig) |
| | | Early Loading | 12.81 | 0.620 | |

GRAPH1: GRIDIOPA

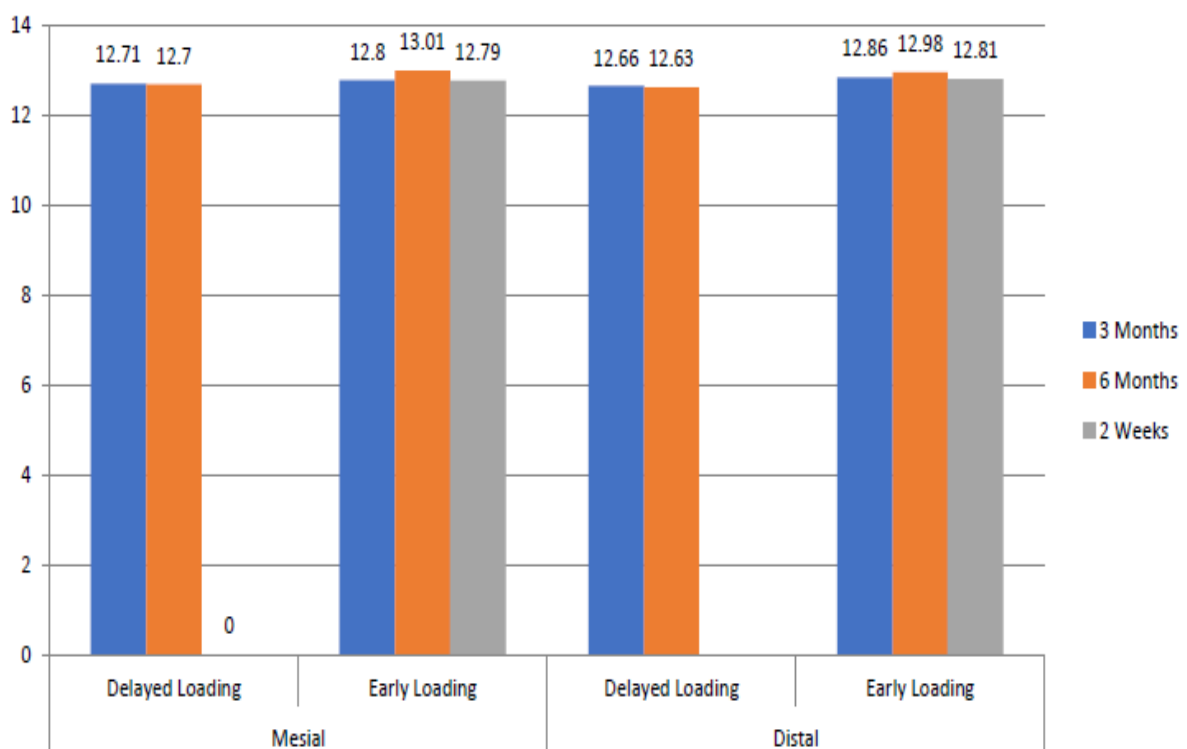


The intergroup comparison was made between the two implant systems at different time intervals using the independent t test at $p \leq 0.05$. The difference between the groups was found to be statistically non significant at all the three time intervals-3months, 6months and 2weeks on both mesial and distal sides.

TABLE2: INTRAGROUP-GRIDIOPA

| | GP | 3 Months | 6 Months | 2 Weeks | P Value |
|--------|-----------------|------------|------------|------------|--------------------|
| Mesial | Delayed Loading | 12.71±0.87 | 12.70±0.86 | - | 0.913 (Non-Sig) |
| | Arly Loading | 12.80±0.65 | 13.01±0.66 | 12.79±0.63 | 0.876 (Non-sig) |
| Distal | Delayed Loading | 12.66±0.87 | 12.63±0.81 | | 0.921 (Non-Sig) |
| | Early Loading | 12.86±0.62 | 12.98±0.64 | 12.81±0.62 | 0.679 (Non-Sig) |

GRAPH2: INTRAGROUP-GRIDIOPA

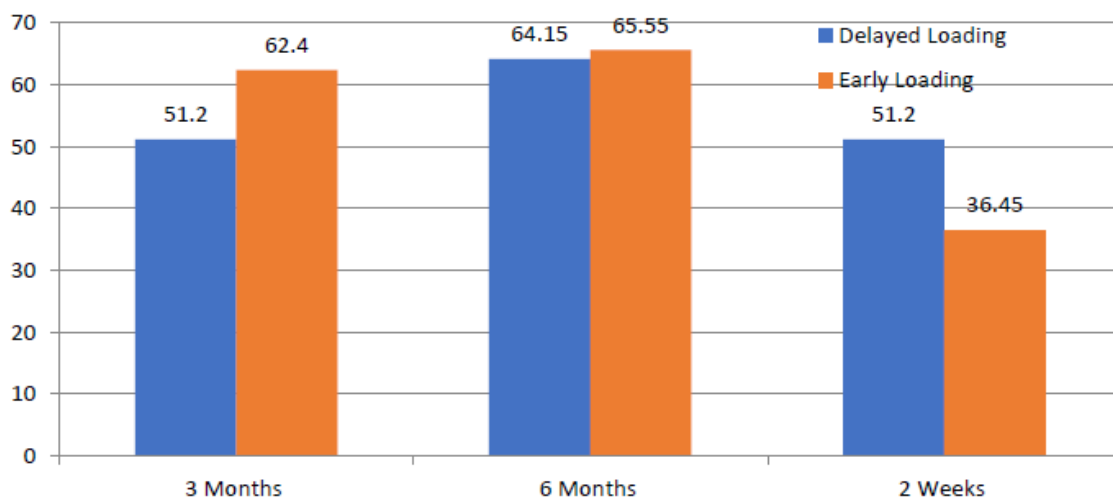


The intra group comparison was made between the different time intervals using paired t test and repeated measures ANOVA at $p \leq 0.05$. The intra group comparison between different time intervals was statistically non-significant for both the implant groups

TABLE 3: INTERGROUP RFA

| | GP | Mean | Std.Deviation | PValue |
|----------|-----------------|-------|---------------|--------------------|
| 3 Months | Delayed Loading | 51.20 | 17.71 | 0.070 (Non-Sig) |
| | Early Loading | 62.40 | 4.88 | |
| 6 Months | Delayed Loading | 64.15 | 3.46 | 0.225 (Non-Sig) |
| | Early Loading | 65.55 | 0.643 | |
| 2 Weeks | Delayed Loading | 51.20 | 17.71 | 0.091 (Non-Sig) |
| | Early Loading | 36.45 | 20.03 | |

GRAPH 3: INTERGROUP RFA

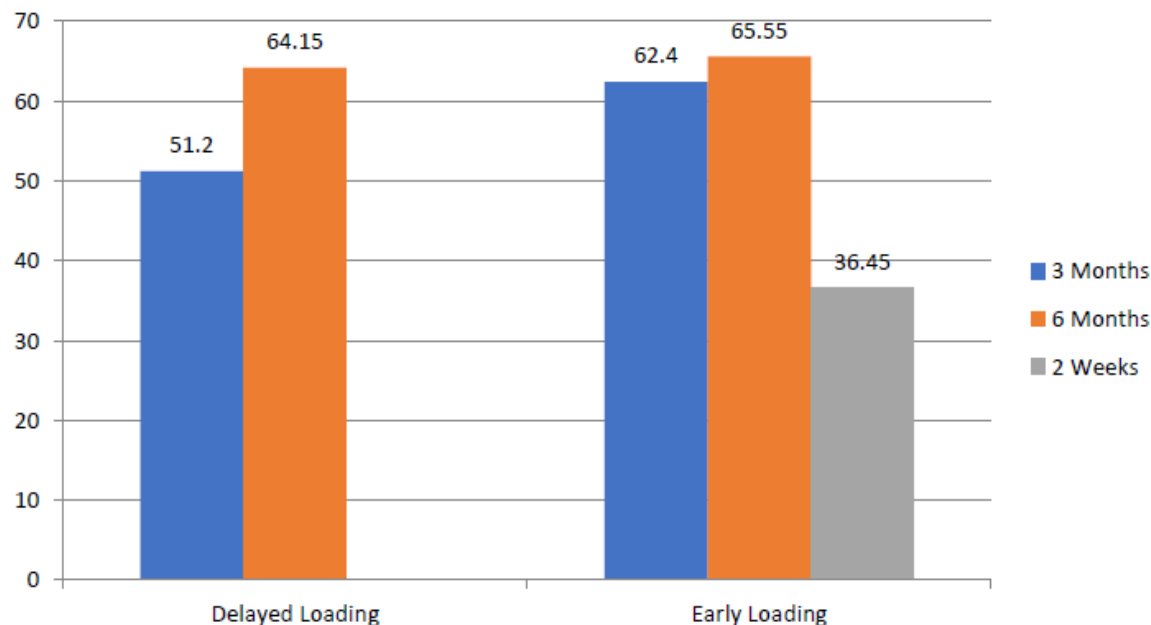


The intergroup comparison was made between the two implant systems at different time intervals using the independent t test at $p \leq 0.05$. The difference between the groups was found to be statistically non significant at all the three time intervals -3 months, 6 months and 2 weeks.

TABLE 4: INTRAGROUP RFA

| GP | 3 Months | 6 Months | 2 Weeks | PValue |
|-----------------|-------------|------------|-------------|---------------------|
| Delayed Loading | 51.20±17.71 | 64.15±3.46 | - | 0.012 (Sig) |
| Early Loading | 62.40±4.88 | 65.55±0.64 | 36.45±20.03 | 0.001 (significant) |

GRAPH 4: INTRAGROUP RFA



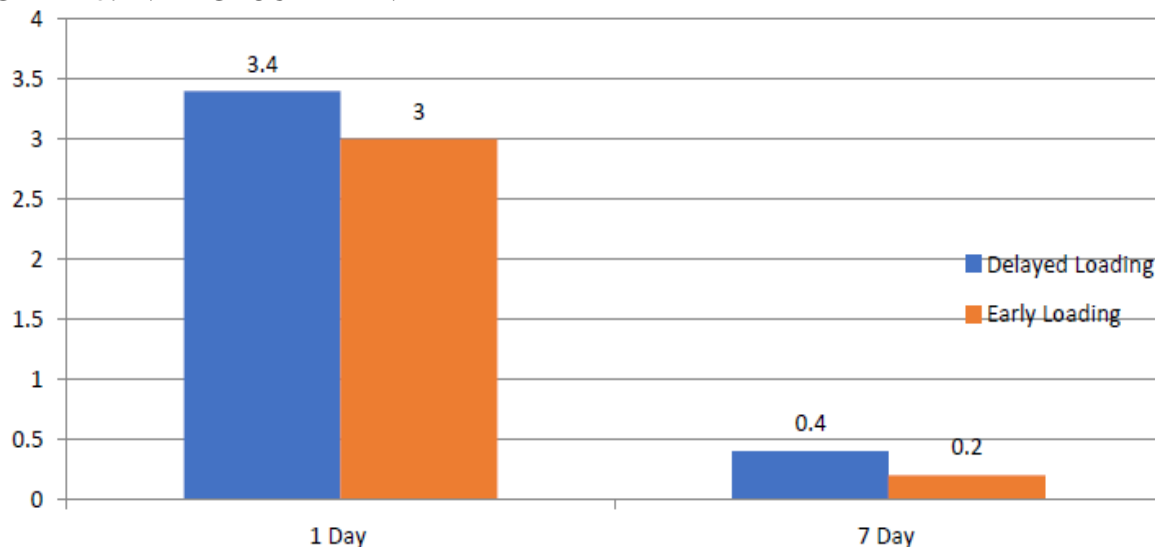
The intragroup comparison was made between the different time intervals using paired t test and repeated measures ANOVA at $p \leq 0.05$. The intragroup comparison between different time intervals was statistically - significant for both the implant groups

TABLE 5: INTERGROUP –PAIN

| | GP | Mean | Std.Deviation | PValue |
|------|-----------------|------|---------------|-----------------|
| 1Day | Delayed Loading | 3.40 | 0.966 | 0.388 (Non-Sig) |
| | Early Loading | 3.00 | 1.05 | |

| | | | | |
|------|-----------------|------|-------|--------------------|
| 7Day | Delayed Loading | 0.40 | 0.843 | 0.556 (Non-Sig) |
| | Early Loading | 0.20 | 0.632 | |

GRAPH 5: INTERGROUP – PAIN

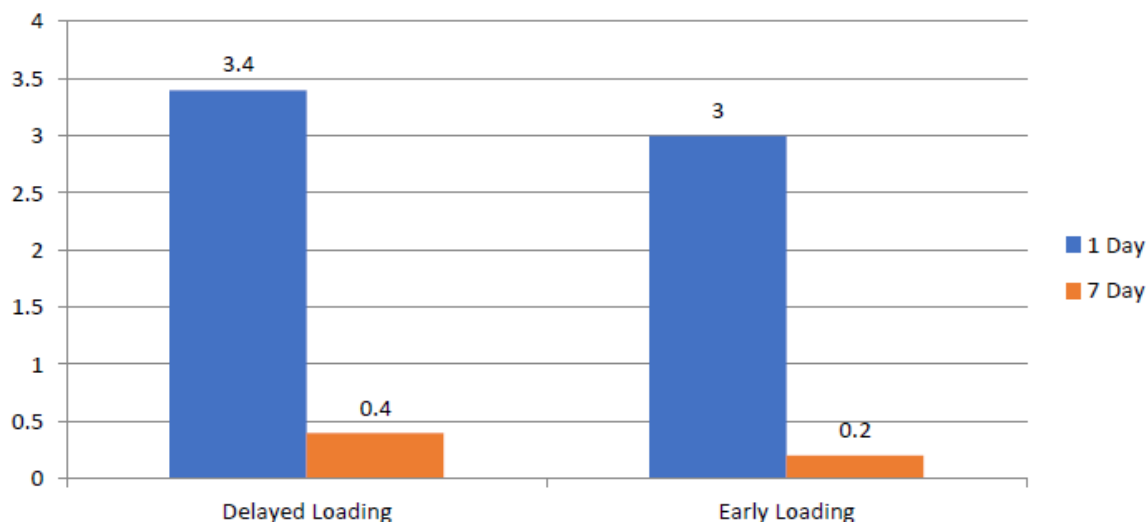


The intergroup comparison was made between the two implant systems at different time intervals using the independent t test at $p \leq 0.05$. The difference between the groups was found to be statistically non significant at all the three time intervals -1 day and 7 day on both mesial and distal sides

TABLE 6: INTRAGROUP-PAIN

| GP | 1Day | 7Day | PValue |
|-----------------|-----------|-----------|------------------------|
| Delayed Loading | 3.40±0.96 | 0.40±0.84 | 0.001 (Sig) |
| Early Loading | 3.00±1.05 | 0.20±0.63 | 0.001 (significant) |

GRAPH 6: INTRAGROUP-PAIN



The intragroup comparison was made between the different time intervals using paired t test at $p \leq 0.05$. The intragroup comparison between different time intervals was statistically significant for both the implant groups.

DISCUSSION

In our study, we clinically and radiographically evaluated the clinical efficacy of Implant supported mandibular overdenture comparing between Early Loading and Delayed Loading.

Implants in our study were loaded at 2weeks interval in Early loading cases and at 3month interval in Delayed loading cases. A total of 20 edentulous patients in mandibular arch with 40 implants were included in the study. Follow up was done at 2

weeks, 3 months and 6 months post implantation for Early loading cases and at 3 months and 6 months for Delayed loading cases. Patients post operative pain was clinically evaluated using Wong bakers face pain rating scale. Objective measurements of implant stability were made by Resonance frequency analysis. Radiographically marginal bone loss mesially and distally was done by using grid IOPA. The collected data was then analyzed statistically and compared in two groups. The objective measurements, the Early loading cases were found to be significantly improved than delayed loading cases. Bone loss and Stability was comparatively better with Early loading cases when compared to Delayed loading cases. Although pain is almost same in patients with both groups.

CONCLUSION

Since the clinical success and superiority of Early loading cases relative to Delayed loading cases is evident from the result of this study. Edentulism is the common problem that can be treated easily with implant supported overdenture thereby replacing the conventional complete denture. In our study we found that implant supported overdenture with early loading was more effective due to initial marginal bone loss was noticed followed by decreased bone loss and increased implant stability compare to delayed loading.

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