International Journal of Early Childhood Special Education (INT-JECSE)
DOI:10.9756/INTJECSE/V14I5.902 ISSN: 1308-5581 Vol 14, Issue 05 2022

A COMPARATIVE ANALYSIS OF IMMEDIATE VERSUS DELAYED MANDIBULAR IMPLANT-RETAINED OVERDENTURES

Dr. Darshana Mundhe[1],Dr.Neelam Gavali[2],Dr. Sai sindhu.V.K[3],Dr. Khaniya Bharathan[4],Dr. MD Meezan Ur Rahman[5],Dr. Shivani[6] ,

1. Assistant Professor, Department of Prosthodontics, BharatiVidyapeeth, Dental College and Hospital, Pune.
2. Assistant Professor, Department of Periodontology, BharatiVidyapeeth (Deemed to be) University Dental College & Hospital, Pune.
3. Senior lecturer/ assistant professor, Dept of OMFS, RVS Dental College And Hospital, saisindu_srisai@yahoo.com
4. Senior Lecturer ,Dept of Orthodontics , RVS Dental College, Coimbatore , drkhaniya@gmail.com
5. BDS, General Dentist, Hkdet'S Dental College, Hospital And Research Institute, Humnabad, Karnataka, drmeezanrahman@gmail.com
6. Senior lecturer department of Prosthodontics and crown & Bridge at Kalka Dental, College meerut, Uttar Pradesh , India docshivanisaran@gmail.com

Corresponding Author: Dr. Darshana Mundhe, Assistant Professor, Department of Prosthodontics, Bharati Vidyapeeth, Dental College and Hospital, Pune. eicijss@gmail.com

ABSTRACT

Background: The rehabilitation of edentulism has long been regarded as one of the main challenges for dentists. The present study was conducted to compare immediate versus delayed mandibular implant-retained overdentures.

Materials & Methods: 60 mandibular edentulous patients were divided into 2 groups of 30 each. In group I, patients received delayed loading and in group II, patients received immediate loading of dental implants. Parameters such as bone loss around implants, periodontal pocket depth, pain and discomfort were measured immediately and after healing period of 3 and 6 months.

Results: The mean PPD (mm) was 4.26 in group I and 5.47 in group II at baseline, 3.23 in group I and 4.32 in group II at 3 months and 3.24 in group I and 3.61 in group II at 6 months. The mean crestal bone loss at 0 month was 0 mm in both groups, at 3 months was 1.4 mm in group I and 1.8 mm in group II and at 6 months was 0.61 mm in group I and 0.82 mm in group II. In group I, mean pain and discomfort value was 2.94 and in group II was 3.20 at 0 month. It was 1.38 and 1.02 in in group I and group II at 3 months respectively and 0.43 in group I and 0.85 in group II at 6 months. The difference was non- significant (P> 0.05).

Conclusion: Immediate loaded implants exhibited inferior results as compared to delayed loading of mandibular implant.

Key words: Dental implants, Immediate loaded, osseo-integrated implants

Introduction

The rehabilitation of edentulism has long been regarded as one of the main challenges for dentists.[1] Conventional complete dentures may present some limitations such as insufficient retention and poor comfort, especially in the severely atrophic mandible. With the wide application of osseo-integrated implants, implant-retained overdentures have been introduced as a viable alternative to conventional complete dentures.[2]

Severely atrophic mandibles restored by conventional dentures has often many complications such as retention, phonetic, functional, and instability.[3] The use of dental implants has been suggested as a successful treatment to restore edentulous jaws with fixed partial dentures, hybrid prosthetics, and removable overdentures.[4] In the early years of mandibular overdenture therapy, 4 inter-foraminal implants were used with splinted bar. But over the years, the use of two un-splinted implants with solitary attachments has proved as effective as the multiple splinted implants.[5] Long-term outcomes of implant-retained overdentures are greatly affected by the longevity and functionality of the underlying implants, and the osseointegration is considered as the most important determinant of implant success.[6] Marginal bone loss (MBL), measured as the bone loss from the implant neck to the first bone-to-implant contact, is recognized as a crucial consideration for the attainment and maintenance of implant osseointegration.[7,8] The present study was conducted to compare immediate versus delayed mandibular implant-retained overdentures.

Materials & Methods

The present study consisted of 60 edentulous mandibular patients of both genders. The consent was obtained from all patients.Data such as name, age, gender etc. was recorded. A thorough oral examination was done. Patients were divided into 2 groups. Each group had 30 patients. In group I, patients received delayed loading and in group II, patients received immediate loading of dental implants. At 3 months and 6 months, bone loss around implants, periodontal pocket depth, pain and discomfort, were measured immediately and after healing. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Periodontal pocket depth (mm) around implants

Time period	Group I	Group II	P value
0 month	4.26	5.47	0.01
3 months	3.23	4.32	0.03
6 months	3.24	3.61	0.08

Table I, graph I shows that mean PPD (mm) was 4.26 in group I and 5.47 in group II at baseline, 3.23 in group I and 4.32 in group II at 3 months and 3.24 in group I and 3.61 in group II at 6 months. The difference was significant (P< 0.05).

Graph IPeriodontal pocket depth (mm) around implants

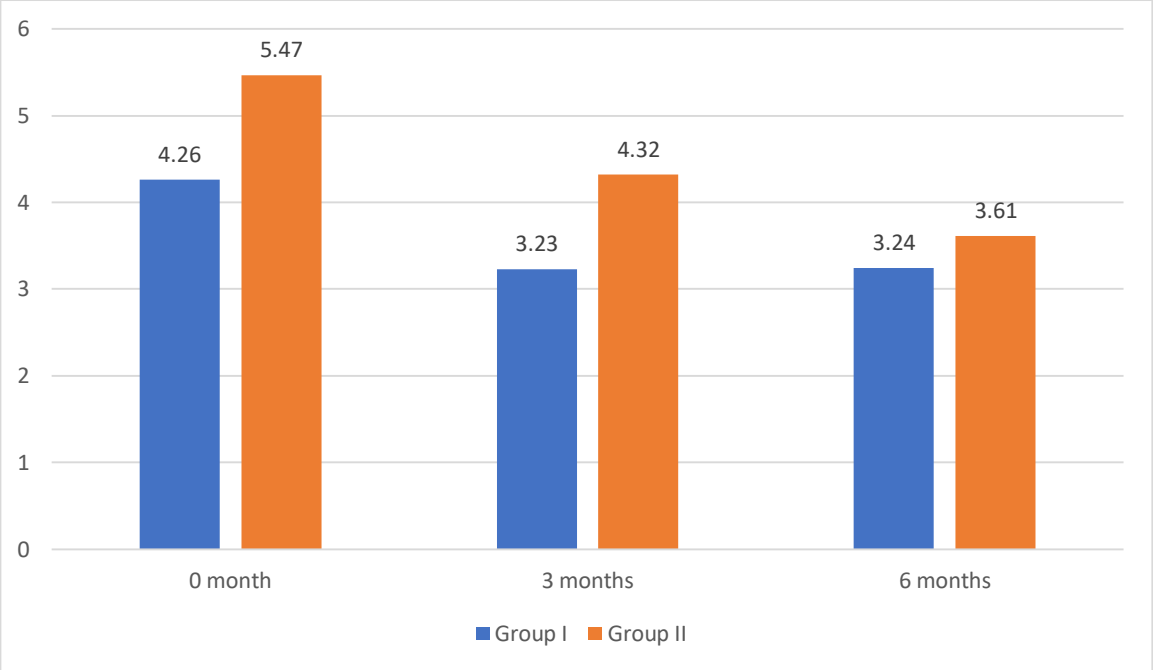

Table II Measurement of crestal bone loss (mm)

Time period	Group I	Group II	P value
0 month	0.0	0.0	0
3 months	1.4	1.8	0.81
6 months	0.61	0.82	0.92

Table II, graph II shows that mean crestal bone loss at 0 month was 0 mm in both groups, at 3 months was 1.4 mm in group I and 1.8 mm in group II and at 6months was 0.61 mm in group I and 0.82 mm in group II. The difference was significant (P< 0.05).

Graph I Measurement of crestal bone loss (mm)

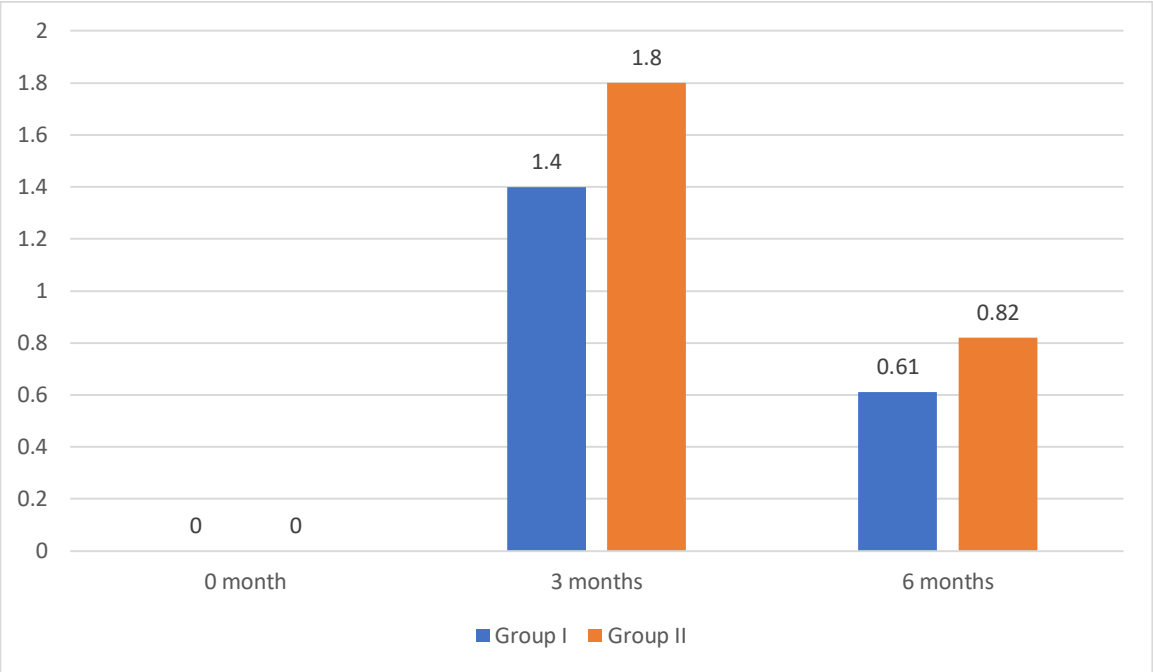

Table III Comparison of pain & discomfort

Time period	Group I	Group II	P value
0 month	2.94	3.20	0.05
3 months	1.38	1.02	0.94
6 months	0.43	0.85	0.81

Table III shows that in group I, mean pain and discomfort value was 2.94 and in group II was 3.20 at 0 month. It was 1.38 and 1.02 in in group I and group II at 3 months respectively and 0.43 in group I and 0.85 in group II at 6 months. The difference was non- significant (P> 0.05).

Discussion

Several studies reported that the initial healing of implants with immediately loaded mandibular overdentures might be impaired by the resultant restoration movement, immediate abutment connection, and early contact with oral microbial plaque.[9,10,11] The present study was conducted to compare immediate versus delayed mandibular implant-retained overdentures. We found that mean PPD (mm) was 4.26 in group I and 5.47 in group II at baseline, 3.23 in group I and 4.32 in group II at 3 months and 3.24 in group I and 3.61 in group II at 6 months. Galindo-Moreno et al[12] found that the progression of MBL tends to be higher and the risk of implant failure could be significantly increased when the rates of MBL was higher than 0.44 mm at six months post-loading. The new index may better help dentists predict future bone changes in the early stage and then establish a strict maintenance recall for patients. Meanwhile, a more definite evaluation of clinical outcomes between these two different loading protocols could be carried out in a short observation time rather than a minimum follow-up of one year. Tus, the rate of MBL might be a more suitable criterion for implant success in the clinic.We found that mean crestal bone loss at 0 month was 0 mm in both groups, at 3 months was 1.4 mm in group I and 1.8 mm in group II and at 6 months was 0.61 mm in group I and 0.82 mm in group II. Salman et al[13] assessed outcomes of immediately and delayed loaded two un-splinted implants, supporting a locator-retained mandibular overdenture. 23 of the 30 patients were available for the 60-month follow-up. The mean radiographic bone level change measured using standardized periapical radiographs from baseline to 60 months was 0.89 mm (±0.74) and 0.18 for delayed loading and immediate loading groups, respectively. A statistically significant difference was observed at 60 months with a smaller radiographic bone level change in the immediate loading group. No implants were lost between 12 and 60 months. At 60 months, per-protocol implant survival rate was 100% for both the groups. No difference was found in the peri-implant soft tissue parameters and prosthetic needs between the groups.We observed that in group I, mean pain and discomfort value was 2.94 and in group II was 3.20 at 0 month. It was 1.38 and 1.02 in in group I and group II at 3 months respectively and 0.43 in group I and 0.85 in group II at 6 months. Singh et al[14] compared outcomes of immediate loading of

mandibular two-implant-retained overdenture and compare it with the conventional delayed loading concept. A total of 20 completely edentulous patients (10 delayed loading and 10 immediate loading) were included in the study and certain parameters, i.e., bone loss around implants, periodontal pocket depth, pain and discomfort, implant stability, and microflora around implants, were measured immediately and after healing period of 3 and 6 months. Patients were more satisfied with delayed loading in terms of comfort, speech, function, pain, and chewing efficiency as compared to immediate loading.Naert et al[15]reported in their 10-year randomized clinical study that the ball group scored best in relation to retention and patient satisfaction for overdenture patients.

Conclusion

Authors found that immediate loaded implants exhibited inferior results as compared to delayed loading of mandibular implant.

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