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# IMPACT OF TREATED PERIODONTITIS HISTORY ON PRIMARY STABILITY AND EARLY COMPLICATIONS OF IMMEDIATE DENTAL IMPLANTS: A COMPARATIVE CLINICAL STUDY

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**ABSTRACT**

**Introduction:** The use of dental implants has revolutionized modern dentistry as now we have the ability to replace missing tooth structure without damaging or involving adjacent teeth. This also provides an option for fixed prosthesis in edentulous regions. The aim of the study is to answer the frequently debated question whether implant therapy in individuals with previous periodontitis associated tooth loss is associated with an increased incidence of implant loss and periimplantitis. Taking into account the lack of data available on local population in this regard the purpose is to have a better understanding of outcomes of implant therapy in this patient population.

**Objective:** To determine immediate implant stability in patients requiring replacement of one or more teeth and to compare immediate implant stability in patients with and without history of treated periodontitis.

**Subject and methods:** Descriptive Case Series conducted in Dental Department, Pakistan Institute of Medical Science (PIMS) Islamabad from June 2019 to June 2021. Screening of patients was done by history taking, clinical examination and radiographic evaluation of bone of the jaw. Patients filled into group A (with no history of periodontitis) and group B (with previous history of periodontitis). After the pre-surgical preparation for the placement of the implants, the surgery was conducted under aseptic conditions. The corresponding drilling was performed using a physio dispenser with torque control handpiece with abundance of Normal Saline irrigation, and the drilling speed and the initial torque used for the insertion of the dental implants was recorded. After finishing the surgical procedure, periapical radiographs were taken of the area. Patients of both groups were kept at 6 week and 3 months follow up. At each follow up visit clinical evaluation of the primary implant stability was done.

**Results:** In Group A, 04 (13.3%) patients had foreign body sensation while in Group B, 15 (50%) patients were having foreign body sensation. In Group A, 04 (13.3%) patients were recorded with dysesthesia while in Group B, 10 (33.3% patients were recorded with dysesthesia. In Group A, 07 (23.3%) patients experienced pain while in Group B, 21 (70.0%) patients experienced pain.

**Conclusion:** Based on the outcomes of the present study, it can be concluded that immediate implant placement with immediate loading may be a viable treatment option for cases requiring earliest restoration of teeth to be

extracted. However, this approach is considered highly technique sensitive and requires expert dental implant team for its execution. Careful selection of cases,
proper treatment plan and follow-up of surgical and prosthetic protocols are the keys to success.

**Keywords:** Immediate implant placement, Complications of immediate placement, Techniques for immediate placement, Prevention of complications

## INTRODUCTION

The field of implant dentistry has witnessed remarkable progress over recent decades, evolving into a dependable solution for patients with missing teeth. Dental implants not only restore function but also improve esthetics and oral health-related quality of life. One of the most compelling advantages of implant therapy is its ability to replace missing teeth without compromising adjacent structures, making it preferable over conventional prosthodontic options like bridges and dentures. As a fixed solution in edentulous spaces, implants ensure better masticatory function, patient comfort, and bone preservation.[1]

The concept of osseointegration, introduced by Branemark in the 1960s, laid the foundation for modern implantology. This biological process allows for a direct functional and structural connection between the implant surface and surrounding bone, which is critical for implant success. With technological advancements, the success rates of implants have continued to improve, with studies reporting rates exceeding 90% over a span of 10–15 years. Despite these advancements, implant failure due to biological and mechanical complications remains a concern, especially in patients with a compromised periodontal history.[2] Periodontal disease, particularly chronic periodontitis, is the leading cause of tooth loss in adults. It causes irreversible damage to the periodontal ligament and alveolar bone, compromising the foundation required for natural teeth and potentially for implants. Although periodontal disease can be treated and brought under control, the structural damage and immune response alterations associated with the disease may persist and influence subsequent dental treatments, including implant placement. Thus, the history of periodontitis is an essential consideration in treatment planning for implants.[3]

A growing number of patients receiving implants have a background of periodontal disease, making it imperative to understand the clinical outcomes in such populations. Several studies have demonstrated a correlation between previous periodontitis and increased implant complications, such as peri-implantitis, implant mobility, and bone loss. Zitzmann et al. highlighted that individuals with a history of periodontitis are nearly six times more likely to develop peri-implantitis compared to those with healthy periodontal status. However, contrasting results from long-term studies indicate that with proper management and follow-up, implants in periodontally compromised patients can also show high survival rates.[4]

In the local context, particularly in developing countries like Pakistan, data regarding implant success and associated complications in patients with periodontal history remains scarce. With varying oral hygiene practices, socioeconomic conditions, and access to dental care, localized studies are essential to draw context-specific conclusions.[5]

This study was conducted to bridge this knowledge gap and provide clinicians with evidence-based guidance on implant outcomes in patients with and without prior periodontitis. It focuses on assessing the immediate primary stability of implants and evaluating post-operative complications such as pain, mobility, and neurosensory disturbances in both patient groups.

## MATERIALS AND METHODS

This descriptive case series was conducted in the Dental Department of Pakistan Institute of Medical Sciences (PIMS), Islamabad, over two years from June 2019 to June 2021. A total of 60 patients were selected through consecutive non-probability sampling. Thirty patients with no history of periodontitis were placed in Group A, and thirty with treated periodontitis formed Group B. Inclusion criteria included patients aged 18 to 50 years requiring implant therapy with good oral hygiene and complete healing in Group B. Exclusion criteria included systemic diseases, poor oral hygiene, active periodontitis, or parafunctional habits.

All patients underwent clinical examination and radiographic evaluation before the surgical procedure. Implant placement was carried out under aseptic conditions using a torque-controlled physio dispenser and normal saline irrigation. Initial torque was recorded to assess primary stability. Postoperative follow-ups were scheduled at 6 weeks and 3 months to evaluate for implant mobility, foreign body sensation, dysesthesia, and pain.

## RESULTS

Initial torque values were identical in both groups, averaging 32.00 Ncm. Most patients in both groups were over 40 years of age. Male to female ratio was also consistent across groups (56.7% males, 43.3% females). Postoperative complications, however, were notably higher in Group B. Tooth mobility was present in 23.3% of Group A and 56.7% of Group B. Foreign body sensation was reported in 13.3% of Group A and 50% of Group B. Dysesthesia was experienced by 13.3% in Group A and 33.3% in Group B. Pain complaints were 23.3% in Group A versus 70% in Group B.

Table 1 presents the average age and initial torque values in both groups. Notably, the initial torque was identical (32.00 Ncm), indicating comparable mechanical implant stability at the time of placement.

**Table 1: Descriptive Statistics**

| Group | Age (Mean ± SD) | Initial Torque (Mean ± SD) |
|---|---|---|
| A | 44.50 ± 2.968 | 32.00 ± 0.00 |
| B | 44.50 ± 2.968 | 32.00 ± 0.00 |

Table 2 provides a comprehensive overview of patient demographics and implant site distribution. The data reveals that the majority of patients in both groups were above 40 years of age. Gender distribution was balanced with a slightly higher proportion of males. The maxilla was the more common site for implant placement across both groups.

**Table 2: Demographic and Implant Site Distribution**.

| **Variable** | **Category** | **Group A (n = 30)** | **Group B (n = 30)** |
|---|---|---|---|
| **Age Group** | < 40 yrs | 4 (13.3%) | 4 (13.3%) |
| | > 40 yrs | 26 (86.7%) | 26 (86.7%) |
| **Gender** | Male | 17 (56.7%) | 17 (56.7%) |
| | Female | 13 (43.3%) | 13 (43.3%) |
| **Implant Site** | Maxilla | 19 (63.3%) | 19 (63.3%) |
| | Mandible | 11 (36.7%) | 11 (36.7%) |

Table 3 highlights the incidence of various postoperative complications observed in the study. It is evident that Group B (patients with a history of treated periodontitis) experienced significantly higher rates of complications, including mobility, foreign body sensation, dysesthesia, and pain, compared to Group A. This suggests a greater biological susceptibility in patients with previous periodontal disease, even after treatment.

**Table 3: Postoperative Complications**

| **Complication** | **Group A (n = 30)** | **Group B (n = 30)** |
|---|---|---|
| **Mobility** | 7 (23.3%) | 17 (56.7%) |
| **Foreign Body Sensation** | 4 (13.3%) | 15 (50.0%) |
| **Dysesthesia** | 4 (13.3%) | 10 (33.3%) |
| **Pain** | 7 (23.3%) | 21 (70.0%) |

## DISCUSSION

The findings of this study emphasize the influence of a prior history of periodontitis on early implant outcomes. Despite achieving equivalent primary stability at the time of surgery, patients in Group B exhibited significantly higher rates of postoperative complications. These findings align with the broader literature indicating that treated periodontitis patients remain at a higher biological risk even after clinical resolution of the disease.

Immediate implant placement offers numerous benefits, including reduced treatment time, preservation of alveolar bone, and improved patient satisfaction. However, it also demands meticulous case selection and surgical precision. For patients with prior periodontal disease, underlying changes in bone morphology, immune response, and microbial environment may predispose them to complications despite successful initial

integration.[6] Numerous studies have shown similar trends. For instance, a long-term study indicated that while 71.4% of implants in periodontitis patients remained complication-free, the rate was higher (94.2%) in those without prior periodontal issues. The increased incidence of pain, neurosensory disturbances, and mobility seen in Group B of the current study supports the hypothesis that a history of periodontitis, even when treated, creates a susceptible peri-implant environment.[7-9] Additionally, post-surgical complaints like foreign body sensation and dysesthesia may be attributed to altered sensory feedback or minor nerve involvement, which could be more pronounced in compromised sites. Moreover, pain could indicate a subclinical inflammatory process or early signs of peri-implantitis, which necessitates proactive monitoring.[10]

Similar results were reported by Zitzmann et al.[4], who observed a sixfold increased risk of peri-implantitis in patients with a history of periodontitis. This study mirrors our findings, particularly with respect to pain, dysesthesia, and implant mobility, which were significantly more common in Group B. Moreover, in a long-term study referenced in the thesis document, 71.4% of implants in periodontitis patients remained free from complications, in contrast to 94.2% in healthy individuals. This discrepancy further underscores the biological susceptibility of previously affected patients.

Overall, the results suggest that while immediate implant placement is technically feasible and mechanically stable in patients with treated periodontitis, clinicians must anticipate a higher risk of biological complications. Strict maintenance protocols, patient education, and possibly adjunctive antimicrobial or regenerative therapies may be warranted in such cases. The strength of this study lies in its prospective comparative design and localized focus. However, limitations include a relatively small sample size and short follow-up duration. Future research should explore long-term outcomes and integrate advanced imaging and biomarker analysis to better understand biological responses in periodontally compromised implant patients.

## CONCLUSION

Immediate implant placement with immediate loading appears to be a viable option for patients requiring quick restoration of missing teeth. However, in patients with a history of periodontitis, even when fully treated, the risk of postoperative complications such as pain, dysesthesia, and mobility is higher. Careful patient selection, expert surgical technique, and regular follow-up are critical to ensure long-term success.

**Conflict of Interest:** None

**Authors' Contribution**

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