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Dentistry

IMMEDIATE IMPLANT LOADING: A VIABLE OPTION FOR MANDIBULAR ARCH RESTORATION- A CASE REPORT.

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ABSTRACT Tooth loss, deeply impacting one's identity and social well-being, has traditionally been addressed with removable dentures, fixed bridges, or complete dentures. Recent advancements in dental implants have introduced immediate implant loading, where the prosthesis is attached on the same day as implant placement, offering a faster and more aesthetically pleasing alternative to traditional methods that require a healing period. This case report details the application of immediate loading in a 75-year-old male patient who presented with compromised periodontal conditions and missing lower posterior teeth. The patient underwent extraction of remaining teeth, implant placement, and immediate temporization using a mandibular "All-on-6" system. Preoperative CBCT confirmed adequate bone quality and quantity, allowing for the use of seven implants to avoid distal cantilever issues. The immediate loading protocol provided benefits including reduced treatment time, enhanced patient satisfaction, and preservation of soft and hard tissues. However, successful outcomes require precise surgical technique, careful patient selection, and meticulous prosthetic planning. Although immediate loading offers transformative potential in dental restoration, it demands a high level of expertise and careful case management to ensure optimal results.

KEYWORDS : Dental implants, immediate loading, rehabilitation.

INTRODUCTION

Tooth loss can deeply impact one's identity and self-esteem, with a smile often seen as a key expression of personality. [1] Such a loss is not merely a physical change but a significant emotional and social challenge that requires substantial adjustment. Traditionally, missing teeth have been addressed with removable partial dentures, fixed bridges, or complete dentures for those who are fully edentulous.[2] However, advancements in dental implant technology, spurred by the quest for more natural-looking and faster solutions, have revolutionized tooth replacement options.

Since the introduction of osseointegration by Branemark in 1977,[4] dental implant protocols have evolved dramatically. The focus has shifted towards techniques that offer greater patient comfort, improved aesthetics, and shorter treatment times. One notable advancement is immediate implant loading, a method where the prosthesis is affixed to the implants on the same day as their placement. This approach contrasts with traditional methods that require a healing period before the prosthesis is attached.[3]

Immediate implant loading provides numerous advantages, including reduced overall treatment time, enhanced patient satisfaction, and preservation of both soft and hard tissues. It also offers psychological benefits by minimizing the time patients spend without teeth and reducing the number of dental visits required. However, it is essential to recognize that this technique is not universally applicable. Successful implementation of immediate loading demands careful patient selection, precise surgical technique, and detailed prosthetic planning to ensure optimal results.[4,5]

CASE REPORT:

A 75 years male visited to our institution with the complaint of missing teeth in lower posterior region and he wanted to get them replaced.

On examination it was found that there was fixed partial denture in mandibular anterior region where both the canines (# 22 and #27 , Universal system) were used as abutments #18, #30, #31 were missing and the teeth remaining were #28, #29, #19 #20. All the remaining teeth as well as the teeth used as abutment were found periodontally compromised and there was mobility seen. Hence, the patient was suggested to rehabilitate whole of the mandibular arch.

The patient was explained with all the treatment modalities and he willingly accepted the implant placement procedure.

On examining the CBCT of the patient it was found that there was ample amount of bone available and the quality of the bone was also good and patient was not bruxer immediate temporization was planned.

Informed written consent was taken from in patient.

Implant placement surgery:
Local anesthesia (1:80000 Lignocaine hydrochloride with adrenaline) was administered . Extraction of the remaining teeth was done. (Figure 1)

Crestal incision followed by full thickness mucoperiosteal flap was raised.(Figure 2) Osteoplasty was performed to create an even and concave ridge, which enhances the emergence profile (see Figure 3). Implants were placed in all the necessary zones, with a total of seven implants inserted in the lower arch. This decision was made due to the periapical infection and bony defect in the 43 region, as well as the patient's large jaw size, which necessitated the use of seven implants to avoid a distal cantilever. After implant placement, primary stability was assessed and found to be excellent. The alignment of the implants was verified, and multiunit abutments with the required angulation were installed. The procedure was concluded with suturing. (Figure 4,5)

Immediate temporization:
Two different options are available for immediate occlusal loading for completely edentulous patient desiring a fixed prosthesis
a. First option- loads the implants the same day as the surgery.

b. Second option- is to place implants & make an impression at surgery.

Then at the suture removal appointment 7 to 12 days later, the dentist delivers the transitional fixed prosthesis.

We have undertaken the first option.
Multiunit impression copings were placed on the implants and

splinting was done using pattern resin in order to minimize movement when removing the impression from the mouth and when attaching laboratory analogs to the impression posts. (Figure 6) Impression was made using elastomeric impression material and model was poured. (Figure 7)

Tentative jaw relation was recorded followed by teeth arrangement and try in. (Figure 8)

Metal bar trial was done to check the passivity of the prosthesis.(Figure 9,10) Final prosthesis delivery was done. On the metal bar with passive fit hybrid acrylic prosthesis was placed. (Figure 11)

Figure 1. Extraction of the remaining tooth

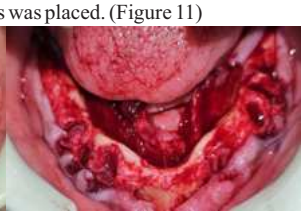

Figure 2. Incision and flap reflection

Figure 3. Osteoplasty done

Figure 4. Implant placement follwed by multiunit abutment placement

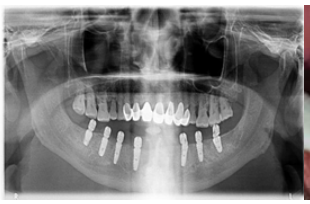

Figure 5. Post operative radiograph

Figure 6. Impression coping placement and splinting done

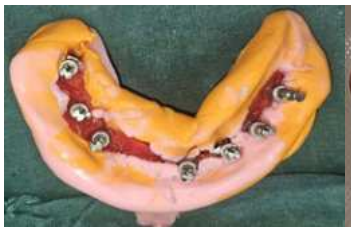

Figure 7: Impression made using elastomeric impression material.

Figure 8: Try in denture

Figure 9: Metal bar trial

Figure 10. Final Prosthesis

DISCUSSION:

Immediate implant loading marks a significant evolution in implant dentistry, driven by a growing demand for faster treatments, greater comfort, and improved aesthetics from patients.[4] This approach offers substantial benefits but also introduces challenges that need careful attention.

A primary advantage of immediate loading is the reduction in overall treatment time. Traditional implant methods require a healing period for osseointegration, where the bone bonds with the implant.[5] The technique developed by Malo et al. in 2003 [11] and refined in 2011 [12] adheres to the gold standards established by Professor Branemark. Their evidence-based 5-step protocol outlines the minimum number of implants needed to support a fixed prosthesis in the mandible or maxilla effectively.

At the First P-I Branemark Scientific Symposium in Gothenburg in 2009,[13] Dr. Branemark discussed the limits of advanced methods and emphasized the need for simplified, reliable procedures. He advocated for minimalist approaches, highlighting that fewer anchoring elements can achieve effective results without causing undue stress on the bone tissue, which is essential for function.

Regarding full-arch immediate loading in mandibles, studies show promising results. Grunder [6] reported that 72.5% of immediate implants were successful, while Cooper et al.[7] achieved a 100% success rate, demonstrating high efficacy across different implant types and conditions.[6][7] Gallucci et al.[8] recommended removing provisional prostheses to assess implant stability and soft tissue condition during healing. Conversely, Tarnow et al.[9] identified failures related to early prosthesis removal. Balshi et al [10]. found that ISQ values decreased from surgery day to the third month, advising against the removal of provisional prostheses during the initial two months.

Testori et al [14] stated that in the maxilla immediate placement and immediate loading may significantly increase the failure rate but in the mandible the use of immediate implants and immediate loading shows no similar increase 4 years after loading. This might, therefore, suggest that in the maxilla delayed loading should have been taken into consideration when immediate implants were placed. Despite the fact that survival is lower in the maxilla, this investigation showed no statistically significant differences between the arches, and therefore maxillary full-arch implants could be an effective technique.

Immediate loading, where the prosthesis is attached on the same day as implant placement, represents a significant advancement in dental restoration. It offers numerous advantages, including reduced treatment time, enhanced patient satisfaction, and preservation of soft and hard tissues. This technique allows for near-instant functional and aesthetic restoration, profoundly improving patients' quality of life.

However, successful immediate loading depends on several critical factors. These include precise surgical technique, careful patient selection, and detailed prosthetic planning. Candidates must have adequate bone quality and quantity, and their overall oral and systemic health must be considered. Achieving primary implant stability is crucial for successful osseointegration under immediate loading conditions. Additionally, the prosthetic design must be optimized to evenly distribute occlusal forces, preventing overload during the critical healing period.

CONCLUSION

The case report highlights the transformative potential of immediate implant loading in dental implantology, offering patients quicker, more comfortable, and aesthetically satisfying outcomes. However, it also emphasizes the critical need for meticulous case selection, advanced surgical expertise, and detailed prosthetic planning to achieve successful results. As implant technology and materials continue to advance, immediate loading could become a more accessible option for a wider range of patients, further establishing its role in contemporary dental practice.

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