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### RESEARCH ARTICLE

## COMPARATIVE EVALUATION OF DFDBA AND PRF PLUG IN SOCKET PRESERVATION: A CASE REPORT

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### Abstract

Following tooth extraction, progressive alveolar bone resorption may compromise future implant placement by creating prosthetic and surgical difficulties. Lower left premolars considered are irreparable in this case report. A conservative tooth extraction was performed. Preservation of socket was then performed with PRF PLUG AND DFDBA ALLOGRAFT respectively in each socket and collagen plug was placed over it and sutured. CBCT analysis was done after 45 DAYS and 90 DAYS of healing period for evaluating the regeneration in the grafted site. It could be concluded that decreased alveolar bone resorption was observed following the process of "Socket preservation."

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### Introduction:-

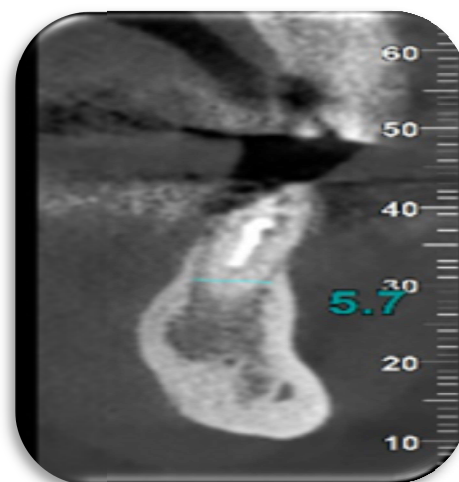
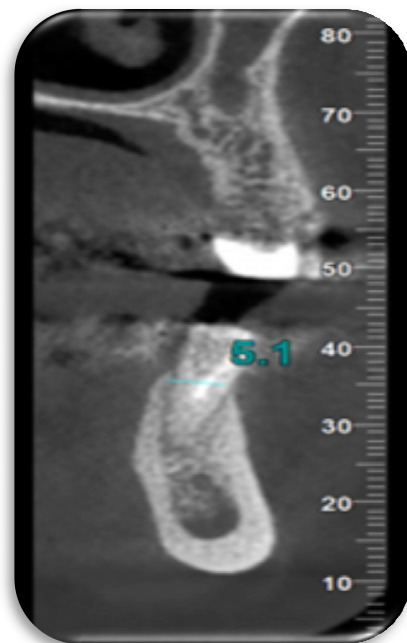
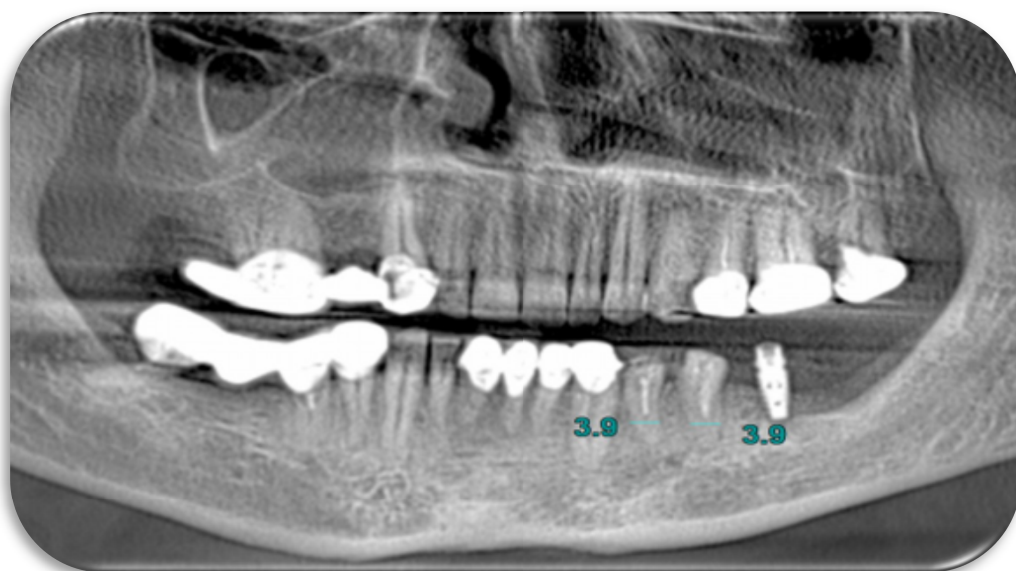
The physiological remodeling of the alveolar ridge is a common sequela of tooth extraction and is associated with significant horizontal and vertical loss of bone in the healing phase [1]. Such post-extraction resorption may compromise the esthetic and functional results of future prosthetic rehabilitation, particularly implant-supported restorations. Therefore, socket preservation procedures have become an accepted method of preserving alveolar ridge dimensions and promoting favorable bone regeneration after tooth extraction. Various biomaterials and regenerative approaches have been evaluated to enhance socket healing and preserve ridge dimensions. Demineralized freeze-dried bone allografts (DFDBA) are among the most used allogenic graft materials because of their osteoconductive scaffold and potential osteoinductive properties. DFDBA contains bone morphogenetic proteins which may stimulate new bone formation and render it a predictable option for ridge preservation procedures [2].

Platelet-rich fibrin (PRF) is a second-generation autologous platelet concentrate that has been introduced as a biologically active material to improve wound healing and tissue regeneration. PRF contains a fibrin matrix with platelets, leukocytes and growth factors that promote angiogenesis, soft tissue healing and bone regeneration. PRF can also be used as a socket-filling material or plug and serves as a simple, cost-effective, and minimally invasive method of post-extraction socket management [3]. Although both DFDBA and PRF have demonstrated favorable outcomes in socket preservation, differences exist in their mechanisms of action, regenerative potential, and clinical applications. Comparative evaluation of these modalities may provide valuable insights into their effectiveness in maintaining alveolar ridge dimensions and promoting bone healing following tooth extraction [4]. This case report

presents a clinical comparison of socket preservation using DFDBA allograft and a PRF plug in extraction sockets. Clinical and radiographic outcomes were assessed to evaluate their respective roles in ridge preservation and healing, thereby contributing to the growing evidence regarding optimal management of post-extraction sites.

#### Case Report:-

A 61-year-old male patient reported to the Outpatient Department of Dr. R. Ahmed Dental College and Hospital with the chief complaint of a failing implant and two root stumps (34 and 35 respectively). The patient also needed prosthetic replacement of the same. The patient was anon-smoker and reported no history of systemic illness.



**Findings at Baseline (Pre-operative)**

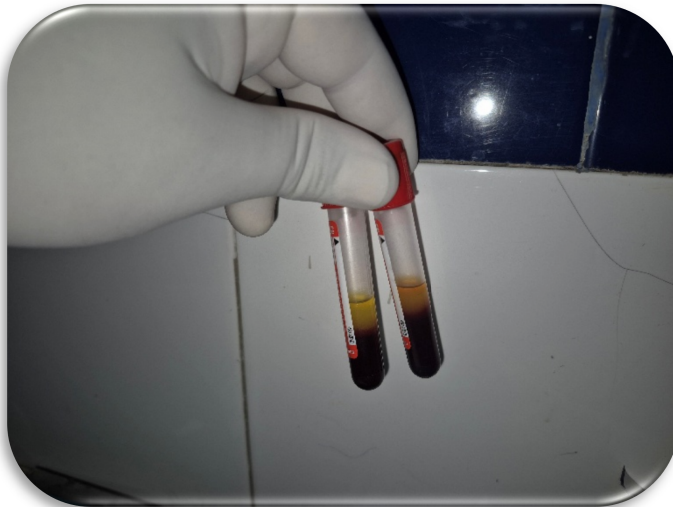


When the patient was clinically examined, a failing implant i.r.t 36 was seen and 34 and 35 were root stumps respectively. In the region of 36 there was an insufficient vertical bone height, so 34 and 35 were chosen to place an implant in 34, 35 regions. After discussing the treatment options with the patient, he agreed for socket preservation followed by implant placement after 6 months. Informed consent was obtained from the patient. A thorough scaling and root planning was performed 2 weeks prior to the surgery. At the time of surgery under local anesthesia, a periosteum was used to detach the periodontal fibers and a luxator was used then to luxate the tooth. The tooth when sufficiently mobile was then extracted with the help of extraction forceps. Curettage was done in the socket with a spoon excavator and remaining granulation tissue was removed and then the socket was rinsed with sterile saline.



**Atraumatic extraction followed by curettage**





**Preparation of PRF plug**



**The PRF plug is placed in the socket**





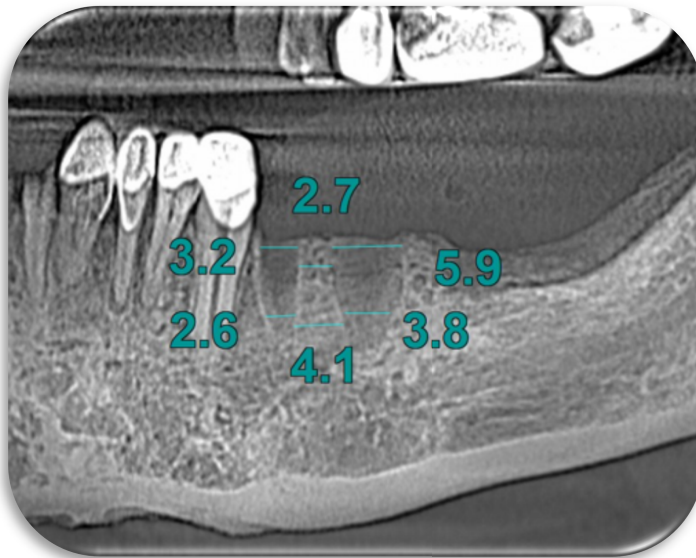
**Placing the graft :DFDBA**



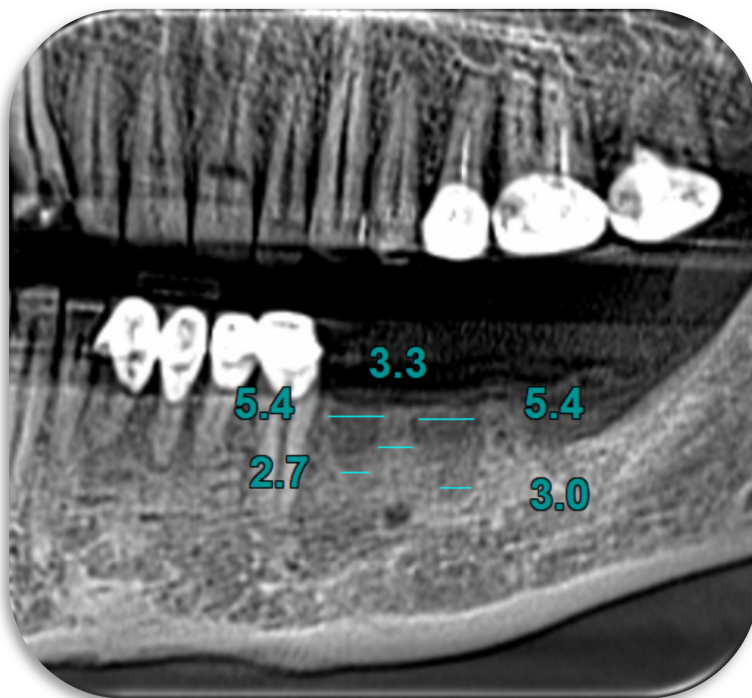
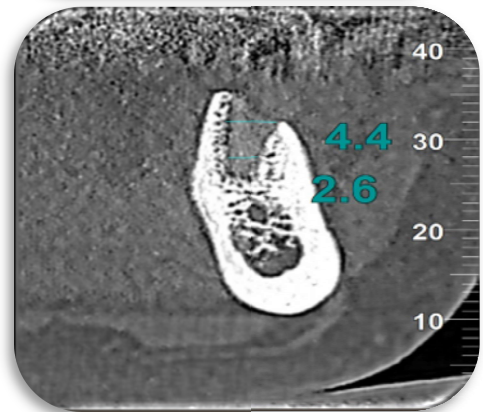
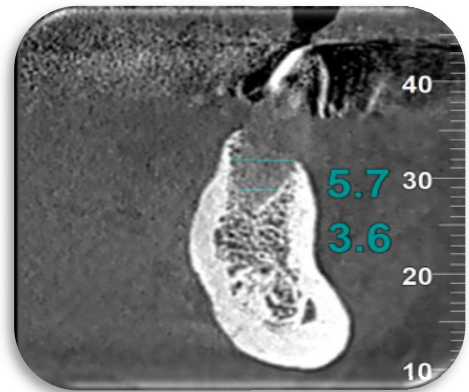
**A Collagen sponge is placed over the graft**



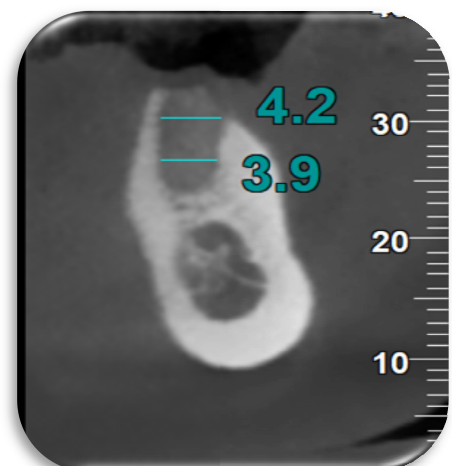
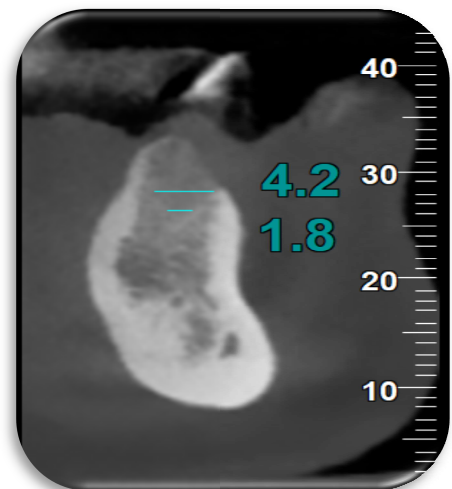
**Primary closure: with the graft and collagen in place**



Findings after 1month 15 days



Findings after 3 months



**Discussion:-**

Socket Preservation refers to the procedure of grafting the extraction socket immediately after tooth removal to reduce horizontal and vertical ridge loss. Many techniques have been advocated to preserve the socket to fulfil the goal of implant placement in the future. Grafting is a simple procedure that can be used in our day-to-day practice to prevent the socket from collapsing and aid in augmentation of the same. Iasella, Greenwell, et al, it was demonstrated that grafting extraction sites with freeze-dried bone resulted in greater height and width of the alveolar ridge than nongrafted sockets. According to Nicolas et al,[5]. The socket is classified for better understanding of the steps to follow to preserve it.

**Type I Socket. The facial soft tissue and buccal plate of bone are at normal levels in relation to the cemento-enamel junction of the pre-extracted tooth and remain intact post extraction: -**

- Type II Socket. Facial soft tissue is present, but the buccal plate is partially missing following extraction of the tooth.

- Type III Socket. The facial soft tissue and the buccal plate of bone are both markedly reduced after tooth extraction. In this patient, we had two extraction sockets planned for grafting. One socket was planned to be grafted with DFDBA and the other by a PRF plug. Following placement of the respective grafts, both the sockets were covered by a collagen membrane, and primary closure was done with 4-0 polyamide suture. DFDBA was chosen since it is demonstrated to possess both osteoinductive and osteoconductive properties. Also, it has very low antigenic property (denatured=protein/antigenic part is removed), so graft rejection chances are minimal [6].

PRF plug is an autologous platelet concentrate that is widely used now as a biologically active material to improve wound healing and tissue regeneration. PRF harbors several growth factors (TGF- $\beta$ 1, PDGFs, VEGF, and IGFs) that promote angiogenesis, soft tissue healing and bone regeneration. PRF provides a simple, cost-effective, and minimally invasive method of post-extraction socket management [7,8]. Following placement of the PRF plug, a collagen membrane was placed over and sutured with a 4-0 polyamide suture. The patient was put on analgesics and antibiotics for 5 days post-operatively and followed up regularly. Suture removal was done. However, post-operative period was eventless with not much complaint of pain. In the current research, CBCT was utilized for assessing bone height and width changes.

**The following was observed:-**

| Duration   | Buccolingual(mm)     | Mesiodistal(mm)        |
|------------|----------------------|------------------------|
| Baseline   | 34 (5.1mm) 35(5.7mm) | 34 (3.9mm) 35 (3.9 mm) |
| 1.5 months | 34(3.2 mm) 35(5.9mm) | 34 (5.7 mm) 35 (4.4mm) |
| 3 months   | 34(5.4mm) 35(5.4mm)  | 34 (4.2mm) 35(4.2mm)   |

**Conclusion: -**

Within the limitations of this case, socket preservation using DFDBA demonstrated better maintenance of alveolar ridge dimensions and more favorable clinical healing compared with the PRF plug alone at 1.5-month follow-up. But at 3-month follow-up no significant difference was noted. Although both techniques supported post-extraction healing, DFDBA appeared to provide superior preservation of the extraction socket initially. These findings suggest that DFDBA may be a more effective option for socket preservation when maintaining ridge architecture is essential. However, further studies with larger sample sizes and longer follow-up are required to validate these observations.

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None

**Conflicts of interest: -**

None



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