CASE REPORT
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Effectiveness of Platelet Rich Fibrin in the Management of Pain and Healing of Dry Socket

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ABSTRACT

Alveolar osteitis, also known as dry socket, is a common unwanted complication related to tooth extractions, frequently seen among females, especially in the mandibular teeth. Many treatment options to tackle this post-op complication have been used ranging from a less conservative to a radical surgical option with new developments being made. One such recent development has been the use of platelet-rich fibrin, which is also used for many other oral surgical procedures with promising and positive results.

One such case has been presented and documented with a 50-year-old female who presented with radiating post-op pain following 3 days after the extraction of her mandibular premolar. Segregated platelet-rich fibrin was extracted from the patient's blood and placed in the socket, secured with sutures. There was a remarkable decrease in her post-op pain by the 7th day with a complete recovery within 10 days.

Keywords: Alveolar Osteitis, Platelet Rich Fibrin, Post-Operative Pain

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INTRODUCTION

The term dry socket was used by an American dentist James Young Caward in 1896.[1] It is a common complication after surgical or non-surgical tooth extraction. The frequency of dry socket is greater in females than in males. According to Buchanan, the frequency of dry socket in mandibular extraction is greater as compared to maxillary extraction.[1] Dry socket appears as a severe, debilitating constant pain that continues throughout the night and it is mostly associated with foul taste and halitosis. Clinically an empty socket with exposed bone is seen.[2] Predisposing factors are smoking and tobacco use, oral contraceptives, traumatic tooth extraction, poor oral hygiene, previous history of dry socket, use of aspirin or other medications, age and sex, infections, improper aftercare, rinsing or spitting excessively.[3] Prevention and treatment of dry socket encompass various strategies such as modifying surgical techniques, administering antibiotics, rinsing the mouth with antimicrobial agents before extraction, socket lavage, and applying different medications to the socket.[4] Initially, French clinicians recommended using Platelet-Rich Fibrin (PRF) following tooth extraction to accelerate healing, reduce postoperative pain, and prevent dry socket Recently, numerous authors have reported excellent results using PRF for the prevention of dry socket after the removal of lower third molars and for the treatment of dry socket.[5] The majority of research on Platelet Rich Fibrin in oral surgery focuses on its use in sinus lifts, bone augmentation, and socket preservation, etc.[5] PRF is a revolutionary blood-derived product used in wound regeneration.[6] Recent studies suggested rapid epithelization and faster bone regeneration with Platelet Rich Fibrin.[6] PRF in the extraction socket shows better healing and reduced incidents of dry sockets or prevention of dry socket incidents because the PRF causes the process of regeneration of hard and soft tissues and revascularization. So, platelet-rich fibrin can be used in dry sockets for management and delayed healing.[6] PRF contains certain growth factors and other biologically active substances. These factors increase angiogenesis, chemotaxis, and epithelialization with enhanced osteogenesis and cause faster resolution of pain in dry socket because the kinins released from dry socket will be antagonized by these growth factors.[5] PRF is effective, biocompatible, and safe because it is derived from the patient's own blood[7], upon comparison with existing treatment options. The use of Platelet Rich Fibrin showed faster and better alveolar mucosal healing, which is earlier than the Zinc oxide eugenol group.[8] The benefits of this treatment include its ease of use, the fact that it can be performed by any dentist, and the fact that it has a rapid impact on pain levels, followed by a rapid epithelialization of the socket.[4]

CASE REPORT

A 50-year-old female presented to the oral and maxillofacial department of Islamic International Dental Hospital with the chief complaint of severe debilitating, radiating pain along with foul taste and smell from the last 2 days. It all began 3 days after the extraction of the lower right 2nd premolar that was extracted non-surgically but according to the patient, it took a lot of time to come out. The patient's medical history was unremarkable. Her dental history included multiple extractions on examination an open wound with ischemic white bone was seen that was fully exposed without soft tissue coverage. The Visual Analog Scale (VAS) is a widely used tool to measure subjective experiences such as pain intensity and a simple, reliable, and sensitive method to quantify pain levels, often employed in both clinical and research settings in which Pain was evaluated using a 10-point horizontal visual analog scale, with a score of "0" signifying "no pain" and "10" indicating "very severe pain.[5] Pain recorded on VAS was 9. The socket was irrigated with normal saline to clear the debris. PRF was prepared according to Choukron's protocol.[5] Venous blood was drawn from the patient's arm in a vacuum test tube of 10 ml without any anticoagulant and immediately put into a centrifuge for 12 minutes at 3000 RPM.[5] 3 layers were formed in a test tube, the top layer contained a cellular plasma, a fibrin clot was formed in the middle layer, and red corpuscles were in the bottom part. The fibrin clot was separated from other layers and segregated Platelet Rich Fibrin was placed into an area of exposed bone and stabilized with sutures.[5] The pain was evaluated post-Platelet Rich Fibrin placement first, third, seventh and tenth days through the same visual pain analogue scale and healing of the socket was evaluated through granulation tissue formation at socket walls.[5] The pain was reduced to 5, 3,1, and 0 on the 1st,3rd,7^{th,} and 10th day(Figs 1-4) and all socket walls got covered till the 10th day.

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Figure 1: Pre-Operative Picture

Figure 2: Post-Operative Day 3 - After Placement of Platelet Rich Fibrin

Figure 3: Post-Operative Day 7 - After Placement of Platelet Rich Fibrin

Figure 4: Post-Operative Day 10 - After Placement of Platelet Rich Fibrin

DISCUSSION

Exodontia frequently has problems, such as dry sockets, which make patients more reticent. Bacteria are recognized to have a significant role in the multifactorial etiology of Alveolar Osteitis(AO).[9]Several investigations have expanded the role of Actinomyces viscosus and Treponema denticola in dry socket.[10,11] As a result, the use of antibiotics in mouthwash and intrasocket medicine became more widespread.[5] Several pharmacological medications, such as chlorhexidine in the form of gel and mouthwash, were suggested and developed to prevent dry socket.[12]

Clinicians' priority is always to ensure that wounds heal quickly and easily since it is widely believed that growth factors may be present in the surrounding environment. Being a rich supply of growth factors, PRF is a promising biomaterial for accelerating bone regeneration and wound healing.[13] This case report showed a decrease in post-operative pain of a patient after administering PRF in the socket and also early soft tissue healing was seen, results were comparable to Sharma et al.[5] Platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), transforming growth factor-1 (TGF-1), bone morphogenetic protein-1 (BMP-1), coagulation factors, adhesion molecules, and various other angiogenic factors that stimulate the activation and growth of the cells promoting wound healing are among the cytokines, chemokines, and structural glycoproteins that make up PRF. These biochemical components help increase the remodeling of the fibrin network into a more lasting connective tissue and speed up angiogenesis, which

both aid in the better healing of soft tissue wounds.[13] our study indicates rapid less painful healing with PRF in the treatment of dry socket from day 1 to day 7 and results are in conjuction with study done by Chenchev et al.[4]

The current case report demonstrated how significant pain was evaluated using the visual analog scale before, but when PRF was applied, there was a noticeably reduced level of discomfort The usage of PRF decreased the intensity of pain our study indicates remarkable reduction in pain intensity from day 1 to day 7 relatable to the results of Kumar et al.[14] PRF functions as an immunological regulator and may lessen the harmful consequences of inflammation prove from our study in which healing was rapid and without or less pain from day 1 to day 7 shows efficacy of PRF comparable to the results of Dohan et al.[15]

CONCLUSION

This study suggests that PRF (Platelet-Rich Fibrin) is a superior treatment for dry socket, being more effective, quicker, less invasive, and more cost-efficient. Since PRF is sourced from the patient's own blood, it minimizes the risk of allergies or adverse reactions, unlike Alveogel, which may be perceived as a foreign substance. Therefore, PRF is recommended for regular use in the treatment of dry socket.

DISCLAIMER

None to declare.

CONFLICT OF INTEREST

There is no conflict of interest among the authors.

ETHICAL STATEMENT

Ethical approval was taken from the Research Ethics Committee of Islamic International Dental Hospital (Ref: IIDC/IRC/2023/005/001).

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AUTHORS CONTRIBUTION

Conception and design of study: H. Bibi, G. Rizwan

Acquisition of data: H. Bibi, Z. Rizwan, S. H. Zia

Analysis and/or interpretation of data: H. Bibi

Drafting the manuscript: Z. Rizwan

Revising the manuscript critically for important intellectual content: H. Bibi, G. Rizwan, S.H. Zia

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