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CASE REPORT

PRF A NOVEL ACUMEN FOR MANAGING POST-SURGICAL DEFECTS AFTER REMOVAL OF MANDIBULAR THIRD MOLARS: A CASE REPORT

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ABSTRACT:

Platelet-rich fibrin (PRF) or leucocyte- and platelet-rich fibrin (L-PRF) is a second-generation PRP where autologous platelets and leucocytes are present in a complex fibrin matrix to accelerate the healing of soft and hard tissue. A platelet-rich fibrin (PRF) membrane containing bone growth enhancing elements can be stitched over the wound or a graft material or scaffold is placed in the socket of an extracted tooth at the time of extraction. The socket is then directly closed with stitches or covered with a non-resorbable or resorbable membrane and sutured. It is known that platelets are involved in the process of wound healing through blood clot formation and release of that promote and maintain the wound healing. In this article we have discussed a case treated with PRF after surgical removal of mandibular third molar.

KEY WORDS: Platelet-rich fibrin, growth factors,complex fibrin matrix, platelet rich plasma, centrifugation, wound healing

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INTRODUCTION:

Platelet rich fibrin is a second generation PRP where autologous Leucocytes are present in a complex fibrin matrix[1, 2] to accelerate the healing of soft and hard tissue[3] and are used as a tissue-engineering scaffold[4]. Development of the bioactive surgical additives is one of thegreat challenges of clinical research which has been used toregulate inflammation and increase the speed of healingprocess.[1] Platelet concentrate fibrin is an evolution of the fibrin glue widely used in the oral surgery.[5] A wide range of intra- and extra articular events and various signaling proteins mediate and regulate thehealing process of both hard and soft tissues, respectively.[1]The primary goal of dental treatment is the maintenance of the natural dentition in health and for optimum comfort,function, and esthetic. After surgical procedure healing usually occurs by repair or regeneration.[6]

The platelet-rich plasma (PRP) is an autologous product that concentrates a high number of platelets in a small volume of plasma. This product mimics the last step of the coagulation cascade, leading to the formation of a fibrin clot, which consolidates and adheres to the application site in a short period of time. Evidencing hemostatic and healing properties, PRP is able to hold tissues or materials in a required configuration.[7]

PRF is amongst the second new generation of platelet concentrates which does not require biochemical blood handling and its processing is simple.[8]PRF has many advantages over conventionally prepared PRP which has been used for enhancing wound healing, soft as well as hard tissue wound healing. As the preparation has to be strictly autologous, it is obtained in a very small quantity.

CASE REPORT:

A 26 years old female patient, reported to the Department of Oral And Maxillofacial Surgery, M A RAGOONWALA College of Dental Sciences And Research Centre, complaining of pain and swelling in the lower right back teeth region. Present condition was slow and progressive since last one month On examination, clinically the patient presented with pericoronitis with impacted mandibular right third molar. On radiographic examination after taking an intra-oral periapical

radiograph she was diagnosed with disto angularly impacted mandibular right third molar with close proximity to adjacent second molar(Figure.1).Hence surgical removal of the third molar was advised with PRF placement to enhance wound healing and avoid mobility with lower right second molar. 10 cc Blood was withdrawn and sent to lab for PRF preparation. PRF was prepared ina centrifuge, at rpm 3000 for 10minutes

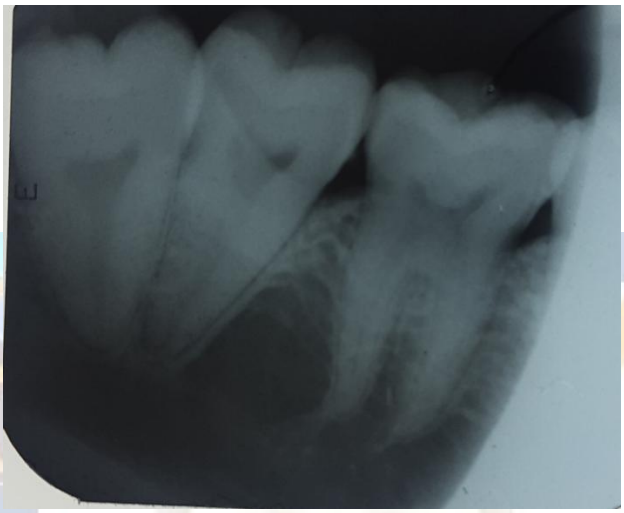

Figure 1: Pre-operative radiograph

Figure 2: PRF prepared in a centrifuge, at rpm 3000 for 10 minutes.

Figure 3: Fresh extraction socket of the lower right third molar

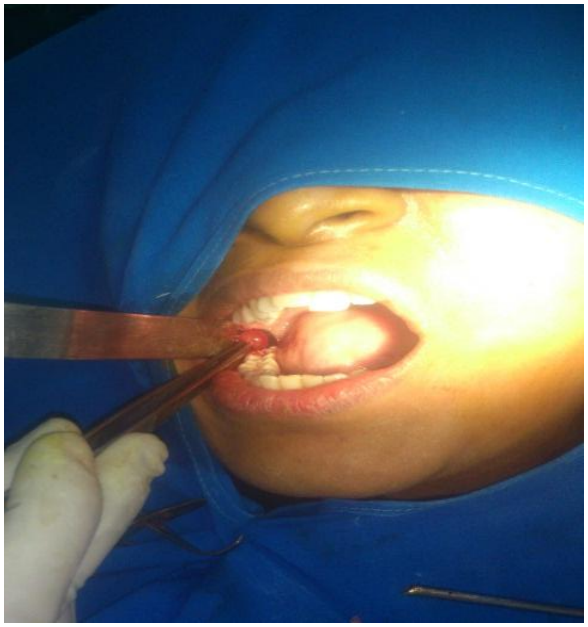

Figure 4: Approximately 2cc PRF was placed in the surgical wound.

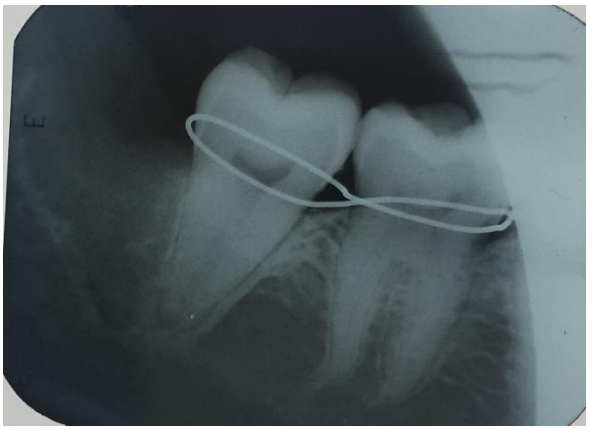

Figure 5: Intra oral periapical radiograph was taken after three month.

Surgery was initiated by placing a classical wards incision on the right side to expose the impacted tooth. Bone removal was done using carbide burs no. 8, 702 and 703 respectively. Tooth was extracted uneventfully(Figure.3). After third molar extraction, grade I mobility was found with adjacent second molar. Splinting was advised and done to secure the second molar in place, for four weeks. Around 2cc PRF was placed in the surgical wound(Figure.4). Closure was done with 3-0 silk.

Follow up was after 3 days, 15 days, 1 month and 3 months. Healing was satisfactory and uneventful. Patient recovered well with reduced mobility of the second molar and good rehabilitation. Intra oral periapical radiograph was taken after three month follow up presented, adequate post-operative healing with radiolucency indicative of good amount of bone formation along with intact periodontal ligament lining indicating good socket preservation(Figure.5).

DISCUSSION:

Historically, PC are the natural evolution of the fibrin sealants developed more than 40 years ago.[9] In 1974, platelets regenerative potentiality was introduced, and Ross et al., were first to describe a growth factor from platelets.[10]PRP has been in use for several decades and has been reported in many disciplines of such as cardiac surgery,orthopedics and oral and maxillofacial surgery. Although the use of fibrin to enhance and accelerate wound healing is since last 3-4 decades but its understanding of its mechanism of action is still not complete.[11]However Platelet-rich fibrin another member of platelet concentrate family appeared in France as a result of legal

restrictions on handling of bloodas biochemical handling of blood is avoided in PRF preparation.[3,12,13]

Several studies have proved that addition of specific growth factors enhance the bone regenerative procedures.In order to accelerate wound healing enhance bone regenerative procedures Platelet rich plasmawas used as a method of introducing growth factors such as insulin-like growth factor, transforming growth factor-beta, and platelet-derived growth factor to the surgical site thus enriching the natural blood clot.PRF eliminates the requirement of bovine thrombin in order to enhance conversion of fibrinogen to fibrin. Hence the addition of anticoagulant is also avoided.[14]Platelet-rich Fibrin (PRF), contains good concentrations of growth factors, is used with cancellous bone particles for bone grafting procedures in oral and maxillofacial surgery.[15]Since the day of its introduction PRF has been used along with different grafts in bone augmentation procedures.

A new revolutionary step in the platelet gel therapeutic concept represents PRF. This technique does not require any gelifying agent, unlike other platelet concentrates, but centrifugation of the natural blood without additives. The production protocol of PRF attempts to accumulate platelets and released cytokines in afibrin clot. The fibrin matrix supporting the platelets and leukocyte cytokines play an important role in determining the therapeutic potential of PRF.In a healing wound Cytokines are immediately used and destroyed. The importance of harmony between cytokines and fibrin matrix is much more unique than any other constant.[1]A physiologic fibrin matrix (such as PRF) will have very different effects than a fibrin glue enriched with cytokines (such as PRP), which will have a massively uncontrollable and short-term effect.[16]

Socket preservation, a procedure to reduce bone loss after tooth extraction to preserve the dental alveolus (tooth socket) in the alveolar bone. A platelet-rich fibrin (PRF) membrane containing bone growth enhancing elements can be stitched over the wound or a graft material or scaffold is placed in the socket of an extracted tooth at the time of extraction. The socket is then directly closed with stitches or covered with a non-resorbable or resorbable membrane and sutured.

A platelet-rich fibrin can be used if a sinus lift is required for a dental implant.Guided bone and tissue regenerationPRF is used in guided bone and tissue regeneration.Regenerative

endodonticsPRF enhances alveolar bone augmentation and necrotic dental pulp and open tooth apex can be revitalized in regenerative endodontics with platelet-rich fibrin.[9]

PRP vs PRF[11]

PRP	PRF
• Limited potential to stimulate bone regeneration. • May be toxic on body cells.	• No Biochemical Handling Required. • The use of anticoagulant is avoided. • Favourable for healing. • Supportive effect on immune system. • Helps haemostasis. • Simple and cost effective.

CONCLUSION:

In this case we found that PRF acceelarates wound healing both soft as well as hard tissue healing and is potent media for socket preservation procesures. Further studies should be undertaken to explore the importance of PRF as a autologous grafts in minor oral and maxillofacial surgical procedures.

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