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AUTHOR: XXX

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ABSTRACT

The purpose of this research is to demonstrate dentin bridge development in the currently described instance following direct pulp capping in reversible pulpitis and preservation of the dental pulp's vitality[1].

As an autogenous graft made from the body's own tissue, PRF promotes biological healing kinetics. The current clinical approach uses PRF as a direct pulp capping agent, which may aid in the repair and regeneration of pulp. It is also thought to be a therapeutically viable procedure[1,2].

Under anesthesia, the hemostasis procedure for the pulp wound and cavity decontamination with gaseous ozone were carried out[3]. Blood plasma was used to create a sizable A-PRF+ membrane that was then placed to the pulp wound. The cavity was sealed using glass-ionomer cement after that MTA was applied.

Clinical and cone beam computed tomography findings demonstrated the formation of a dentin bridge[4].

Keywords: direct pulp capping; regenerative endodontic therapy; platelet-rich fibrin; A-PRF+.

I. INTRODUCTION

When treating illnesses of the hard tooth tissues, maintaining the dental pulp's vitality is of utmost importance. After dental pulp damage, endodontic treatments are complicated, time-consuming, expensive, and unpredictable[2].

Platelet-rich fibrin has been demonstrated to be the best scaffold for various dental applications. Growth factors gave it an advantage over other treatment modalities. Using an autogenous graft scaffold, which PRF considers to be, can be employed in operative dentistry to for purposes of healing and regeneration.

A resorbable fibrin matrix loaded with platelets and leucocytes is employed in a chairside treatment known as platelet rich fibrin.

The platelet-rich fibrin procedure provides a rich serving of growth factors, such as those derived from platelets, transforming growth factors, vascular endothelial derived growth factors, and interleukin derived growth factors, which aid in tissue regeneration in a physiological manner and can preserve the vitality of the tooth structure[4,5].

Rare cases of reversible pulpitis being treated with platelet concentrates while maintaining the vitality of the tooth pulp have been reported in the literature.

In a randomized research, Shobana et al. compared the outcomes of direct pulp capping with MTA and platelet concentrates[6].

Rutherford et al. suggested employing growth factors for direct pulp capping as early as 1995.

Bjrdal et al. claim that when treating reversible pulpitis, there are significant doubts regarding the superiority of one approach over another and the optimum biomaterial for blocking pulp communication. The exposed dental pulp raises the possibility that the prognosis for therapy will be poor. Future management techniques for the exposed dental pulp will require more research and ideas[7].

II. CASE REPORT

A 20-year-old male patient came to department of conservative dentistry and endodontics complaining of mild to moderate discomfort in lower left back tooth region since past 2 weeks. On clinical examination occlusal caries extending on buccal surface of tooth with food lodgment was seen. History reveals pain on biting hard object. Radiographically caries extending on to the dentinal surface approximating pulp chamber[Figure 1].



Figure 1: Pre-operative radiograph

Entire treatment option was discussed and informed to patient. Vitality test was carried out both thermal and EPT, showed normal response when compare with adjacent tooth. No pain on percussion observed. Treatment was carried out



under aseptic condition. Pre procedural oral rinsing with 0.2% Chlorhexidine solution was asked to carried out. This is in order to control the number of microorganisms in oral environment. After complete isolation with rubber dam application.

Sterile round bur and spoon excavator is used to remove caries structure.

During the excavation of caries, the lesion was found to communicate with the dental pulp near the mesial and distal pulp corn by approximately 1.5 mm, with minimal bleeding[Figure 2]. For this treatment, the patient signed a standard informed consent. In addition, due to the use of platelet concentrate, the patient also signed an informed consent to administer A-PRF+. Direct pulp capping was performed using A-PRF+ in accordance with Choukroun's protocol[Figure 3].



Figure 2: Exposed cavity



Figure 3: Dental-pulp communication covered by reparative dentin

Fabrication of platelet rich fibrin

The patient's median cubital vein was used to take 5 ml of venous blood, which was then collected in tubes without anti-coagulants. The blood was immediately centrifuged for 10–15 minutes at 3000 RPM. In tubes, three layers will be created. Using a membrane processing box, the

fibrin membrane-containing middle section was removed.

For better healing in the case study presented here, a PRF autogenous graft was positioned as a barrier between the exposed pulpal tissue and the calcium hydroxide substance and glass ionomer cement was used to temporarily seal the teeth for 4 weeks.

Palpable EPT was used for the post-operative examination, and the patient was asymptomatic for the vitality test. Finally, Composite restoration was used to replace interim restoration.

III. DISCUSSION

The A-PRF+-derived fibrin membrane serves as a scaffold for the regeneration of the tissue on which it is positioned. The dental pulp is the target tissue in this instance.

Additionally, this concentrate includes growth factors that have been activated from platelet granules during blood centrifugation. Vascular endothelial growth factor, platelet-derived growth factor, transforming growth factor-beta, epidermal growth factor, and insulin-like growth factor are among the vital growth factors for wound healing. The resulting fibrin matrix A-PRF+ has enhanced interfibrillar gaps and porous structures, which facilitate cell migration. The platelet distribution is uniform, and their quantity rises noticeably[8].

A randomized study comparing direct treatment with MTA, PRP, and PRF pulp

capping agents was published in June 2022 by Shobana et al. They conducted a CBCT study at 12 months and found a thicker dentin bridge in the groups treated with growth factors[6,8].

According to a study by Kirilova et al. employing A-PRF +, treating chronic apical periodontitis results in a quick healing process. At the sixth month of treatment, recovery of the bone structure was statistically significant and nearly complete[9].

We used artificial materials like MTA and biodentine, which are quite expensive and have problematic handling properties, to control deep cavities.

The current case study has demonstrated a substitute for artificial material where PRF can be applied directly to pulpal tissue that has been exposed[10].

However, the outcomes of this investigation are only partially conclusive. The clinical protocol has to be improved, the suggested time frame for control examination needs to be



clarified, the precise indications for platelet concentrates need to be clarified, etc.

IV. CONCLUSION

We detected the development of dentin bridge in this case following the application of the platelet concentrate A-PRF+ using clinical and CBCT examination. For six months, the dental pulp's vitality was maintained (normal EPT levels)[Figure 5,6].

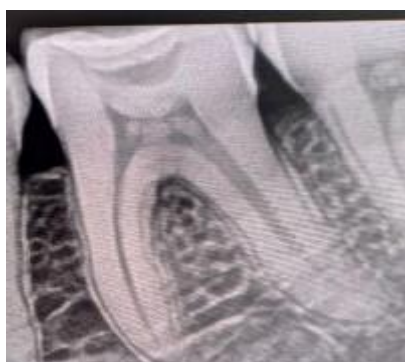


Figure 5: Post-operative radiograph showing dentin bridge formation w.r.t. tooth no.36

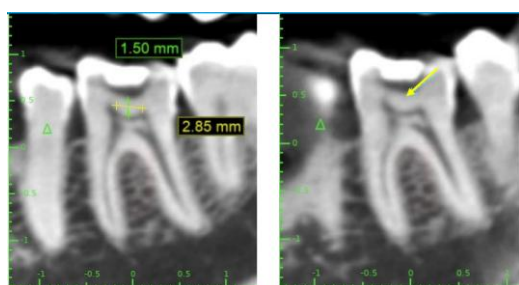


Figure 6: CBCT analysis was done after six months(Sagittal section).

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