

Closure of Oroantral Communication with Platelet Rich Fibrin: A Case Report

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Abstract

Introduction: Oroantral communication (OAC) is an iatrogenic complication that occurs most frequently after the extraction of maxillary posterior teeth. Various techniques have been described in literature for its closure. Nevertheless, regenerative medicine has emerged as a novel strategy utilizing bioactive materials such as Platelet-Rich Fibrin in management of oral and maxillofacial soft and hard tissue wounds including OAC. **Case Report:** The present report describes a closure of oroantral communication using PRF. The OAC occurred after the extraction of the right first maxillary molar in a 68-year-old patient. After one month of follow up, the extraction site showed a good healing process without any local or sinus complication. **Conclusion:** the closure of OAC using platelet-rich fibrin membrane is a less invasive procedure than buccal sliding flap or buccal fat-pad techniques. It keeps the vestibular sulcus depth. It is also autogeneous and contains growth factors, which helps to accelerate soft tissue repair.

Keywords: Oroantral communication, platelet-rich fibrin, autogenous, regenerative.

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INTRODUCTION

An oroantral communication (OAC) is an open connection between the oral cavity and maxillary sinus [3]. It is a complication that occurs most frequently during the extraction of the first and second maxillary molars, less frequently the third. If left untreated, OAC may rapidly lead to infection of the antrum. Therefore, early diagnosis of OAC is required for a positive outcome [10].

Various methods have been described in literature for closure of these communications. The most commonly used ones are either the buccal flap or the buccal fat-pad techniques [2].

Recent researches showed that platelet-rich fibrin (PRF) is also a useful approach for the management of acute oroantral perforations with a diameter of 5 mm or less [1, 5, 6, 9].

PRF is a second-generation platelet concentrate that was first described by Choukroun et al. It has since been widely employed in conjunction with bone graft materials for periodontal regeneration, ridge

augmentation, sinus lift operations for implant placement, and membrane coverage of recession defects [4-11].

The aim of this case report was to describe a case of OAC closure using PRF membranes that showed a good healing process without any local or sinus complication.

CASE REPORT

A 68-year-old female patient with a history of arterial hypertension and hypercholesterolemia presented to the dental medicine department at Sahloul hospital with spontaneous and lancinating pains related to the crowned right maxillary first molar. The diagnosis of acute apical periodontitis was made and the decision to extract the tooth was taken.

The preoperative retroalveolar radiograph revealed a close relationship between the apices of the molar and the sinus floor. An oroantral communication was then predicted (Figure 1).

After tooth extraction, a three-millimeter-sized oroantral communication on the mesio-vestibular root

side occurred as anticipated and was confirmed with the mirror test (Figure 2).



Figure 1: Preoperative retroalveolar radiograph



Figure 2: Air bubbles in the mesio- vestibular socket confirming the OAC

Clinical Procedure

The post-extraction socket of the tooth was cleaned with a physiologic saline solution. The oroantral communication was then closed with Platelet-rich fibrin (PRF) membranes. The PRF clots were collected from a blood sample taken from the patient and centrifuged immediately (Figure 3): A first membrane was inserted gently into the extraction socket (Figure 4). The extraction site was then covered with a second membrane that was sutured to the gingival margins (Figure 5).



Figure 3: Platelet-rich fibrin clots



Figure 4: PRF clot placement at the oroantral communication



Figure 5: Suturing of the second PRF membrane superficially

Postoperative management

An Amoxicillin-Clavulanic acid-based antibiotic (Augmentin) was prescribed at a rate of 2g a day for seven days, along with 3g of paracetamol (Adol) each day for five days and a mouthwash based on chlorhexidine three times a day for ten days. The patient was instructed to avoid nose blowing and coughing.

Follow up

The patient was followed up clinically after seven days and then one month. The extraction site showed a good healing process. There was no inflammatory reaction or signs of maxillary sinusitis (Figure 6).



Figure 6: A layer of fibrin covering the entire site

DISCUSSION

Closing the communication is the most important component in treating acute OAC because it prevents food and saliva contamination, which can lead

to bacterial infection, chronic sinusitis, and impaired healing [4]. Many techniques have been described for the closure of moderately-sized OAC. The most common techniques are buccal flap and buccal fat-pad [6]. However, these techniques have certain disadvantages such as swelling and pain. In long term, the depth of the buccal sulcus is decreased and the adaptation of the dental prosthesis is impaired after performing mucoperiosteal flaps slid from the buccal area [4]. Partial or total necrosis of the adipose tissue might occur during the implementation of the buccal fat-pad technique. Changes in facial contour were also reported in some patients [8].

As a result of these disadvantages, PRF was used as an alternative. PRF (platelet-rich fibrin) is a product of centrifuged blood that was described for the first time by Choukroun *et al.*, Biochemical analysis of PRF composition shows that this biomaterial consists of accumulated cytokines, glycan chains and glycoprotein structures inside the slowly polymerized fibrin network. These biological components are well-known for their role in the healing process as synergistic factors. They include: Platelet-Derived Growth Factor (PDGF), Transforming Growth Factor beta (TGF β), and Insuline Growth Factor (IGF). Many cytokines are found in a PRF clot, including inflammation cytokines like IL-6, IL-1, IL-1, TNF-, and healing cytokines like IL-4 and VEGF.

These components are responsible for the anti-inflammatory qualities of PRF, as well as its ability to accelerate angiogenesis and the creation of fibroblasts and osteoblasts, resulting in an enhanced healing process. PRF is also tissue compatible and free of alloplastic materials. Thus, it does not cause a foreign body reaction [1, 4-9, 11].

Taking all these into consideration, the capacity of PRF to improve OAC healing can be explained by the ability of the fibrin matrix to guide tissue repair [7].

Therefore, the closure of OAC with platelet-rich fibrin membrane is a less invasive procedure than buccal sliding flap or buccal fat-pad techniques. It keeps the vestibular sulcus depth. It is also autogeneous and contains growth factors, which helps to accelerate soft tissue repair [4-8].

However, using PRF alone for OAC closure has certain limits. Large defects and chronic oroantral fistula require the implementation of other surgical procedures [8-10].

CONCLUSION

Regenerative medicine that incorporates the patient's own autologous growth factors in the PRF matrix is a novel alternative strategy that should be

considered when the dentist is confronted with having to close an OAC.

PRF is collected through a minimally invasive procedure of venous blood collection. The technique requires minimal training for the clinician and is less invasive for the patient than buccal sliding flap or buccal fat-pad techniques. Using this biomaterial for the closure of OAC appears to be a very promising option.

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