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# GUIDED BONE REGENERATION IN RECONSTRUCTION OF BONE DEFECTS

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**Abstract**

Guided bone regeneration (GBR) is a bone graft procedure that uses a covering barrier membrane to block soft tissue invasion. Bone reconstruction for implant placement and for preparation for prosthetic restorations varies in numerous techniques and materials, each of them bringing advantages and specific qualities for different types of bone defects.

The case report present an efficient method of GBR by sticky bone which is obtained by mixing PRF and bone graft together supported by PRF membrane.

During the regular controls, no big swelling was seen, the patient did not complain of pain. The postoperative course was without complications.

***Key words:*** PRF, guided bone regeneration, bone defect, sticky bone, PRF membrane.

## Introduction

Guided bone regeneration (GBR) is a bone graft procedure that uses a covering barrier membrane to block soft tissue invasion over the bone [1,2]. Research is meant to enhance different types of biomaterials and surgical procedures for a long-term successful outcome of the implants and the prosthetic restorations [2, 3].

In terms of osteogenesis, all techniques known so far promise new bone formation, independent of the complexity of the clinical case. Improvements in different surgical protocols aim to shorten the surgery duration, reduce the number of treatment stages, the risk of intra- and postoperative complications, and the overall morbidity of the procedure [3–5].

Guided bone regeneration, the most commonly used technique, includes application of artificial bone with combination of PRF. Platelet-rich fibrin (PRF) represents second generation of platelet concentrates, which has gained increasing awareness in recent years for regenerative procedures.

This biologic additive is completely autologous, very easy to prepare, has minimal expense (everyone can afford it), and possesses prolonged growth factor release, together with several other advantages over traditionally prepared platelet concentrates[6].

Surgeons have to weigh the advantages of different surgical methods and biomaterials, the degree of tissue injury, the benefits and risks of minimally invasive techniques to obtain successful outcomes.

The aim of this case report is to present an efficient method of GBR by using the sticky bone which is obtained by mixing PRF and bone graft together supported by PRF membrane.

## Case report

A 50 years old male came at the dental office for fixed prosthetic restoration. The clinical examination showed luxation of the incisiors on the left upper maxilla.

On the X ray was determined bone loss around incisiors and there was no possibility for prosthetic restoration, that was indication for guided bone regeneration (GBR). The 8 $sm^3$ ( 2 $sm^3$ for each test tube)

blood from the cubital vain was taken before the surgical procedure and it was centrifuged in ``VIHOR-Yugomedica`` centrifuge.(Picture1 and 2) .

After local anesthesia (Scandonest 2%), in the same visit when the incisiors were extracted, the pathological lesion was eliminated. The centrifuged blood from the tubes was used for making the sticky bone by mixing the PRF with artificial bone (xenograft- Bio OSS 0.5 mm), (Picture 3).

Also, the PRF membrane was made for covering the sticky bone. (Picture 4).


**Figura 1.** VIHOR centrifuge

**Figura 2.** Centrifugation of blood

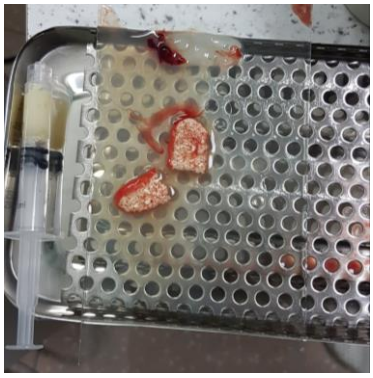

**Figura 3**. (Sticky bone preparing)

**Figura 4.** Preparing the PRF membrane

After the teeth extraction, and the curettage of the pathological process, the prepared sticky bone was placed and adapted in the bone defect (Picture 5,6) and PRF membrane was placed over it. (Picture 7,8).

**Figura 5.** Placing sticky bone in the defect

**Figura 6.** Placed sticky bone

**Figura 7.** Placing PRF membrane

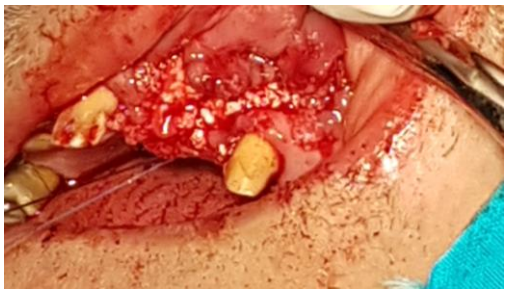

**Figura 8.** Placing PRF membrane

The wound was closed per primam with 4.0 silk suture. Antibiotic therapy was prescribed because of the long duration of the surgery. Regular check ups were made the second and the 7th days after surgery. During the regular controls, no big swelling was seen, the patient did not complain that pain was present in the postoperative period.

The postoperative course was with no complications during the 7th days period. The risk of intra- and postoperative complications, and the overall morbidity of the procedure were minimized. Sutures were removed on day 10. Also, the regular check up after 5 months showed sufficient bone volume for prosthetic restoration. In this case, it was planed an implant placement.

**Discussion**

Bone can be augmented by various methods such as distraction osteogenesis, use of various barrier membranes for GBR, particulate grafting material, onlay block graft, ridge-split technique, and the future application of molecules to stimulate bone formation rate and their various combinations.

Guided bone regeneration (GBR) and autologous bone graft are the most common techniques for alveolar bone augmentation.[7,8].

There should be minimum 2 mm bone around the implant for good dental emergence and correct prosthetic rehabilitation.[9,10].

For atrophic ridges, sufficient bone volume is required to place implants or make prosthetic rehabilitation.

Platelet-rich fibrin (PRF) is a healing biomaterial having potential for bone and soft-tissue regeneration without inflammation [11] It can be used alone or along with bone graft. Wang and Boyapati [12] suggested the PASS principle (P: primary closure, A: angiogenesis, S: space maintenance, S: stability) for successful GBR. Compressed PRF membrane acts as a barrier membrane. Mixing Injectable platelet rich fibrin (IPRF) with the granules of bone graft resulted in the formation of sticky bone. After placing sticky bone, a barrier membrane is used to support the grafted bone to the tissue. Ridge split technique also assists in bone augmentation.[13,14] .

Even greater results are achieved when this technique (PRF) is applied to some of the bone supplements. Gielkens et all. suggest to use a barrier membrane in cases of large bony defect and greater amount of bone grafts.[15]

**Conclusion**

Guided bone regeneration initiate the bone regeneration and the risk of intra- and postoperative complications, and the overall morbidity of the procedure is minimalized.

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