

## Bone Regeneration in an Extreme Dental Clinical Condition

### Abstract

Here, the authors present the clinical case of a 45-year-old woman with a diagnosis of a chronic periodontal abscess of the tooth #8. After atraumatic dental extraction and bone regeneration with the use of platelet-rich fibrin and bone graft, the area showed excellent bone regeneration with adequate stability of the soft tissue, even 4 months after the surgery.

**Keywords:** Bone defects, bone grafts, bone regeneration, dental extractions, platelet-rich fibrin

### Introduction

Currently in dentistry, many clinical situations such as dental fractures, periodontal abscesses, pain, inflammation and discomfort of patients are a challenge for the clinician.<sup>[1]</sup> When these clinical situations involve the anterior sector of the maxilla, an additional factor is added, the aesthetic.<sup>[2,3]</sup> The resorption of bundle bone is a physiologic certainty and no techniques currently available can prevent it. For this reason, a set of strategies that overcome this reality must be considered: an atraumatic dental extraction technique, bone regeneration combined with a membrane and immediate implant placement, the flapless immediate implant placement into the fresh molar socket with platelet-rich fibrin (PRF), and the temporary screw on the implant that improves the final esthetic outcome of the peri-implant mucosa are several of the options reported in literature to obtain functional and esthetic results in the maxillary anterior sector.<sup>[4,5]</sup>

The present article reports a clinical case in which the authors performed the atraumatic extraction in a maxillary central incisor, placement of membrane of PRF besides bone graft, and temporalization with an esthetic transitory removable prosthesis.

### Clinical case report

A 45-year-old male patient presented to us who required extraction of tooth #8 due to symptoms of gingival inflammation, oral fistula with exudate underpressure,

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pain, and discomfort for weeks before. On clinical examination, there were swelling, redness, and deep probing of 10 mm in the vestibular zone with purulent liquid originating from the crevicular sulcus; a scar area was observed along the attached gum, which is the product of a previous surgery. Periapical X-ray showed an enlargement of the periodontal ligament in the apex. Apical filling with an alloy metal was observed without relief of symptoms. Imageology examination was complemented with cone-beam computed tomography of the zone, showing a huge zone of bone loss in three-dimensional (3D) aspects of tooth #8. In addition, severe bone loss was observed. Tooth #8 was diagnosed as a chronic periodontal abscess,<sup>[6]</sup> with a bad prognosis [Figure 1]. After the patient signed the informed consent, the surgical intervention was carried out. A Newman flap was designed for the extraction of # 8, the area was detoxified with tetracycline after tooth extraction and irrigated with saline solution to eliminate remaining infected tissue. Once it was confirmed that the buccal wall presented a perforation accompanied by bone loss, the area was filled with particulate xenograft of with particulate xenograft (LuminaBone by Criteria Inc) and a platelet-rich fibrin membrane was placed. A suture with nylon 6-0 was allowed to close the socket, and a hemostatic was used, followed by a aesthetic temporary restoration [Figure 2]. The extracted tooth showed signs of apical corrosion due to retrograde filling and multiple lines of fracture at the root. Finally, the patient was prescribed oral capsules of amoxicillin 500 mg and nimesulide tablets

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100 mg. Control at 8 days and 6 weeks showed good stability of the tissues around the graft and good functional and esthetic condition of the temporary bridge [Figure 2]. The cone-beam tomography showed a bone neoformation at 4 months, with an increase in vestibular bone volume even with the immature bone. The clinical findings accompanied the results in the tomography [Figure 3]. After 8 months of follow-up, there is no relapse of abscess or inflammation in the surgical zone. The gingival tissue showed good healing and the regenerated bone volume was confirmed with CBT.

## Discussion

When it is necessary to perform a dental extraction in the anterior sector of the maxilla, the placement of bone grafts and regeneration membranes allow the installation of a dental implant that meets the requirement of returning function and aesthetics in the patient. An alternative is the use of platelet-rich fibrin (PRF) membranes and bone grafts, which as the case described in this report, allows to obtain optimal results in guided bone regeneration. This concept was expressed by Medikeri *et al.* in 2018.<sup>[7]</sup> The authors presented a case of dental extraction whose socket was regenerated with xenograft and PRF membrane: detoxification of alveolus with tetracycline, bone graft, and PRF graft mixed with bone graft. A coronally positioned flap allowed wound closure and ensured adequate healing. Weigl and Strangio in 2016,<sup>[8]</sup> reported a systematic review in which it was demonstrated that the immediate implant placement and its aesthetic provisional restoration after tooth extraction, allow to obtain promising results. In contrast to the case of the present report, in which the patient was not determined to place an immediate implant. It is better to have options step by step and not to hurry with patients' beliefs or convictions in relation to dental implants. The use of PRF membranes in fresh socket is a promising therapy, which allows obtaining a predictable regeneration in less time and with a comfortable postoperative period for the patient Mourão CF *et al.* (2020). This concept has been supported for the report of de Almeida *et al.* (2020).<sup>[9]</sup> In the case presented, the patient manifested a low level of pain after the surgical procedure. Healing of external tissues showed a pattern of good color, low redness, and good maintaining of the 3D volume of tissues. In a similar way, Fabbro *et al.* in 2014<sup>[10]</sup> established in their systematic review that "results are suggestive for a positive effect of platelet concentrates on bone formation in postextraction sockets." Concept that supports the author's decision to use a platelet concentrate to cover the bone graft placed in the fresh socket as a membrane. The results of the cone beam scan showed the bone regeneration achieved after three months.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

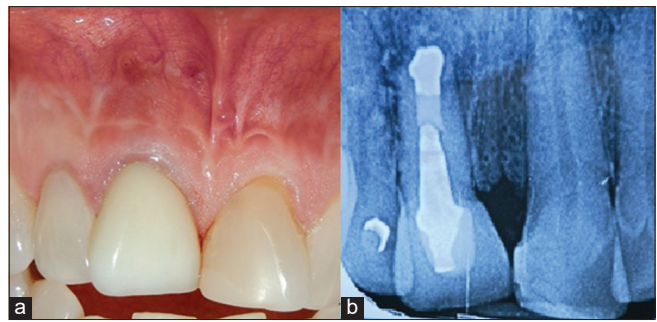


Figure 1: Clinical view. (a) Condition of the gingiva and oral mucous in tooth number 8. Swelling, redness, scar, and vestibular fistulae in the apical zone of the tooth. (b) Periapical X-ray showing a previously apical surgery with retro-obturation in amalgam of silver

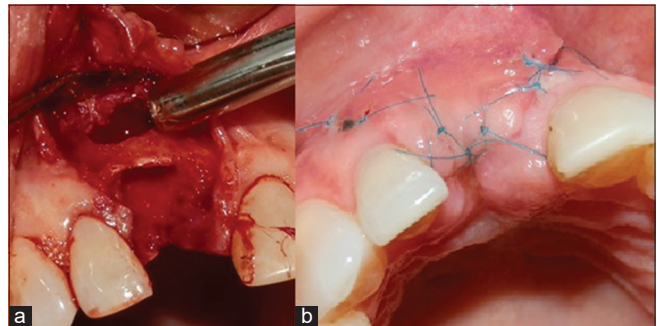


Figure 2: (a) Initial flap elevation respecting papillae. Big and extended lesion in the apical zone of tooth 8, showing a large amount of granulation tissue, with intense bleeding during surgery. (b) Healing aspect of the surgery zone after 8 days of postoperative period. No bleeding, redness, discomfort, and pain manifested in the patient. A good tissue volume can be noted

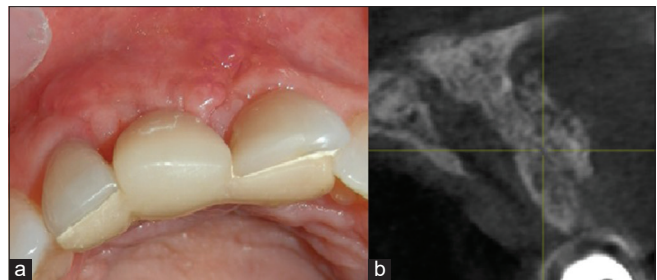


Figure 3: (a) Vestibular view of healing after 6 weeks of surgery. A good tissue volume can be noted. Good color and absence of signs of inflammation. (b) cone beam scan showed excellent bone regeneration after 3 months

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

- Herrera D, Retamal-Valdes B, Alonso B, Feres M. Acute periodontal lesions (periodontal abscesses and necrotizing periodontal diseases) and endo-periodontal lesions. *J Periodontol* 2018;89 Suppl 1:S85-102.
- Yao J, Tang H, Gao XL, McGrath C, Mattheos N. Patients' expectations to dental implant: A systematic review of the literature. *Health Qual Life Outcomes* 2014;12:153.
- Hof M, Tepper G, Semo B, Arnhart C, Watzek G, Pommer B. Patients' perspectives on dental implant and bone graft surgery: Questionnaire-based interview survey. *Clin Oral Implants Res* 2014;25:42-5.
- Sun XL, Mudalal M, Qi ML, Sun Y, Du LY, Wang ZQ, *et al.* Flapless immediate implant placement into fresh molar extraction socket using platelet-rich fibrin: A case report. *World J Clin Cases* 2019;7:3153-9.
- Furze D, Byrne A, Alam S, Brägger U, Wismeijer D, Wittneben JG. Influence of the fixed implant-supported provisional phase on the esthetic final outcome of implant-supported crowns: 3-year results of a randomized controlled clinical trial. *Clin Implant Dent Relat Res* 2019;21:649-55.
- Caton JG, Armitage G, Berglundh T, Chapple IL, Jepsen S, Kornman KS, *et al.* A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification. *J Periodontol* 2018;89 Suppl 1:S1-8.
- Medikeri RS, Meharwade V, Wate PM, Lele SV. Effect of PRF and allograft use on immediate implants at extraction sockets with periapical infection - Clinical and cone beam CT findings. *Bull Tokyo Dent Coll* 2018;59:97-109.
- Weigl P, Strangio A. The impact of immediately placed and restored single-tooth implants on hard and soft tissues in the anterior maxilla. *Eur J Oral Implantol* 2016;9 Suppl 1:S89-106.
- de Mourão CF, de Mello-Machado RC, Javid K, Moraschini V. The use of leukocyte- and platelet-rich fibrin in the management of soft tissue healing and pain in post-extraction sockets: A randomized clinical trial. *J Craniomaxillofac Surg* 2020;48:452-7.
- Fabbro MD, Corbella S, Taschieri S, Francetti L, Weinstein R. Autologous platelet concentrate for post-extraction socket healing: A systematic review. *Eur J Oral Implantol* 2014;7:333-44.