

Implantodontic Rehabilitation After Surgical Removal of Compound Odontoma Followed by the Application of Platelet-Rich Plasma: 20-Years Follow-Up

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Abstract

The installation of osseointegrated implants and the subsequent implantoprosthesis rehabilitation present predictability and longevity. The alveolar process may undergo dimensional changes after tooth loss, complicating implant installation. Additionally, other conditions, such as oral pathologies - like odontoma or periapical lesions - may compromise implant installation. Due to this difficulty, the installation of implants is frequently associated with regenerative procedures, seeking the preservation of the alveolar ridge, bone regeneration and gains in bone tissue height or thickness. The purpose of this article is to present the case about the installation of osseointegrated implants and prosthetic rehabilitation in a region with odontoma. After excision of the lesions, platelet-rich plasma was applied. After 6 months, the patient had osseointegrated implants installed and after 6 months the implant prosthesis was made. The case has been followed for 20 years with the installation of osseointegrated implants and implantoprosthesis rehabilitation of the patient. The complementary benefits of platelet-rich plasma adjacent to the installed osseointegrated implants were discussed.

Keywords: Implantodontic Rehabilitation; Compound Odontoma; Platelet-Rich Plasma

Introduction

The installation of osseointegrated implants and subsequent implantoprosthesis rehabilitation present predictability and longevity. The alveolar process can suffer dimensional changes after tooth loss, complicating implant installation [1]. Additionally, other conditions, such as oral pathologies - like odontoma or periapical lesions - can compromise implant installation [2]. Due to this difficulty, the installation of implants is frequently associated with regenerative procedures, seeking the preservation of the alveolar ridge, bone regeneration and gains in bone tissue height or thickness [1].

Platelets play important roles in the processes of hemostasis, wound healing and bone regeneration. They are responsible for releasing growth factors, such as platelet-derived growth factor

(PDGF), epidermal growth factor (EGF), transforming growth factor-beta (TGF- β), and vascular endothelial growth factor (VEGF). Additionally, platelets also release cytokines, chemokines, adhesive proteins, procoagulant factors and other molecules involved in the processes of chemotaxis; angiogenesis; immune response; cell differentiation and proliferation; soft tissue and bone repair and healing [1,3-13]. In this perspective, platelet-rich plasma presents platelet concentration 2 to 5 times higher, promoting the acceleration of physiological activities [1,14].

Purpose of the Study

The purpose of this article is to present the case of the installation of osseointegrated implants and prosthetic rehabilitation in a region with odontoma. After excision of the lesions, platelet-rich plasma was applied. The patient underwent osseointegrated im-

plant installation and an implant prosthesis was made. The case has been followed for 20 years.

Case Report

A Caucasian female patient, 37-years-old, came to the clinic for rehabilitative treatment with osseointegrated implants.

Clinically, the absence of teeth 11, 12, 13, 21, 22 and 23 was observed (Figure 1). The patient presented satisfactory oral condition and oral hygiene. A history of surgical removal of compound odontoma followed by application of platelet-rich plasma 6 months ago was reported.



Figure 1: Patient presenting clinical absence of teeth 11, 12, 13, 21, 22 and 23.

No systemic change has been reported.

From the sections obtained by linear tomography (Figure 2) and radiographic study, the surgical planning for the installation of osseointegrated implants was performed. Table 1 summarizes the quantitative values of the measurements performed on the linear tomography slices.

Region	Bone height (mm)	Bone thickness (mm)
13	17,8	3,0
12	16,8	2,8
11	14,8	2,8
21	14,8	2,0
22	17,3	1,2
23	19,0	1,8

Table 1: Measurements of bone heights and thicknesses from the slices obtained in the linear tomography.

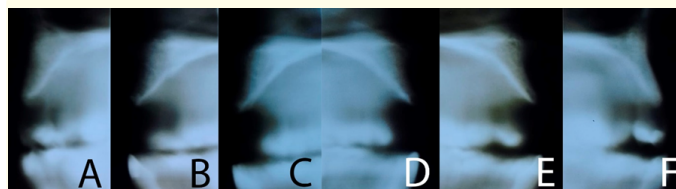


Figure 2: Sections obtained by linear tomography. Tooth region 13 (A); 12 (B); 11 (C); 21 (D); 22 (E); 23 (F).

The surgical-rehabilitation procedure was proposed and explained to the patient. After clarification of all questions, the patient signed the consent form to perform the proposed treatment.

Under local anesthesia, an incision was made on the crest of the alveolar ridge, with two relaxers on the teeth 14 and 24. The mucoperiosteal flap was detached, presenting the entire ridge in the edentulous region. The milling recommended by the manufacturer was performed for implant installation, followed by maxillary expansion with Summers osteotomes (Figure 3). Four 3.5 X 13 mm implants (Internal Hexagon™, Dentoflex, São Paulo, Brazil) were installed in the regions of teeth 11, 13, 21 and 23 (Figure 4). The flap was repositioned and sutured (Figure 5). Analgesic, anti-inflammatory and antibiotic drugs were administered.

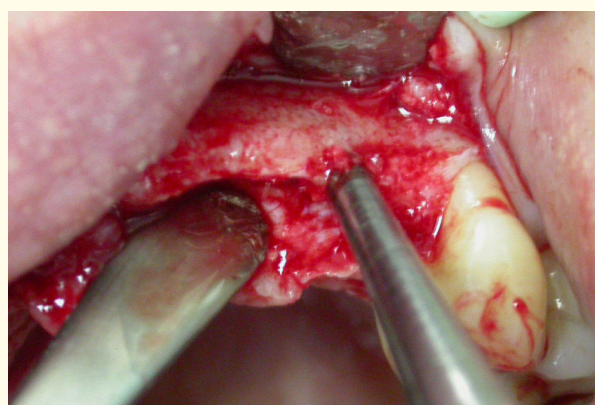


Figure 3: Maxillary expansion with Summers osteotomes.

After 15 days, the sutures were removed. No complaints or complications were reported. However, 30 days after the surgical procedure, suppuration and mobility of the implants were observed in the regions of teeth 13 and 23, indicating implants loss. The im-

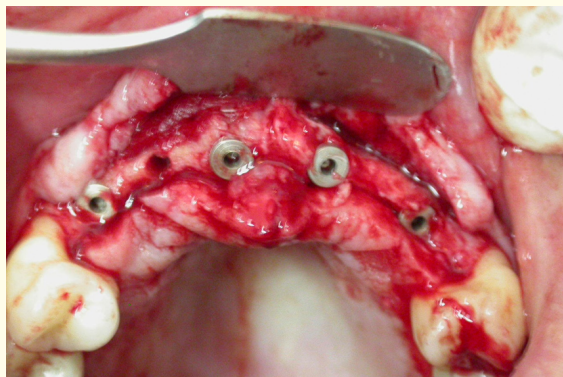


Figure 4: Four implants installed in the regions of teeth 11, 13, 21 and 23.

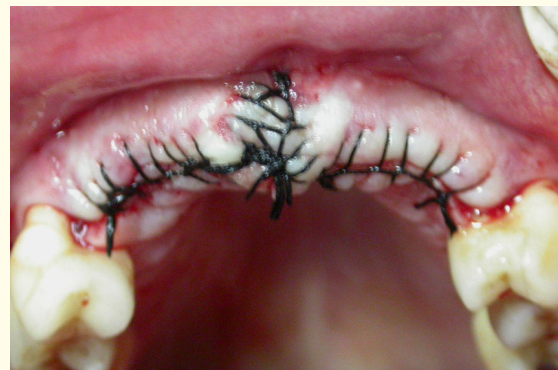


Figure 5: Flap repositioned and sutured.

plants were removed and re-installation was recommended for the patient. However, the patient declined the reinstallation procedure. It was then suggested the prosthesis joined between teeth (14 and 24) and implants (11 and 21). The doubts and clarifications were elucidated and the patient agreed and signed the consent form to perform the procedures.

After 6 months of the osseointegration process, the prosthetic phase was initiated. A reopening was performed through an incision on the alveolar ridge and the healing abutment were installed, defining the emergence gingival profile of the prostheses. Due to the loss of implants in the regions of teeth 13 and 23, the new planning included the preparation of teeth 14 and 24 (Figure 6), defining the fixed implantodontal prosthesis. Transfer moulding was performed, and copings and metallic infrastructure were fa-

bricated (Figure 7). Color evaluation, ceramic application, try-in of the prosthesis were the next steps until the installation of the prosthesis (Figure 8). The patient was satisfied with the final result. Since it is a fixed prosthesis, the patient was oriented regarding oral hygiene procedures.

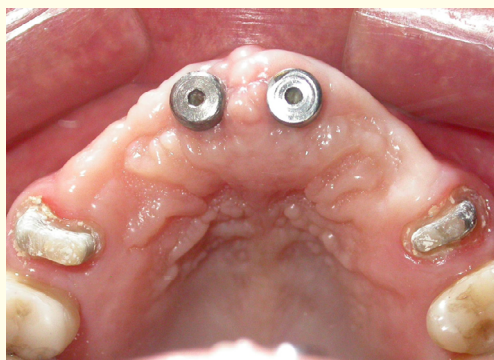


Figure 6: Healing abutment installed and preparation of teeth 14 and 24.

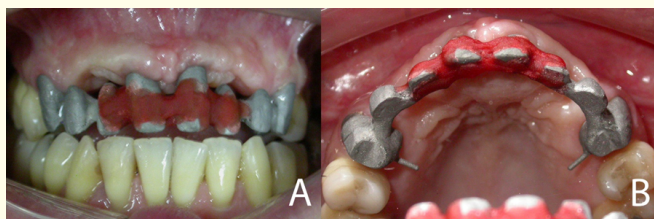


Figure 7: Metallic infrastructure installed in the oral cavity: frontal view (A); occlusal view (B).

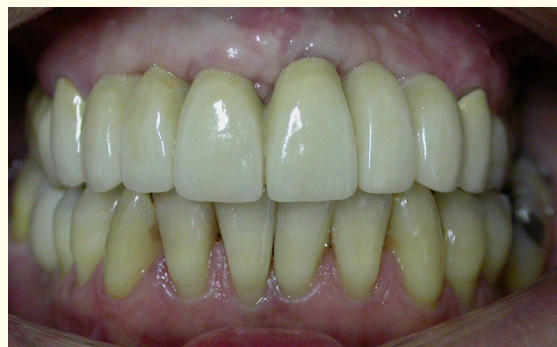


Figure 8: Prosthesis installed.

The patient has been followed up for 20 years, with twice-yearly periodontal and peri implant care. Routine radiographic evaluations are performed and followed up for 20 years (Figure 9).

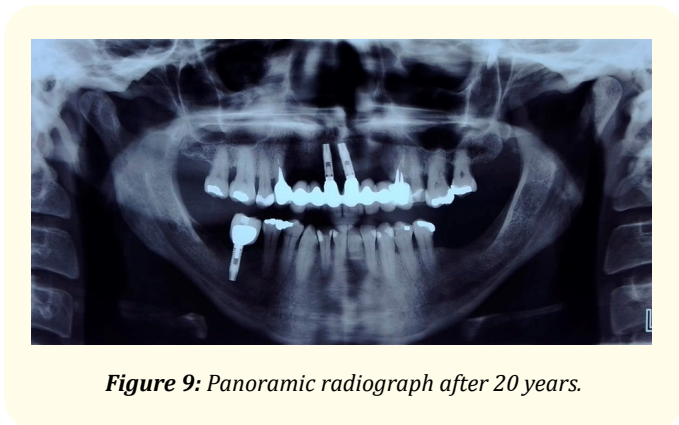


Figure 9: Panoramic radiograph after 20 years.

Discussion

The use of platelet-rich plasma in Dentistry is intended for surgical procedures with the proposal of bone tissue augmentation. Indications include use after exodontia, alveolar osteitis, perimplant and periodontal bone defects, maxillary sinus lift. As previously reported by Chagras, *et al.* (2022) [3] after surgical removal of compound odontoma, platelet-rich plasma can still be employed in the field of Oral and Maxillofacial Pathology. Platelet-rich plasma has been used in bone cavities arising from surgical removal of cysts, benign tumours, oronasal fistula, drug-related osteonecrosis or osteoradionecrosis [2,4-9,11,13,15-19].

In the case presented, platelet-rich plasma was applied in a bone cavity after surgical removal of a compound odontoma, with future installation of osseointegrated implants and implantoprosthetic rehabilitation. Particularly in Implant Dentistry, an increase in soft and hard tissue regeneration is observed. Table 2 synthesized the benefits reported in the literature [4,9,11,14,16,18,20].

Procedure	Benefits
After tooth extraction	Better soft tissue healing; Greater bone regeneration; Greater osteoblastic activity; Less post-surgical painful symptomatology; Antimicrobial activity against some micro-organisms.

Alveolar osteitis	Faster bone coverage; Less inflammatory process.
Bone augmentation and bone gain surgeries; Maxillary sinus lift surgeries; Installation of osseointegrated implants	Bone gain in thickness and height; Greater bone augmentation; Greater angiogenesis; Greater bone density; Less marginal bone loss adjacent to the implants.
Intraosseous periodontal defects	Greater horizontal bone gain in grade II furcation defects; Better clinical results in clinical insertion level and probing depth when associated with scaling and root planing procedures; Reduction in pain symptomatology.

Table 2: Benefits raised by the PRP.

Associated with other bone graft biomaterials, platelet-rich plasma showed osteoinductive properties adjacent to implants installed immediately after dental extractions, stimulating bone acceleration and maturation. Additionally, faster soft tissue coverage was observed, accelerating gingival epithelialization [14].

Platelet-rich plasma seems to be currently in disuse. On the other hand, fibrin-rich plasma has been more widely used [3,7,19]. Considering the knowledge and technology of that time, 20 years ago, the reported case presented several benefits, from acceleration and maturation of bone tissue after surgical removal of the compound odontoma, as well as bone gain for the future installation of osseointegrated implants. Despite the loss of the implants in the regions of teeth 13 and 23, the implantodontal prosthesis presented with favourable masticatory function and aesthetics. Likewise, the installed osseointegrated implants (Internal Hexagon™, 3.5 X 13 mm, Dentoflex, São Paulo, Brazil) present longevity in function, determining successful treatment and favouring the quality of life of the patient.

Conclusion

The present case demonstrates that, despite the technical limitations of the time, such as the use of linear tomography and the

use of PRP, it is possible to promote longevity in function and aesthetics. Even making the fixed implantodontal prosthesis with this unfavourable union, but using quality osseointegrated implants, and maintaining routine care, it is possible to offer an increase in the quality of life of the dental patient. Platelet-rich plasma is no longer used as before, but it is important as a precursor technique of the current use of fibrin-rich plasma.

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