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Implant placement after alveolar ridge preservation through Bartee technique: A case report

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Abstract

Alveolar ridge preservation is a set of surgical techniques to preserve the volume of the alveolar ridge that exists at the time of extraction. The loss of height and alveolar thickness can be treated with alveolar preservation techniques, therefore, they have a better prognosis for placing a restoration, specifically an implant. Case report: A 61-year-old male patient diagnosed with a dental fracture and an insufficient clinical crown in the tooth 1.4 compromising its restoration, an alveolar bone preservation was performed with Bartee technique and a dental implant was placed with the healing screw immediately, avoiding stage II of healing, for which a satisfactory gingival result was obtained and without evidence of bone loss at 3 months. Conclusion: Today there are multiple alternatives for the placement of unitary dental implants, where the alveolar ridge preservation with Bartee technique provides multiple clinical benefits in the face of unfavorable scenarios for the placement of immediate implants.

Keywords: Dental implant, alveolar preservation, alveolar ridge

1. Introduction

After tooth extraction, atrophy of the alveolar bone crest occurs, being one of the greatest challenges for the periodontist, since it compromises three-dimensionality, primary stability, aesthetics and function when planning a dental implant [1, 2]. Alveolar bone resorption after dental extraction is inevitable and continues during the life of the patient, that is why surgical methods have been sought to avoid collapse that compromises the rehabilitation of the edentulous area [3].

Alveolar ridge preservation is the surgical procedure performed at the time of tooth extraction [4], with the aim of preserving the alveolar dimensions and contours. Today, there are numerous alveolar ridge preservation techniques with different materials, which favors the successful and predictable treatment of dental implants [5].

In alveolar ridge preservation with Bartee technique, a primary closure of the wound is not necessary, as it uses a dense membrane of expanded polytetrafluoroethylene (e-PTFE) with low porosity and does not allow the growth of the surrounding tissues [6].

The aim of the present study is to report the diagnosis of a patient with dental fracture and periapical lesion and its clinical management to place a dental implant through alveolar ridge preservation with Bartee technique.

2. Case Report

2.1 Case description

A 61-year-old male patient who attended the Graduate Periodontics Program, School of Dentistry of the Autonomous University of Nuevo León to evaluate the tooth 1.4. In the clinical history, the patient does not present a pathological or nonpathological background, which is why it was classified as ASAI [7].

On the intraoral examination, the patient presented multiple amalgam and composite restorations in the posterior area of both arches, a fixed bridge of 2.5 to 2.7. In the tooth 1.4 presents a fracture of the palatal cusp and dental caries.

In the radiographic analysis of piece 1.4, slight horizontal bone loss, widening of the space of the periodontal ligament and periapical lesion is observed, so it was indicated to take a cone

beam computed tomography (CBCT) having a vestibular-lingual length of 9.23 mm and an apical length from the bony crest > 16.17 mm (Fig. 1).

In his periodontogram, periodontal pockets of 4 and 5 mm were found, being diagnosed with generalized mild chronic periodontitis, for which the hygienic phase of the treatment was indicated, including scalling, plaque control and root planning. After that, the placement of an implant in the dental organ 1.4 with previous alveolar ridge preservation was planned with the Bartee technique.

2.2 Alveolar ridge preservation

After asepsis and antisepsis, an intrasulcular incision was made around 1.4 with a no. 15c knife and the atraumatic extraction was performed with the use of periostomes (PT1 and PT2, Hu-Friedy®) (Fig. 2B), one was placed 12 x 24 mm e-PTFE membrane (TXT 200, Cytoplast™) which was cut out extending 3 to 4 mm from the margins of the alveolus and 1 mm adjacent to the roots (Fig. 2C) and a particle xenograft was placed 1 - 2 mm previously hydrated (Zcore™, Osteogenics) until reaching the bone crest (Fig. 2D), then the alveolus is closed with the membrane (Fig. 2E) and sutured with 4-0 vicryl cross-shaped and interrupted sutures in the papillae (Fig. 2F).

a) Indications and postoperative evaluation

Postoperative indications were amoxicillin 500 mg every 8 hours for 7 days, ibuprofen 400 mg every 6 hours for 5 days and a rinse of chlorhexidine gluconate at 0.12% in solution, doing a rinse 2 times a day for 15 days.

After 7 days, an inflamed tissue was observed and the distal papilla was detached; the sutures were removed after 14 days and the membrane was removed after 28 days without the need for local anesthesia, showing a bright red tissue with a tendency to hemorrhage (Fig. 3).

2.3 Dental Implant placement

After 8 months of alveolar ridge preservation, a CBCT was taken with the radiographic guide, having a length of 8.74 mm in the vestibulo-palatal direction in the most coronal part of the alveolar ridge, and 22.57 mm in the most apical part and >13.13 mm in the corono-apical direction (Fig. 4).

Once anesthetized, a crestal incision was made following the fundamental groove of the adjacent teeth and an intrasulcular incision in 1.3 and 1.5, a full-thickness flap was reflected (Fig. 5); subsequently, it was milled following the pattern of the surgical guide with the pilot drill and the JD Evolution milling protocol (Fig. 6), to place a 3.7x11.5 mm implant, which due to the primary stability obtained was placed a screw of healing of 4x3 mm, was sutured with simple points with vicryl 4-0 (Fig. 7).

a) Indications and postoperative evaluation

Amoxicillin of 500 mg every 8 hours for 7 days, ibuprofen of 400 mg every 6 hours for 5 days and a rinse of chlorhexidine gluconate at 0.12% in solution were prescribed, doing a rinse 2 times a day for 15 days. He was also asked not to brush the treated area, but to clean it with a swab impregnated with chlorhexidine gluconate.

The sutures were removed after 7 days, and inflammation of the tissue was observed. However, after 14 days, a pale pink, firm and stable gingival tissue was found. Three months postoperatively, the patient was in excellent gingival conditions and, radiographically, no bone loss was found beyond what was considered normal due to bone remodeling

after surgery (Fig. 8).

3. Discussion

One of the advantages of alveolar ridge preservation with Bartee technique is that, when exposed, it reduces the need for vertical incisions, thus favoring vascularity at the surgical site, and the e-PTFE membrane prevents premature degradation associated with the exposure of absorbable membranes, allows to preserve the architecture of soft tissues and does not allow the growth of surrounding tissues^[8].

In this case it was decided to place the healing screw during the osseointegration stage of the implant. It has been demonstrated that there are no statistically significant changes in bone level at three years in submerged implants (0.68 mm) and implants with healing screws (0.58 mm)^[9], which is consistent with other studies, where a success rate has been reported and survival of 92 and 99% respectively in non-submerged implants^[10]. Sánchez-Siles *et al.* evaluated the placement of healing screws during the osseointegration stage of dental implants, where they found that the clinical benefits are to avoid a second surgery to discover the implant, minimize mucogingival changes, avoid occlusal loads for the osseointegration, ensure a means of healing for the oral environment and is recommended in previous regenerative procedures^[11].

3.1 Figures



Fig 1: CBCT and periapical radiography of 1.4

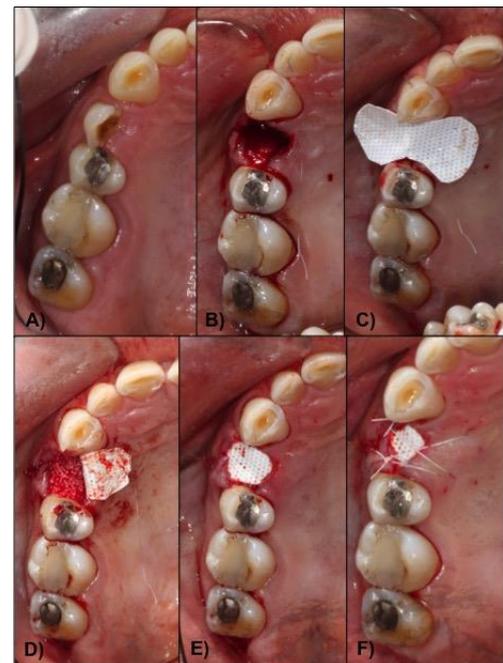


Fig 2: Alveolar ridge preservation with Bartee technique. A) Initial photograph, B) Atraumatic extraction, C) TXT 200 membrane test, D) Bone graft placement, E) Closure of the alveolus with the membrane, F) Suture with vicryl.

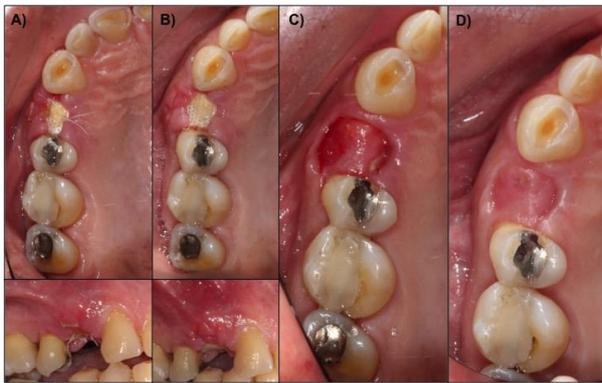


Fig 3: Post-surgical healing, A) 7 days, B) 14 days, C) 4 weeks, D) 8 weeks.

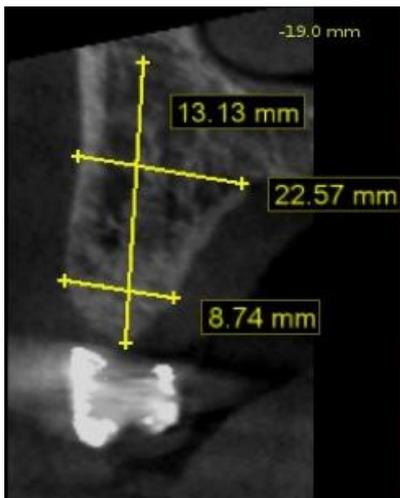


Fig 4: CBCT of 1.4 at 8 months post-surgical procedure.



Fig 5: Surgical guide test, incision and elevation of the flap 8 months after the alveolar ridge preservation.

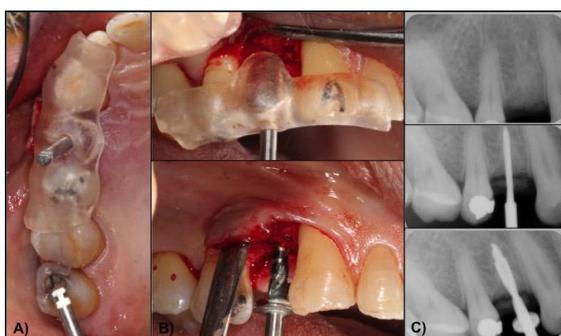


Fig 6: Placement of dental implant, A) Pilot drill following the parameter of the surgical guide, B) and C) Milling of the dental implant.

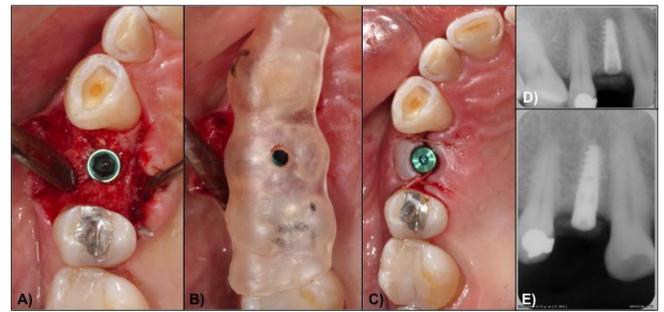


Fig 7: A) Dental implant placed, B) Placement of the surgical guide on the implant, observing centered, C) Placement of healing and suture screw with vicryl, D) X-ray of the implant placed before, E) Implant with the healing screw.

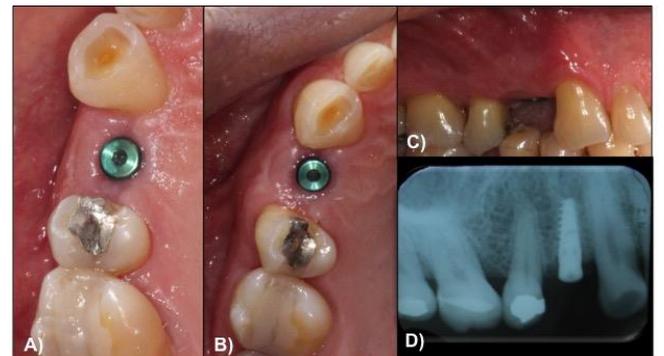


Fig 8: A) Post-surgical healing at 14 days, B) and C) Clinical evaluation at 3 months after, D) Periapical radiograph of control at 3 months post-surgical.

4. Conclusions

In conclusion of this clinical case of a patient with dental fracture and insufficient clinical crown in the tooth 1.4, which an alveolar ridge preservation was performed with Bartee technique and a dental implant was placed, a soft and hard tissue preservation was obtained, in addition to a primary stability and three-dimensionality when placing the dental implant. It is important to perform clinical and radiographic monitoring and periodontal maintenance every 3 months uninterrupted throughout the process.

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