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Case Report

Immediate implant placement by using natural bovine bone substitute with hyaluronate

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Abstract: Sufficient bone volume is important to allow proper implants osseointegration. The aim of this case report was to observe an immediate implant placement by using xenograft granules with hyaluronate and without any membrane coverage. The augmentation areas were assessed 3 months later during final crown installation and after 1 year and 6 months of implant loading. Satisfactory implant stability, granules osteointegration into newly formed bone, as well as stable soft tissue supported by the granules were observed.

Keywords: Immediate implant placement, natural bovine bone, hyaluronate

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Introduction

The alveolar ridge height and width are crucial for dental implant placement in the upper and lower jaw [1]. Many bone augmentation techniques exist to compensate for horizontal and vertical alveolar ridge deficiency [2]. In case of dimensional changes following tooth loss, a flapless immediate implant placement seems to provide some advantages for both patient and clinician [3], [4].

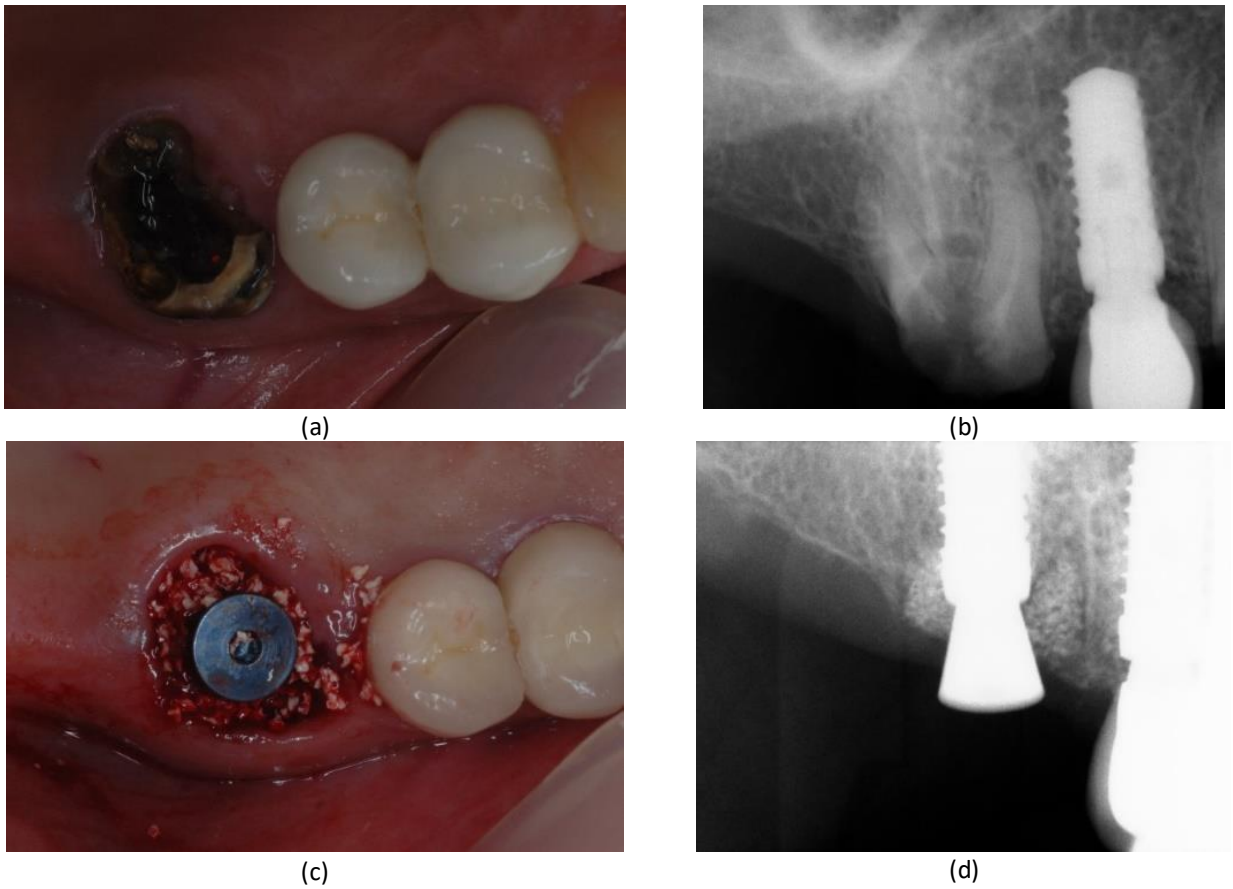
Different treatment concepts have been proposed to protect the bone volume at the immediate implant site. The gap grafting between the implant and buccal bone wall by bone substitutes has been tested in several clinical studies [4]–[6]. Natural bovine bone substitute with hyaluronate has been created to achieve better handling, faster cells proliferation, vascularization, and better clinical outcomes [7]–[9]. However, no clinical studies demonstrated the use of such biomaterial without any membrane coverage.

The aim of this clinical case was to observe immediate implant placement by using xenograft granules with hyaluronate and without any membrane coverage. The augmentation areas were assessed 3 months later during final crown installation and after 1 year and 6 months of implant loading.

Materials and Methods

A 43-year-old female patient, nonsmoker and without health problems, presented with broken crowns on teeth #16 and #26, as the teeth roots had caries with furcation involvement (Figure 1, 2). Therefore, the treatment plan consisted of a tooth extraction with immediate implant placement. The atraumatic flapless extractions were performed under local anesthesia (Septanest 1/100,000 epinephrine) by using periotomes and after roots separation. Consequently, two

implants (4.5/10 ContacTI®/VEGA, KLOCKNER, Madrid Spain) with healing abutments were installed. Then the gaps between the implants and the bone were filled with natural bovine bone substitute with hyaluronate (cerabone® plus; botiss biomaterials GmbH, Zossen, Germany) and without any membrane coverage, as no sutures were required. Post op medications were: Augmentin 1g 2 times/day, Solpadeine every 6 hrs, Paroex 0.12% 3 times /day for 2 weeks.

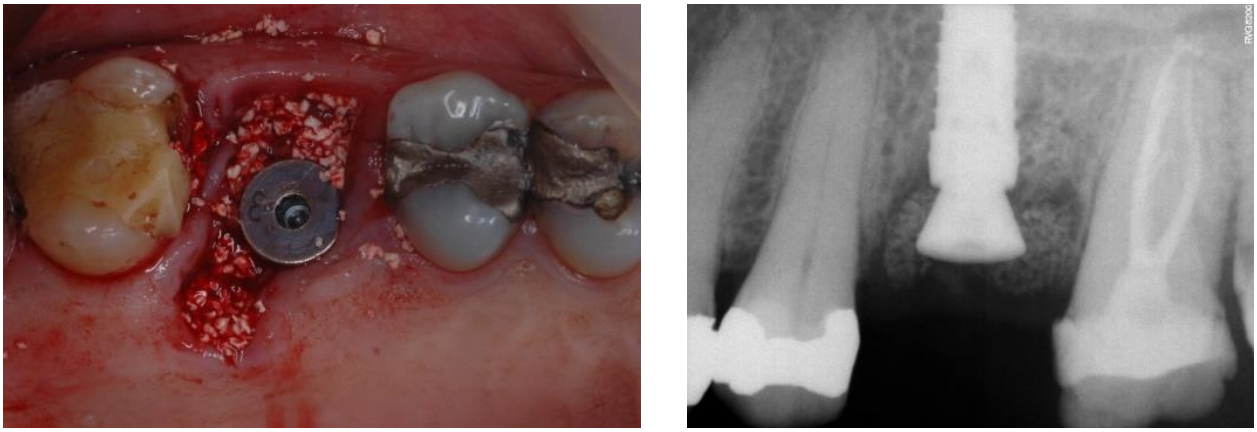


(a) (b)

(c) (d)

Figure 1. Tooth #16: (a) Occlusal view; (b) Periapical radiographic image, with presence of root carious lesion and furcation involvement; (c) Immediate implant placement and grafting in the gap between the implant and the bone with cerabone® plus; (d) Periapical radiographic image at immediate implant placement time.

(a) (b)

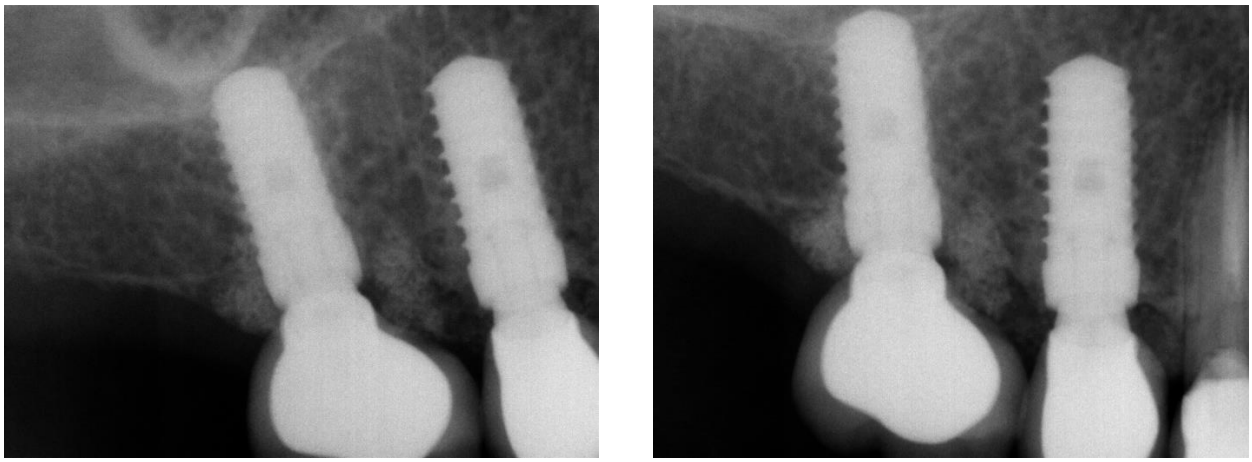


(c) (d)

Figure 2. Tooth #26: (a) Occlusal view; (b) Periapical radiographic image, with presence of deep decay furcation involvement; (c) Immediate implant placement and grafting in the gap between the implant and the bone with cerabone® plus; (d) Periapical radiographic image at immediate implant placement time.

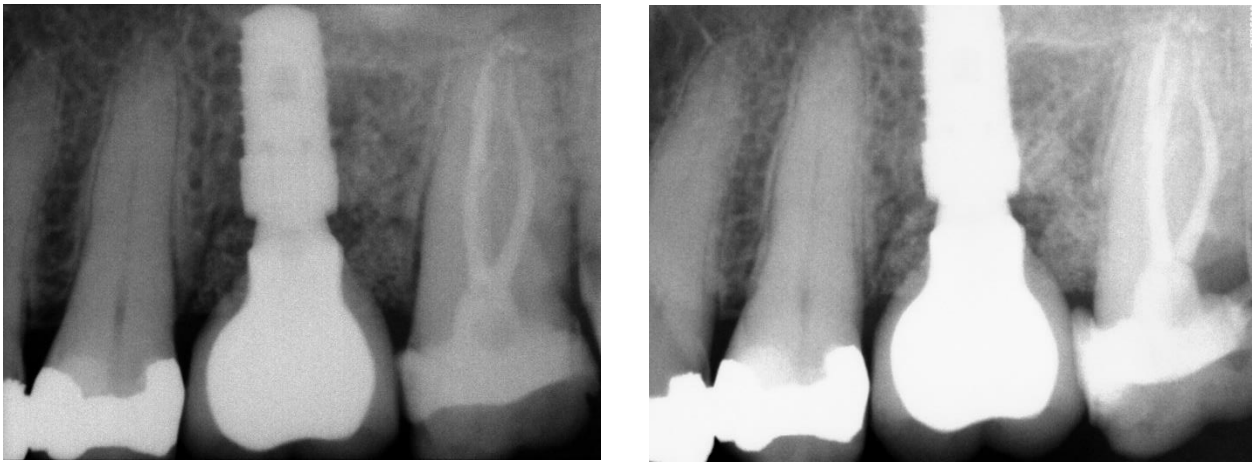
Results

The assessment of the augmentation areas was based on periapical radiographic images made 3 months later during final crown installation and after 1 year and 6 months of implant loading (Figure 3, 4). A sufficient implant stability, granules osteointegration into newly formed bone, as well as stable soft tissue supported by the granules was observed.



(a) (b)

Figure 3. Periapical radiographic images of tooth #16: (a) Final crown 3 months after implantation; (b) After 1 year and 6 months of implant loading.



(a) (b)

Figure 4. Periapical radiographic images of tooth #26: (a) Final crown 3 months after implantation; (b) After 1 year and 6 months of implant loading.

Discussion

This case report confirms successful immediate implants placement by using xenograft granules with hyaluronate and without any membrane coverage. A sufficient implant stability, granules osteointegration into newly formed bone, as well as stable soft tissue supported by the granules was observed by the end of the treatment.

The regeneration biomaterials are frequently used in the orthopedic and implant dentistry [10]. The guided bone regeneration is a surgical procedure that uses bone grafts and barrier membranes to eliminate the soft tissue infiltration within the grafting material [11]. Here, the socket condition, implant location, and healing situation play a crucial role in the implant survival process. Even though the patient's own bone is considered to be the gold standard grafting material, different synthetic or naturally-derived biomaterials are used to simplify the grafting procedure [12]. Especially the bovine derived xenograft granules in combination with hyaluronate provide better handling at the grafted site due to the sticky consistency [13]. This also leads to faster cells proliferation and vascularization compared to the xenograft granules alone [7], [8]. The hyaluronate is a fast degrading material then allows osteoconductive bone regeneration, as well as a treatment of a variety of soft tissue indications [14], [15]. Such sticky bone combination has already been successfully used in peri-implantitis reconstructive therapy [9].

For that reason, we performed and immediate implants placement by using xenograft granules with hyaluronate. The wetting enabled sticky consistency, as the gaps between the implants and the bone were easily filled without any membrane coverage, also no sutures were required (Figure 1, 2). A sufficient implant stability, granules osteointegration into newly formed bone, as well as stable soft tissue supported by the granules were observed 3 months later during final crown installation and after 1 year and 6 months of implant loading (Figure 3, 4).

Conclusions

In this case report we achieved successful immediate implants placement by using xenograft granules with hyaluronate and without any membrane coverage. Three months later during final crown installation and after one year and six months of implant loading, a satisfactory implant stability, granules osteointegration into newly formed bone, as well as stable soft tissue supported by the granules were observed. To verify these results, more patients should be treated with the same method and materials.

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Board review and informed consent statement: The local authorities allow publication of such cases after a written informed consent is given by the patients.

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