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Case Series

Immediate implant placement using xenograft with hyaluronate and collagen fleece

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Abstract: The bone contour maintenance after immediate implant placement can be quite challenging. The aim of this clinical case series was to evaluate the performance of xenograft granules in combination with hyaluronate and collagen fleece during immediate implant placement. All five patients have been analyzed after 5-6 months and satisfactory implant stability, aesthetics, and function were achieved. Such treatment can provide predictable patients outcome.

Keywords: Immediate implant placement, xenograft, hyaluronate, collagen fleece

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Introduction

In the world of dental aesthetics, the use of dental implants to replace missing teeth has become a daily routine [1]. However, it is a requirement to have sufficient bone and soft tissue around the implant to achieve proper aesthetics and functionality [2]. To make sure this happens, different ways of implantation such as immediate, early or delayed have been proposed [3].

The immediate implant placement not only saves time, also reduces morbidity, and is supported by strong evidence [4]. However, the post-extraction sites quite frequently undergo dimensional changes which is why various grafting materials have been used in parallel with immediate implant placement [5]. Recently xenograft granules in combination with hyaluronate have been introduced with a purpose to achieve faster cells proliferation, vascularization and to improve the outcomes in clinical settings [6]–[8]. The collagen fleece is primarily used to stop bleeding and support wound healing [9]. This is due to the collagen's hemostyptic reactivity, which causes blood clots to develop quickly [10].

The aim of this retrospective case series was augmentation with xenograft granules / hyaluronate combination into the bone defects around immediately placed implants. All five patients had their wound stabilized with collacen fleece and were analyzed minimum 5-6 months after treatment.

Materials and Methods

Five patients were treated with immediate implant placement by using xenograft with hualuronate (cerabone® plus, botiss biomaterials GmbH, Zossen, Germany) and collagen sponge (collafleece®, botiss biomaterials GmbH, Zossen, Germany) (Table 1). The patients were randomly treated after providing informed consent and then were retrospectively analyzed. All treatments were performed according to the Declaration of Helsinki 2013 and the local health authorities allow such publications without additional demands.

Table 1. Overview of patients

	Recorded follow-up
Patient 1	6, 18, 20 months
Patient 2	6 months
Patient 3	6 months
Patient 4	6 months
Patient 5	5 months

All patients were presented with missing bone which required tooth extraction. After atraumatic teeth extraction, an immediate implant placement was performed (Figure 1).

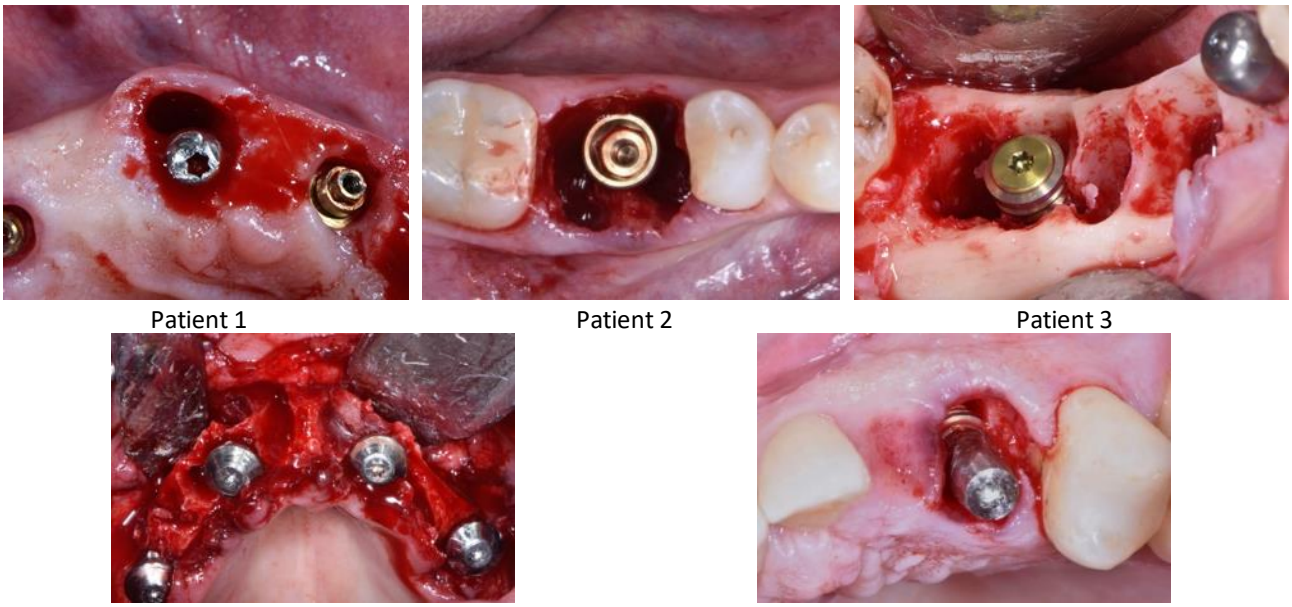

Figure 1. Immediate implant placement.

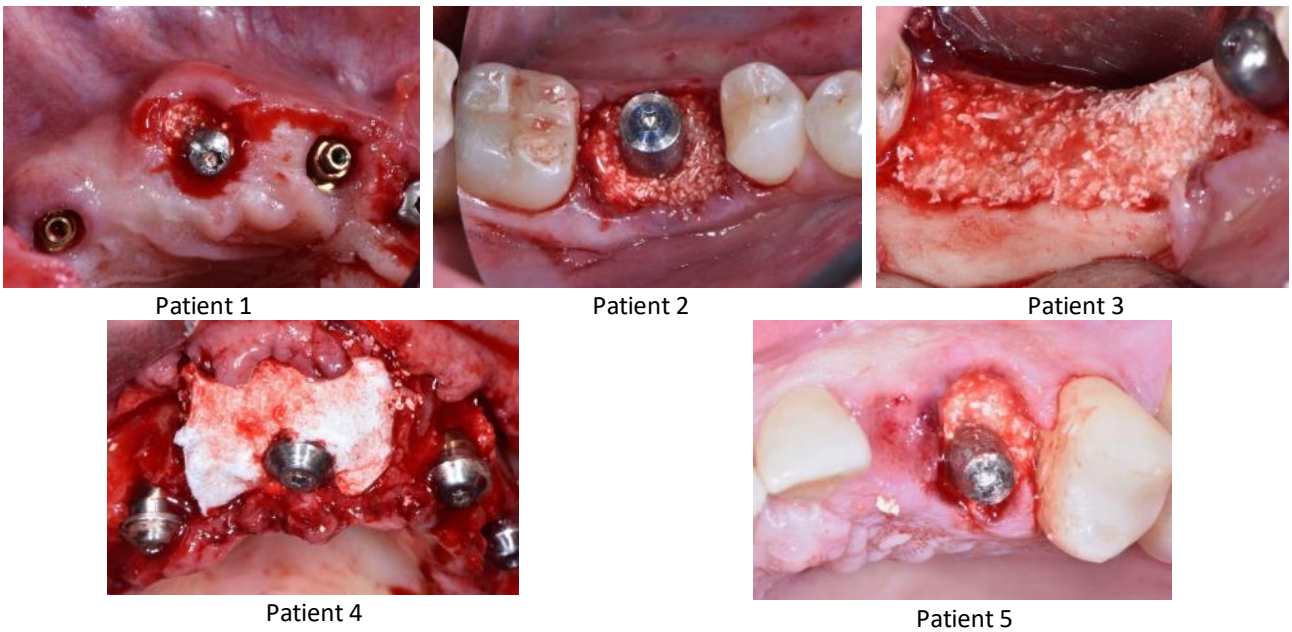

Figure 2. Augmentation with the grafting material.

Due to a presence of bone defects around the implants, we performed an augmentation with the grafting material after it was hydrated according to the manufacturer instructions (Figure 2). Here the creation of a sticky consistency after wetting enabled easy handling of cerabone® plus. The wound was then stabilized with collafleece® after adapting few layers of this collagen sponge around the inserted abutment. The sutures were finally placed, and the collagen sponge was partially left exposed (Figure 3).

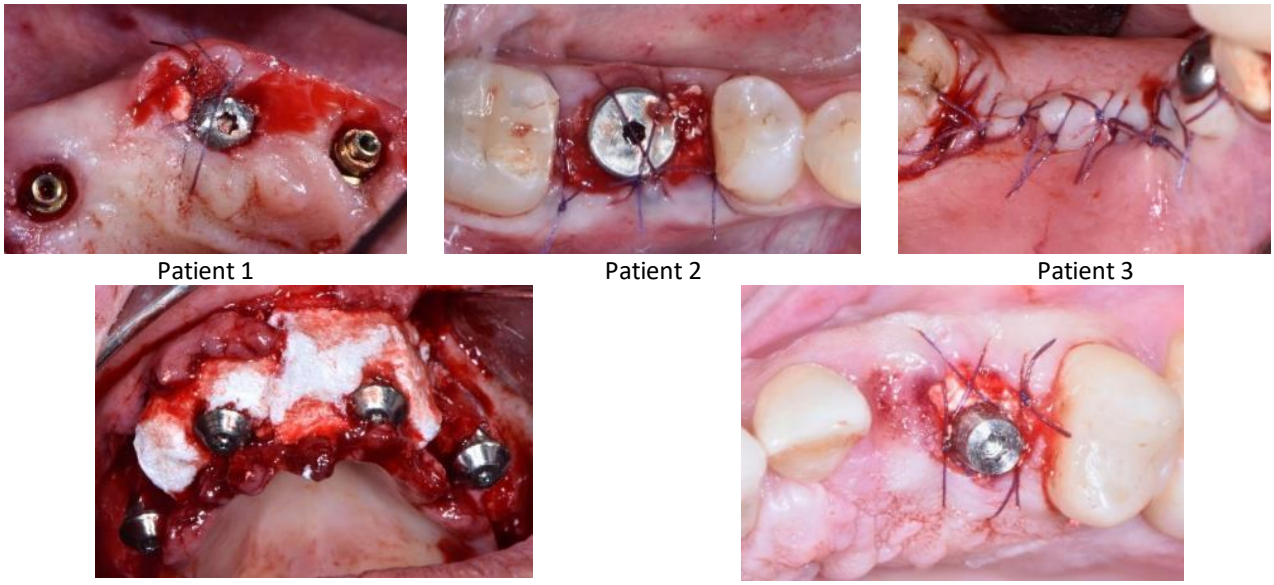

Figure 3. Wound stabilization after application of collagen sponge.

Results

All five patients had successful post-op healing and stable implants integration due to osseointegration of cerabone® plus after 5-6 months. The satisfactory soft tissue situation was also recorded (Figure 4-8).

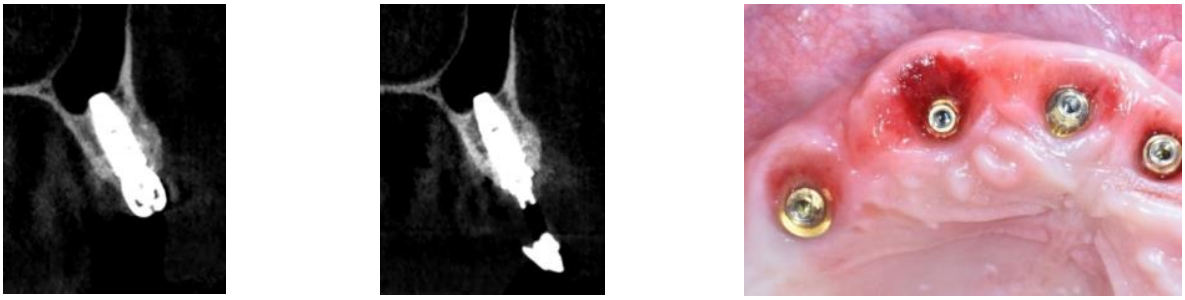

Figure 4. Patient 1: Follow-up after: (a) 6 months; (b) 18 months, (c) soft tissue situation after 20 months.

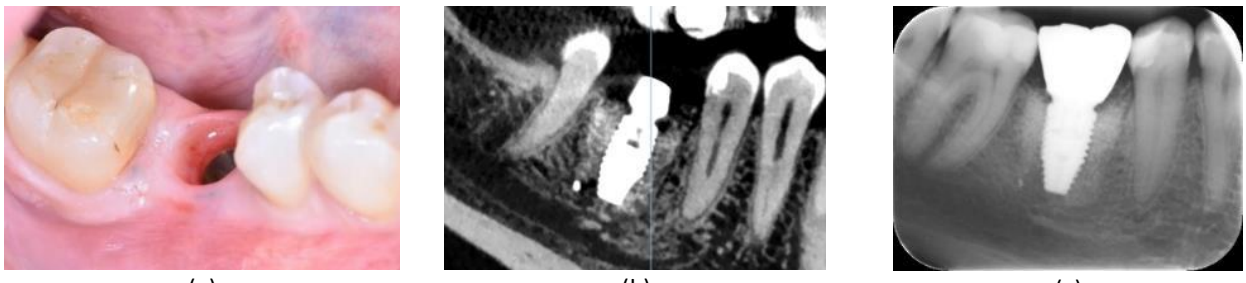

Figure 5. Patient 2: Follow-up after 6 months: (a) soft tissue situation; (b) osseointegration of cerabone® plus, (c) stable implant integration.

(a) (b)

Figure 6. Patient 3: Follow-up after 6 months: (a) soft tissue situation; (b) osseointegration of cerabone® plus and stable implant integration.

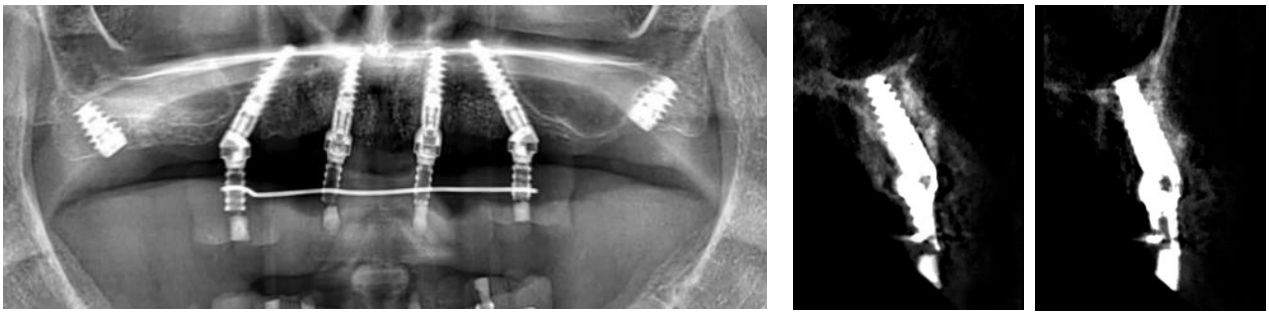

Figure 7. Patient 4: Follow-up after 6 months, osseointegration of cerabone® plus and stable implants integration.

(a) (b)

Figure 8. Patient 5: Follow-up after 5 months: (a) soft tissue situation; (b) osseointegration of cerabone® plus and stable implant integration.

Discussion

This case series confirms successful immediate implant placement by using xenograft with hyaluronate and collagen fleece. The overall outcome in all patients was a success in terms of implant stability, aesthetics, and function.

Bone regeneration procedures are widely present and indicated in the field of implant dentistry [11]. It is known that Guided Bone Regeneration (GBR) could be considered as a separate surgical procedure which precedes implant placement, as simultaneous procedure with implant placement is also an option [12]. Nowadays, simultaneous approach is more desired due to time savings, morbidity reduce due to decrease of surgical procedures, and strong evidence which supports such approach [4]. Post-extraction sites are always connected with bone remodeling which is a consequence of post extraction dimensional changes being influenced by the buccal bone wall thickness, soft tissue biotype, and

presence/absence of dehiscence or fenestrations [13]. Also, the socket status and healing pattern play an important role in such a process.

Various grafting materials have been used in parallel with immediate implant placement to enhance implant stability and augment missing bone [5]. However, within the recent years the xenograft granules in combination with hyaluronate has attracted significant attention due to adding better consistency and ability to adapt the grafted site [8]. This also allows better handling and eliminates any possible granulate sharpness. It is well known that hyaluronate leads to faster cells proliferation and vascularization compared to the xenograft granules alone [6], [7]. The in-vivo degradation of hyaluronate is less than 2 weeks, then allowing the xenograft particles to support osteoconductive bone regeneration [14]. Such xenograft/hyaluronate combination can improve the clinical and radiographic outcomes in peri-implantitis reconstructive therapy [8].

For that reason, we performed an augmentation with such grafting material into the bone defects around immediately placed implants in all five patients. The sticky consistency after wetting enabled easy handling of cerabone® plus and then collafleece® collagen sponge was used to cover around the inserted abutments. This collagen fleece can be partially left exposed and had the role of supporting the soft tissue healing. All patients were presented with successful post-op healing as stable implants integration and satisfactory soft tissue situation was recorded after 5-6 months.

Conclusions

Achieving implant stability, aesthetics, and proper function during immediate implant placement can be a challenging task. Here we report satisfactory treatment in five patients that received immediate implant placement by using xenograft with hyaluronate and collagen fleece. They all had successful post-op healing, stable integration, and soft tissue appearance after 5-6 months. More patients should be treated with the same approach to verify the long-term results and success rate.

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Board review and informed consent statement: The patients provided informed consent and the local health authorities allow such publications without additional demands.

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