

Hard and soft Tissue Augmentation after Immediate Implantation in Anterior Maxilla with Multi-Disciplinary Approaches; A Clinical Report

Dr. Jawad Abdel-haq*
Dr. Eyad Abou Asali**

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□ ABSTRACT □

Aesthetic restoration of anterior teeth in maxilla after *immediate* implant placement is one of the most difficult procedures to execute. Resorption of the buccal wall of the extraction socket may lead to significant disadvantages, especially in the anterior part of the maxilla. In this case report we insert implants immediately in fresh Socket. fenestrations or dehiscences of the bone walls and a residual gap between implant surfaces and surrounding bone walls were augmented with bone graft. An average facial gingival tissue recession of 1 mm is still common after one year of function in immediate implantation.

The purpose of this clinical article is to describe a grafting technique using subepithelial connective tissue grafts and free gingival palatal graft to recontour soft-tissue margin discrepancy for implants restorations after 10 month of immediate placement in the anterior maxilla.

Key words : oral surgery, immediate implantation, hard & soft tissue augmentation

* Assistant Professir, maxillofacial surgery department, International university for science and Technology.

** Assistant Professir, maxillofacial surgery department, International university for science and Technology.

الترميم بالنسج الرخوة والصلبة بعد الزرع الفوري للقواطع العلوية بتقنيات مختلفة، دراسة سريرية

الدكتور جواد عبد الحق*

الدكتور إياد أبو عسلي**

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□ ملخص □

إن تأمين الناحية التجميلية للأسنان الأمامية في الفك العلوي بعد الزرع الفوري هو واحد من أكثر الإجراءات صعوبة. إن امتصاص الجدار الدهليزي للسنخ العظمي بعد القلع يؤدي إلى عيوب كبيرة ، لا سيما في الجزء الأمامي من الفك العلوي. في هذه الحالة السريرية نقوم بزرع فوري في الأسناخ العظمية بعد القلع . تمت معالجة العيوب العظمية لجدران السنخ أو الفراغ المتبقي ماحول الزرعة باستخدام الطعوم العظمية. إن الانحسار اللثوي بمعدل 1 ملم ما زال شائعا بعد عام واحد من الاستخدام الوظيفي للزرعة. تهدف هذه الحالة السريرية لوصف أسلوب التطعيم باستخدام الطعم الضام والبشري لاعادة تشكيل الأنسجة الرخوة حول زرعات الأسنان الأمامية الفورية بعد 10 أشهر.

الكلمات المفتاحية: جراحة الفم، الزرع الفوري، الترميم بالنسج الصلبة والرخوة.

*مدرس - قسم جراحة الفكين - الجامعة الدولية الخاصة للعلوم والتكنولوجيا.

** مدرس - قسم جراحة الفكين - الجامعة الدولية الخاصة للعلوم والتكنولوجيا.

Introduction:

The exceptions were Schropp and associates, who defined immediate implantation as implants placed between 3 and 15 days (mean 10 days) following tooth extraction, Gomez-Roman and coworkers, who defined it as occurring between 0 and 7 days afterward. The majority of studies that described delayed implant placement used a delay period of 4 to 8 weeks after extraction. In a report published by Hammerle and Lang, placement was delayed for 8 to 14 weeks. In an additional 3 reports, implant placement was considered delayed when it occurred between 6 weeks and 6 months after extraction and between 1 week and 9 months [1,2,3,4,5,6,7].

Most of the studies reviewed described immediate implant placement as part of the same surgical procedure and immediately following tooth extraction. The advantages of immediate implant placement have been reported to include reduction in the number of surgical interventions and in the treatment time required. It has also been suggested that ideal orientation of the implant, preservation of the bone at the extraction site, and optimal soft tissue esthetics may be achieved [7,8,9,10,11,12,13].

Several classifications have been proposed for the timing of implant placement following tooth extraction. In the classification of Wilson and Weber, the terms *immediate*, *recent*, *delayed*, and *mature* are used to describe the timing of implant placement in relation to soft tissue healing and the predictability of guided bone regeneration procedures.¹⁴ However, no guidelines for the time interval associated with these terms were provided. In the recent classification of Mayfield, the terms *immediate*, *delayed*, and *late* are used to describe time intervals of 0 weeks, 6 to 10 weeks, and 6 months or more after extraction, respectively.³ The interval between 10 weeks and 6 months was not addressed [14,15].

The basic prerequisites for successful bone healing in immediate and delayed implant sites are the same as for implants placed in healed alveolar ridges. The bone healing is dependent on stabilization of the initially formed coagulum in this space. Animal experimental studies have shown that both the distance from the bone to the implant and the surface characteristics of the implant are critical factors for stabilization of the coagulum [16,17].

In several studies following observation periods of between 1 and 4.5 years, no significant differences were reported to occur in radiographic crestal bone levels or in probing of pockets at immediate, delayed, or late implantation sites [5,18,19,20].

It is generally believed that the form of the mucosa closely follows the changes in the underlying bone. An apical shift in the coronal bone may be followed by a similar shift in the position of the mucosa. However, in a study comparing healing of undisturbed sockets with healing of sockets grafted with freeze-dried bone allograft and a collagen membrane, the authors reported that the thickness of the mucosa at the buccal aspect of the ridge crest increased by 0.4 mm after 4 months in the control group. The grafted group showed a loss of tissue thickness of 0.1 mm. The differences between test and control groups were significant [21].

Although complete epithelialization of the socket is established by the fifth week of healing, organization and maturation of the collagen in the underlying lamina propria takes longer to occur. Matrix synthesis begins at 7 days and peaks at 3 weeks; this is followed by a continuous process of maturation until complete tensile strength is restored several months later [22]. Lack of tensile strength in the mucosa of healing extraction sockets may result in wound dehiscence. Dehiscence rates of 5% to 24% have been reported at delayed

implant sites treated with both resorbable and nonresorbable membranes, despite the presence of adequate tissue volume to achieve primary closure [23].

CLINICAL EVALUATION:

Pretreatment patient communication determined that this 50-year-old female patient was in excellent systemic health, with previous hospitalizations only for the birth of 3 children. No Cigarette smoking.

These communications revealed a state of advanced periodontal disease, loose teeth. patient had successes history of implant treatment in the upper left side before 6 years ago.

The examination revealed missing teeth in the anterior maxilla , advanced loss of supporting bone, and generalized tooth mobility. Dental diagnoses included tooth mobility and advanced periodontitis,

CLINICAL TREATMENT:

Implant placement

One hour before surgery each patient was given a single dose of 5 mg diazepam, 4 mg betamethasone, and 2 g amoxicillin. Acetaminophen (750 mg) was prescribed every 6 hours for 2 days for pain control.

Full mucogingival flap reflection and left lateral, central and canin incisors in right side and left central and lateral incisors tooth extraction was performed under local anesthesia (fig1). The bone quality was determined clinically at the time of implant placement by the surgeon to be quality 2 according to the classification established by Lekholm and Zarb.

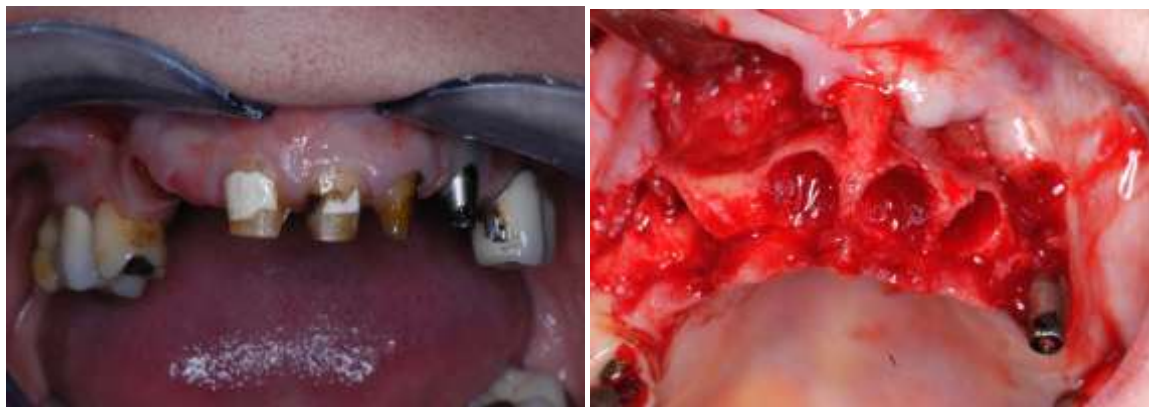


Fig1: Shows the case before and after extraction and reflecting flap.

Four implant were placed according to the manufacturer's protocol (FRIALIT, Dental Implant System). Briefly, a supracrestal horizontal incision was accomplished and complete with distal vertical incision preserving the papillae from the adjacent tooth. Mucoperiosteal flaps were raised the maxillary bone was inspected the mandible bone was inspected, planed with cutting burs, and the recipient beds were prepared under abundant irrigation with sterile saline solution (Fig 2).

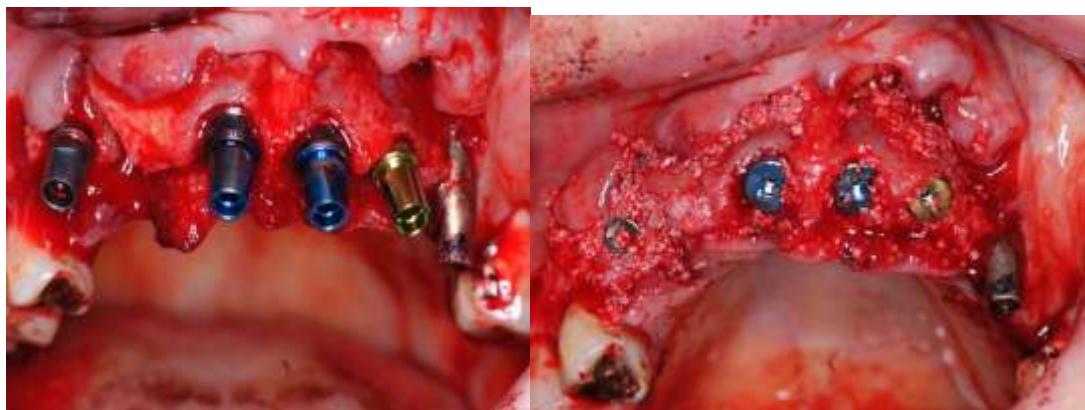


Fig 2: shows inserting implant with Bio-Oss graft.

The implants were then placed at 1-2 mm under of level of alveolar crest and palataly. In the marginal buccal-approximal and palat side space occurred between the implants and the socket walls was grafted by Bio-Oss(®)(Fig 2). .

The flaps were repositioned and sutured with 5.0 nylon monofilaments so that the cover screw was completely exposed . The sutures were removed after 1 week. The plaque control protocol was established with local application and rinses with 0.12% chlorhexidine digluconate solution twice daily during the period of wound healing. The patients were recalled for professional plaque control weekly in the first month and then monthly until the end of the study.

Loading protocol was performed for new and old implants after 4 month of healing. metal-ceramic crowns or fixed partial dentures were fabricated. The fixed restorations were cemented by zinc phosphate (Fig 3).



Fig 3: shows the steps of impression

After connection of the suprastructure, patients were recall and checked after 6 months, the result of clinical examination had show that the Recession in buccal gingival occured in left lateral 2 mm and in left central 1 mm and in right central 2 mm and in the canin 1 mm. loss of papilla occurred between tow central (Fig 4).



Fig 4: shows the loss of papilla between central incisor

The use of an epithelialized palatal graft for the treatment of a mucogingival defect has enjoyed a long history of a predictable success. This technique can be used for covering denuded root surfaces. In general a grafting technique using free gingival graft and subepithelial connective tissue grafts to recontour soft-tissue margin discrepancy for implant restorations in the anterior maxilla. In the first step frenullectomy was performed to elimination of mobile of the soft tissue and reduce the length of frenulum in anterior of maxilla (Fig 5).



Fig 5: shows the preparation of frenulum site.

To made free gingival grafting, the recipient site was preper by doing partial-thickness horizontal incision just coronal to the level of soft tissue augmentation desired, and vertical incision from lateral aspect extended apically. Sharp dissecting is performed apically to create a rigid periosteal recipient bad. for donor site, palatal premolar and molar region wae selected to taken graft. Partial thickness incision was made by donig bevel vertical access incision at anterior. Adson tissue forceps was used to apply traction to the tissue at the access incision and sharped dissecting is used to harvest a uniform graft. gingival graft adaption to the recipient side and immobilization was performed by suture

placement in the each papillary area and peripherally area . after 10 day we removed the suture (Fig 6).

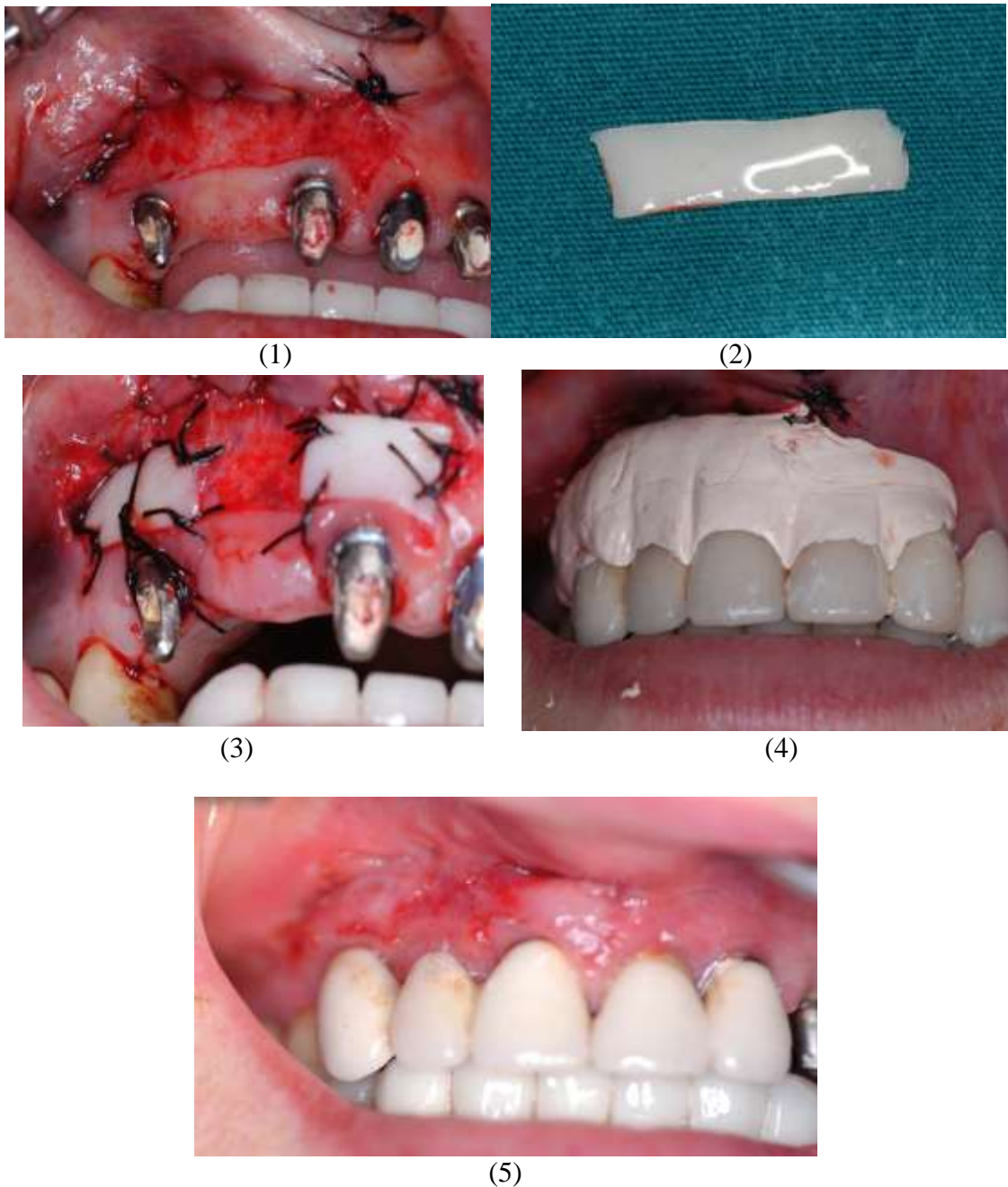


Fig 6: (1) the preparation of the bed of the frafft, (2) the free epithilum graft, (3) the soft graft after sututre, (4) the pack, (5) the result .

After one monthe of graft free gingival on anterior of masilla, the subepithelial connective tissue grafts was performed. The subepithelial connective tissue graft is an extermaely versatile procedure to enhance soft tissue contours aroud implants and provide predivtable soft tissue coverage of exposed abutment sufaces and it can maske the gray metakic volor that can penetrate the thin soft tissue surrounding an implant restoration.

We started by preper the recipient side with implant exposure and delivery of custom abutment and provisional restoration. Partial-thickness incisions was performed than

uniform periosteal recipient site has been prepared on the facial pect of the ridge. In Donor site dual-incision technique was performed and begins with full-thickness curvilinear incision in margins of the premolar, the second , partial-thickness incision was made to the depth of bevel of blade . laste incision was made to parallel the surface (of palatal tissue.and sharp dissection is used to create a subepithelial pouch. the subepithelial connective tissue grafts immediatly transported the preper site, where it attached to horizontal mattress suture (Fig 7).

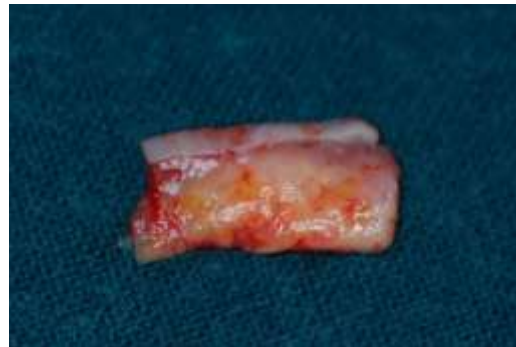


(1)

(2)



(3)



(4)



(5)



(6)



Fig 7: (1)insection to obtain connective graft, (2) reflecting epithilum layer, (3) removing connective graft, (4) the connective tissue graft, (5) the site of the graft, (6) aplaying the graft and suturing , (7) the result.

DISCUSSION:

The purpose of this clinical case is to describe a grafting technique using subepithelial connective tissue grafts and free gingival palatal graft to recontour soft-tissue margin discrepancy after 10 month of immediat placement in the anterior maxilla. *In this case* facial gingival tissue recession of 1 mm is seen after one year of function in immediate implantation *after loading of implants*.

Esthetics are frequently cited as a reason for immediate implant placement'. Adjunctive techniques to mobilize flaps and to augment soft tissue volume for wound closure at immediate implant sites may be beneficial in achieving acceptable esthetic results.

Timing of implant placement following tooth removal may be important to take advantage of soft tissue healing but without risk of losing bone volume through resorption. Delaying implant placement for several weeks after tooth extraction allows time for bone regeneration to occur at the base and periphery of the socket thereby reducing the dimensions of the changes in marginal hard and soft tissue. When implant placement is delayed for a period of time after tooth extraction' soft tissue healing may provide opportunities to maximize tissue volume to achieve proper flap adaptation and acceptable soft tissue esthetics.

A free gingival palatal graft was used to correct the soft tissue defects and provide optimal peri-implant health in order to increase the long-term prognosis of the implant reconstruction [24].

Shibli JA et in clinical study shows that the use of connective tissue grafts can be a predictable approach to establish new and stable peri-implant soft-tissue margin [25]. And in other clinical report demonstrates that the use of soft tissue grafts to correct an esthetic deficiency may be a feasible approach to establish new and stable peri-implant soft tissue contours [26].

Kan JY et all in clinical study suggest that favorable implant success rates, peri-implant tissue responses, and esthetic outcomes can be achieved with immediately placed and provisionalized maxillary anterior single implants [27].

This case report we evaluated the implant success rate, peri-implant tissue response, and esthetic outcome of immediately placed and provisionalized maxillary anterior implants.

Our clinical report suggest that the use of Immediate placement can be achieve after good evaluation for soft tissue quality. Epithelialized palatal grefts can be used predictably for increasing the width of attaced soft tissues and to correct the soft tissue defects. This caes presents solutions that most clinicians commonly use when placing implants in the esthetic zone.

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