

Immediate placement and restoration of a new innovative fully-tapered implant replacing central and lateral incisors: A clinical case report

Karim Dada¹, Léon Pariente², Marwan Daas³ and Julien Montenero⁴

Introduction

Placing an implant immediately after tooth extraction offers several advantages including a reduced treatment time, fewer surgical sessions, possibility of implant fixed temporization, preservation of soft tissue contour and also of the interdental papillae. Immediate implant placement into fresh extraction sites has been described to be a predictable and successful procedure when proper protocols and case selection are followed. The success of immediate implant placement and temporization procedure relies greatly on sufficient primary stability of the implant. The latter depends on the volume of available bone beyond the root apex as classified by Kan et al. and on the choice of the implant, its macro-design and the drilling protocol. BLX implants (Straumann, Switzerland) were designed to achieve high primary stability when placed immediately after extraction.

Initial situation

A 52-year-old man, non-smoker in good general health, was referred after the diagnosis of post-traumatic resorption that affect the root of teeth #11 and #12 (Fig. 1a, Fig. 1b). The patient had a previous consultation with an endodontist who stated that both teeth were hopeless and therefore the extraction was required.

Clinical examination revealed a full healthy periodontium on tooth #12 with no sign of infection. On tooth #11 a slight tissue edema associated with chronic irritation in front of the extensive resorption was appreciated.

Intermaxillary relationship were normal and the analysis of the smile showed a low smile line (Fig. 2).

Tooth #21 was already replaced by an implant-supported crown.

The previously prescribed Computerized Tomography showed that the resorption process was more advanced on tooth #11 (Fig. 3).

Treatment plan

Teeth #11 and #12 were diagnosed as hopeless. From a periodontal point of view the clinical situation was considered as favorable for an immediate implant procedure: gingival margin and papillae are at the same level on these teeth than on the

¹ Karim Dada, Dr. DDS, MS
Private practice, Paris, France

² Leon Pariente, DDS
Private practice, Paris, France

³ Marwan Daas, DDS PHD
Private practice, Paris, France

⁴ Julien Montenero
Private laboratory, Paris, France



Figure 1a

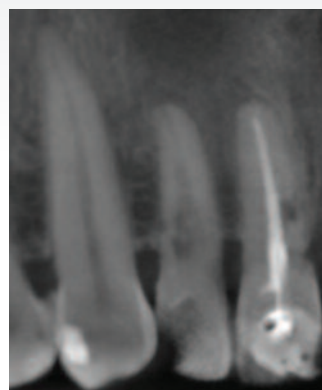


Figure 1b



Figure 2

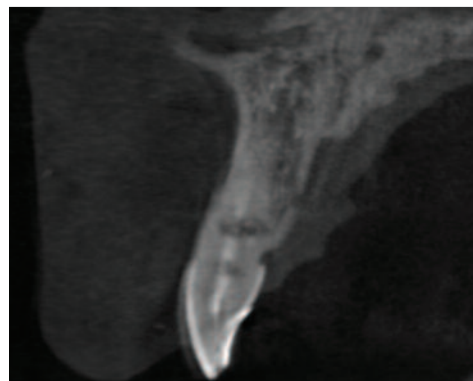


Figure 3

contralateral ones. We used the former CBCT to evaluate the bone volume in the apical area of #11 and #12, as well as the integrity of the buccal plate on both sites (Fig. 4). The examination of the CBCT showed that the buccal plate was intact 3 mm below the gingival level and correlated to the clinical examination the future extraction socket was determined as Class I of Elian(1). The bone volume correlated to the axis of the tooth was considered as favorable for immediate implant placement, Class I of Kan(2). However, we know from literature that adjacent implants in such clinical scenario behave poorly because of the small distance between the platform and that in this kind of situation the probability of the inter-implant papillae loss is quite high. We also know that a staged approach for the extraction of these two incisors will give better result from a soft-tissue point of view (4,5,6,7). According to all these parameters, we decided to go first for an immediate implant placement procedure after extraction of #11. Immediate temporization was intended under the condition of sufficient primary stability of the implant. The implant chosen for this procedure was a Straumann BLX Implant 4.5x12 mm. After a proper healing period, tooth #12 will be extracted and

after a socket preservation procedure and proper soft tissue healing around a temporary prosthesis, a zirconia cantilevered fixed implant supported bridge will replace these two teeth.

Surgical procedure

Immediate implant procedure on #11. Tooth #11 was extracted atraumatically without raising a flap or osteotomy (Fig. 4). The extraction socket was meticulously cleaned and rinsed with Betadine. The drilling sequence included 2.2mm, 2.8mm, 3.2 mm and 3.7mm drills (Fig. 5). The implant was placed with a final Torque of 80 N.cm (Fig. 6, 7). In its final position, the implant platform lied 4 mm under the ideal gingival margin (at the same level of the adjacent implant platform)(Fig. 8). A RB titanium temporary abutment for crown was placed and a laboratory made shell was positioned without interference of the temporary abutment (Fig. 9). The surgical site was protected with a small piece of rubber dam (Fig. 10) and the position of the abutment was connected to the shell with a dual-curing luting composite (Fig. 11). The development of a proper emergence profile will be done extra-orally (Fig. 12) to get



Figure 4



Figure 3



Figure 6



Figure 7



Figure 8



Figure 9

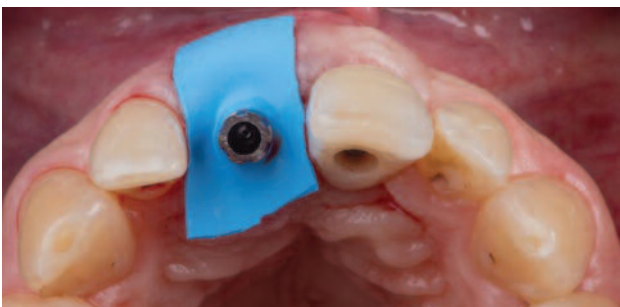


Figure 10



Figure 11

the screw-retained temporary crown.

Before placing the provisional crown, the gap between the implant and the buccal plate was filled with a particulate Xenograft material (Cerabone, Botiss). The graft was packed

up to the gingival margin according to the DualZone principle described by Chu et al (3) (Fig. 13). The screw retained temporary crown was then torqued to 35 N.cm. (Fig. 14)



Figure 12

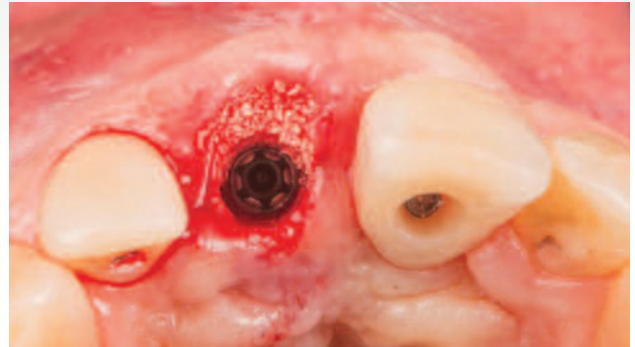


Figure 13



Figure 14



Figure 15

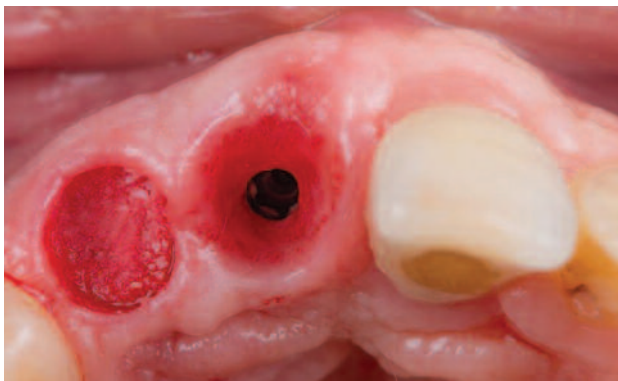


Figure 16



Figure 17

Extraction and socket preservation on #12. Three months after placement, tooth #12 was extracted (Fig. 15) and a socket preservation procedure was applied. The socket was filled with a particulate Xenograft material (Cerabone, Botiss) (Fig. 16) and closed with a free gingival graft taken from the tuberosity (Fig. 17). A cantilevered temporary bridge was then torqued to 35N.cm.

Prosthetic procedure

2 months after #12 extraction, an implant level impression

was taken for final restoration using a digital scan body (Fig. 18) and a digital intraoral scanner (Trios, 3Shape). A zirconia cantilevered fixed implant supported bridge was done according to a full Digital workflow (Fig. 19, 20).

The screw-retained zirconia cantilevered fixed implant supported bridge was then torqued to 35N.cm. (Fig. 21, 22).

Follow-up 10 months after implant placement showed a well-preserved gingival contour (Fig. 23,24)



Figure 18

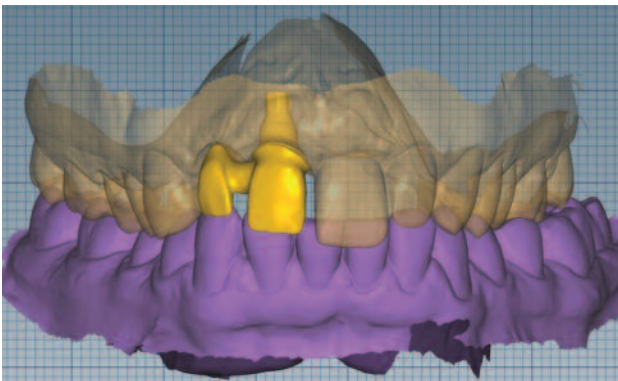


Figure 19

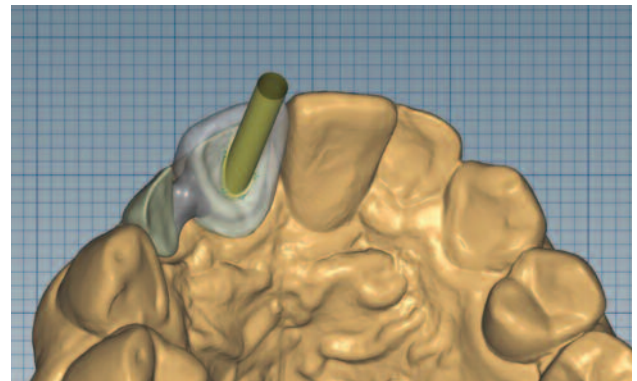


Figure 20



Figure 21



Figure 22



Figure 23



Figure 24

Treatment Outcome

Immediate implant placement and temporization, when

properly indicated has three main advantages: timing, biology and prosthetic.

Treatment time and number of surgical procedures are reduced compared to a delayed approach.

From a biological stand point, using a slow-resorbing material to fill the gap between the implant and the buccal plate allows to predictably preserving the bone volume. The provisional crown supports the gingival architecture and helps maintaining the pre-existing positions of the gingival margin as well as mesial and distal papillae.

When replacing multiple adjacent teeth and when it's possible a staged approach for the extractions will give better result and the use of cantilever can allow a better soft tissue preservation in case of reduced width.

Prosthetically, placing an implant retained provisional crown on the day of surgery simplifies the temporization in the anterior area, allowing the patient to leave the office on the same day with a fixed provisional.

The success of this procedure relies on three basic principles: proper indication, atraumatic extraction and sufficient primary stability of the implant. The latter depends widely on the choice of the implant design and drilling protocol, which should be thought for greater primary stability.

References

1. Elian N, Cho SC, Froum S, Smith RB, Tarnow DP. A simplified socket classification and repair technique. *Pract Proced Aesthet Dent*. 2007 Mar;19(2):99-104
2. Kan JY, Roe P, Rungcharassaeng K, Patel RD, Waki T, Lozada JL, Zimmerman G.; Classification of sagittal root position in relation to the anterior maxillary osseous housing for

immediate implant placement: a cone beam computed tomography study. *Int J Oral Maxillofac Implants*. 2011 Jul-Aug;26(4):873-6.

3. Tymstra N, Meijer HJ, Stellingsma K, Raghoobar GM, Vissink A. Treatment outcome and patient satisfaction with two adjacent implant-supported restorations in the esthetic zone. *Int J Periodontics Restorative Dent*. 2010;30:307-316.

4. Tarnow DP, Cho SC, Wallace SS. The effect of inter-implant distance on the height of inter-implant bone crest. *J Periodontol*. 2000;71:546-549.

5. Galardo JF, Cury PR, Sendyk WR. Effect of the vertical and horizontal distances between adjacent implants and between a tooth and an implant on the incidence of interproximal papilla. *J Periodontol*. 2004;75:1242-1246.

6. Rodriguez-Ciurana X, Vela-Nebot X, Segala-Torres M, Calvo-Guirado JL, Cambra J, Mendez-Blanco V, et al. The effect of interimplant distance on the height of the interimplant bone crest when using platform-switched implants. *Int J Periodontics Restorative Dent*. 2009;29:141-151.

7. Vela X, Mendez V, Rodriguez X, Segala M, Tarnow DP. Crestal bone changes on platform-switched implants and adjacent teeth when the tooth-implant distance is less than 1.5 mm. *Int J Periodontics Restorative Dent*. 2012;32:149-155.

8. Chu SJ, Salama MA, Salama H, Garber DA, Saito H, Sarnachiaro GO, Tarnow DP; The dual-zone therapeutic concept of managing immediate implant placement and provisional restoration in anterior extraction sockets. *Compend Contin Educ Dent*. 2012 Jul-Aug;33(7):524-32, 534.

Reprinted with permission by Stargel June 2018