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Evaluation of Immediate post-extraction implants of 34 patients in Basrah province.

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Abstract

The aim of this study was to evaluate the success rate of the immediate post-extraction implants without incision or primary flap closure.

Patients and Methods: The study included 34 patients in good general health, referred to the department of oral surgery in the specialized center of dentistry in Basra between August 2009 and July 2010, immediate post extraction implant treatment 20(58.82 %) female and 14(41.18%)male, aged 22 to 53 years with mean age 32.85 . Each patient had a tooth that required extraction, and each had at least 4 mm of bone beyond the root apex. After tooth extraction, the implants were immediately placed without incision or flap elevation. Implant sites showing bone bone defects or bone fenestrations, were excluded from this study. The second-stage surgical procedure was performed4 months after the first procedure. The following clinical parameters were evaluated at the time of implant placement and at second stage surgery: peri-implant radiolucency and marginal bone loss, which were evaluated radiographically.

Results: The postsurgical healing period was uneventful for all patients. Soft tissue closure over the implant sites was achieved in1to 3 weeks after surgery at all sites. At second stage surgery, no peri-implant bone defects were observed or detected by probing. The soft tissue anatomy was considered clinically acceptable in all patients.

Conclusions: Immediate post-extraction implant treatment is an implant alternative with a survival rate similar to that of the conventional technique for implant placement and enables preserving both the bone structure and gingival architecture.

Key words: Immediate implant, osseointegration.Dental implant

Introduction

The placement of the implant in a post-extraction bed is a technique that has been developed, especially within the last 10 years (1). Immediate implant placement following tooth extraction in appropriately selected cases has been considered the optimal procedure for the following reasons: the natural healing process are mobilized to the maximum, no bone resorption has taken place yet, drilling is reduced, a number of surgical stages are eliminated, design and construction of prosthesis is simplified, and positive psychological effect on the patient(2).

The primary needs that have led to introducing this protocol are due to the patients' demand to reduce the therapy time, but above all due to the need to preserve the alveolar structures that are

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intended for the reabsorption process following extraction of the tooth (3). after tooth avulsion, there are a series of biological processes that take place: bone reabsorption both vertically as well as horizontally, with a change in the height and thickness of the alveolar bone; gingival collapse; migratory movements of the adjacent teeth(4).

Guided bone regeneration (GBR) for treatment of insufficient bone volume around implants can be performed using membranes with or without grafting materials. Many bone substitutes can be used including autogenous,, xenogenous or alloplastic grafts(5) .

Barrier membranes have been developed to allow guided tissue regeneration by the principle of osteopromotion. The material is chemically and biologically inert. However, non resorbable and resorbable membranes are available in the market (6).

Patients and methods

Thirty four patients 20femaleand14 male, aged 22 to 53 years were included in this study. All patients willing to participate in the study demonstrated good general health. Heavy smokers were excluded [(7)]. All procedures to be performed were explained, and all patients signed an informed consent form [(8)]. Inclusion criteria for the study were presence of at least 4 mm of bone beyond the root apex, absence of acute signs of infection and absence of systemic pathologies that would contraindicate bone healing around implants[(9)].

In each patient, the intra-arch relationship was evaluated using diagnostic casts. Periapical and panoramic radiographs and computerized tomography scans were also obtained if necessary [(10)].

Immediately before surgery, the patients rinsed for 1 minute with chlorhexidine and were instructed to use this mouthwash twice daily for 4 weeks. Under local anesthesia (2% lidocaine), the teeth were carefully removed and the sockets debrided. No flaps were raised, and no incisions were made [(11)]. The implant sites were prepared with standard drills using the bony walls as a guide. The longest and widest possible implants were placed at the buccal-palatal level of bone crest without considering the bone height at the mesial and distal levels [(12)]. All implants placed showed good primary stability.

All implants used had a microtextured surface (B&B system, cylindrical and conical, Italy). Implant length ranged from 12 to 14 mm; diameter, from 3.5 to 5.0 mm. After implant placement, Soft tissue edges were sutured to protect the implant sites. Antibiotics (500 mg ampiclox 4 times daily for 4 days), anti-inflammatory medication, and chlorhexidine mouthwash were prescribed for all patients. Sutures were removed after 7 days. The patients were seen monthly for prophylaxis.

Implant placement according to tooth position is reported in Table 1. An individualized acrylic resin template was fabricated for each patient. The second-stage surgical procedure was performed 4 months after the first procedure for all Implants sites. A minimal incision was made at the crestal level to remove the surgical screw and place a healing abutment. After varying intervals of time, all implants were restored with single-crown prosthesis. The total follow-up period was 6-18 months from delivery of the prosthetic restoration [(13)].

The following clinical parameters were evaluated at the time of implant placement and at second stage surgery: Presence or absence of implant

mobility. Peri-implant radiolucency and marginal bone loss and this is done by Periapical radiographic examination.

Results

Of 34 implant fixtures, thirteen standard implants (4 mm) ,twelve (5 mm) and nine (3.5 mm) wide implants were placed. Twenty one fixtures were 14 mm in length, and the remaining 13 were 12 mm (Table 1) .

Reasons for tooth extraction were: (55.88%) fracture tooth, (29.41%) endodontic failure and (14.71%) badly carious tooth as shown in (Table 2).The distribution of fixtures according to tooth position is shown in (Table 3). The follow-up period in all 34 cases was 6 months to 18months ,11 patients were followed for 18 months ,22 patients for 12 months and 34 patients for 6 months (Table 4) ,success rate was 100% for all the cases ,that all fixtures were clinically stable and had bone loss of less than 1mm radiographically.

The surgical implant site preparation and implant placement proceeded uneventfully. The postsurgical complaints from the patients were minimal; pain and swelling were the most frequently mentioned symptoms. The postsurgical healing period was uneventful for all patients. Soft tissue closure over the implant sites was achieved within 1 to 3 weeks of surgery for all sites. In 4 cases, exposure of the cover screw occurred late 4 months after implant placement, but no further treatment was needed. At second stage surgery all implants were asymptomatic, immobile, and osseointegrated. No peri-implant bone defects were observed or detected by probing around the implants. Five of 34 implants had excessive bone growth over the implant head. The excess bone was removed with a periodontal curette so that the healing abutments could be connected.

The soft tissue anatomy was clinically acceptable in all patients; additional mucogingival surgery to improve the soft tissue morphology was considered unnecessary. The mucogingival junction did not show any change with respect to the adjacent teeth.

The radiographic examination did not show any peri-implant radiolucency. All implants were deemed successful at 6 months after prosthetic rehabilitation.

Discussion

The placement of an implant immediately after tooth extraction could result in a defect between the implant surface and the surrounding bone walls. The use of barrier membranes with or without graft materials has been recommended to obtain bone regeneration and to prevent soft tissue growth at the bone-implant interface [14,15]. However, the use of barrier membranes may be associated with clinical complications such as bacterial colonization, infection, and impaired bone healing [16,17]. Authors evaluating the effects of GBR procedures found the greatest bone gain in sites not protected by membranes. This was probably related to the reduced risk of oral exposure and the associated detrimental effects on bone healing [18]. The need for barrier membranes should therefore be carefully evaluated. More recently, some authors have demonstrated through a histologic analysis that implants placed immediately after extraction without any regenerative procedures could heal like implants placed in healed or mature bone [19].

The complete soft tissue coverage of implants placed immediately after tooth extraction was considered an important criterion for clinical success[20].

Several surgical techniques have been proposed to obtain soft tissue closure. Unfortunately, none of the techniques published in the literature seems to be superior to the others. The techniques that employ coronal repositioning of the buccal flap could alter the level of the mucogingival junction, the vestibular depth, and the width of keratinized tissue and thereby require additional mucogingival surgery. Lateral repositioning of the buccal flap could potentially cause gingival recession at the level of donor sites[21]. In this study, in which incisions and the displacement of flaps were avoided, osseointegration was achieved for all implants with stability of the soft tissues. In the present study, the reproducibility and repeatability of clinical measurements were assured by the use of a single examiner and use of reference templates, these reference templates provided reproducible measuring sites[22].

The technique used in this study could be used in the presence of peri-implant bone defects capable of spontaneous healing, such as 4-wall bone defects with a bone-to-implant gap not exceeding 2 mm. Careful consideration should be given to the bone defects before placing an implant without incisions and flap elevation[23]. The clinical findings from this and previous studies[24] showed that 100% of peri-implant bone defects with a bone-to-implant gap not exceeding 2 mm and without fenestration or dehiscence had complete bone healing without the application of any regenerative procedures.

This finding suggests that the application of bone reconstructive procedures should be considered for bone defects wider than 2 mm.

Another interesting observation from this study was the excellent soft tissue healing around the immediate implants with a stable mucogingival junction with respect to the adjacent teeth. These clinical results reduced the need for further mucogingival surgery during prosthetic rehabilitation [25].

Conclusions

Immediate post-extraction implant treatment is an implant alternative with a survival rate similar to that of the conventional technique for implant placement and enables preserving both the bone structure and gingival architecture

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Table1.Clinical data of patients and implants.

date	Widthmm	Length mm	tooth	Gender	age	Case no
3/8/2009	3.5	14	Upper1	M	31	**1**
5/8/2009	4	12	Lower 1	M	23	**2**
6/8/2009	5	14	Upper1	F	34	**3**
1/9/2009	3.5	14	Upper 2	M	25	**4**
1/9/2009	4	14	Lower 1	F	36	**5**
3/9/20109	5	12	Upper 2	M	24	**6**
1/10/2009	3.5	14	Lower 1	F	46	**7**
6/10/2009	4	14	Upper1	F	42	**8**
8/10/2009	5	12	Lower 2	M	45	**9**
4/11/2009	3.5	14	Upper1	F	36	**10**
16/11/2009	4	14	Upper 2	F	38	**11**
10/12/2009	4	12	Lower 1	F	28	**12**
12/1/2010	5	14	Upper 1	M	29	**13**
25/1/2010	4	14	Upper 3	F	42	**14**
7/2/2010	5	12	Upper3	F	50	**15**
18/2/2010	5	14	1Upper	F	36	**16**
28/2/2010	4	14	Upper 2	M	31	**17**
3/3/2010	5	12	Upper 2	M	23	**18**
8/3/2010	3.5	14	Lower 1	F	36	**19**
6/4/2011	4	14	Upper1	F	24	**20**
15/4/2010	3.5	12	Lower 3	F	40	**21**
2/5/2010	3.5	14	Upper1	M	45	**22**
3/5/2010	4	14	Upper1	M	36	**23**
24/5/2010	5	14	Lower 2	F	38	**24**
27/5/2010	3.5	14	Upper1	M	28	**25**
3/6/2010	4	14	Upper 3	M	40	**26**
6/6/2010	5	12	Upper2	F	42	**27**
1/7/2010	4	12	Lower 2	F	50	**28**
8/7/2010	4	12	Upper1	F	45	**29**
13/7/2010	5	14	Upper1	M	36	**30**
20/7/2010	3.5	14	Upper 2	M	38	**31**
5/8/2010	4	12	Lower 1	F	28	**32**
9/8/2010	5	12	Upper 1	F	45	**33**
12/8/2010	4	12	Upper 2	F	40	**34**

Table 2. Reasons for tooth extraction.

Total	**Badlycarious**	**Endodontic failure**	**Fracture**	
19 (55.88%)	2 (5.88%)	6 (17.65)%	11 (32.35%)	**central**
8 (23.53%)	2 (5.88%)	2 (5.88%)	4 (11.76%)	**lateral**
7 (20.59%)	1 (2.94%)	2 (5.88%)	4 (11.76%)	**canine**
34 (100%)	5 (14.71%)	10 (29.41%)	19 (55.88%)	**Total**

Table 3.Implant location according to tooth position .

Total	**Mandible**	**maxilla**	
19 (55.88%)	**5** (14.71%)	**14** (41.18%)	**central**
11 (32.35%)	**3** (8.82%)	**8** (23.53)%	**lateral**
4 (11.76%)	**1** (2.94%)	**3** (8.82%)	**canine**
34 (100%)	**9** (26.47%)	**25** (73.53%)	**total**

Table 4.Success Rate of Immediately Placed Anterior Single Implants .

Success Rate%	**No of failures**	**No of implant**	**Time interval month**
34 (100%)	**0** (0%)	**34** (100%)	1-6
22 (100%)	**0** (0%)	**22** (64.75%)	7-12
11 (100%)	**0** (0%)	**11** (32.35%)	13-18