Annals of Medical Research

DOI: 10.5455/annalsmedres.2019.08.507 2019;26(12):2937-40

Original Article

Evaluation of early clinical features and outcomes after dental implant placement

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Abstract

Aim: It was aimed to evaluate implant success and outcomes in the first 3 months after implant placement.

Material and Methods: Totally, 75 patients with 123 dental implants that were placed different areas in the maxilla and mandible. Demographic and clinical data of the patients such as gender implant brand and duration of surgery was collected and analyzed during the first 3 months after implant placement.

Results: 45 (60%) females and 30 (40%) males, aged between 20 and 76 years were included. The mean age was 46.17±14.79 years. Dehiscence of the flap was in 22 patients after surgical procedure. In addition, one patient had implant failure and one patient had suppuration.

Conclusion: Within limitation of this study, implant success rate was high in early period. It was detected that insertion of dental implants was mostly located in the posterior region of the maxilla and mandible.

Keywords: Dental implant; early outcomes; success

INTRODUCTION

Dental implant contributes to regain of the chewing function and / or smile aesthetics in patients with complete or partial tooth deficiency. It is an alternative treatment instead of conventional fixed bridges or removable prosthesis. In addition, dental implants may offer fixed prosthesis in patients with total or partial edentulism or/and who cannot tolerate removable prostheses. Fixed prosthesis with dental implant also prevents the preparation of adjacent teeth (1-3).

Early and late outcomes of implant placement is crucial in the researches that evaluate the success of the dental implants. Early outcomes may be designated as a period up to the stage of prosthetic superstructure; the late outcomes can be defined as the process after the completion of the prosthetic superstructure. Thus, it will be easier to evaluate the implant surgery and identify the causes of implant failures. In the early period, many parameters affect the success of the implant surgery such as gender, brand of the implant, quality and quantity of the bone, type of surgical intervention, systemic condition of the patient, health of periodontal tissues, causes of tooth loss, duration of surgery and the experience of the practitioner (4-7).

The properties of the prosthetic superstructure, oral hygiene, health of periodontal tissues, the amount of resorption after implantation of the implant, the length and diameter of the implant are predictive factors for success of the dental implants and prosthesis in the late period (5,7). In this study, we aimed to evaluate implant success and outcomes in the first 3 months after implant placement without prosthetic superstructure.

MATERIAL and METHODS

Patients who underwent placement of endosteal implants between January 2015 and December 2016 in Istanbul Aydın University, Faculty of Dentistry were included in our clinical trial. This retrospective study was approved by İstanbul Aydın University, Ethics Committee. Early outcomes, demographic data and success of dental implants were evaluated which placed by Periodontologist

Received: 31.08.2019 **Accepted:** 29.10.2019 **Available online:** 09.01.2019
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and Oral and Maxillofacial Surgeon. The patients were excluded from our study which had following conditions: i) İmmunosuppressed, ii) Risk of infective endocarditis, iii) History of chemotherapy or/and radiotherapy, iv) Presence of acute or chronic infection in the oral cavity, v) Age under 20 years-old, vi) Systemic disease that may cause healing problems, vii) Pregnant and viii) Patients who needed over 3 endosteal implants.

In total, 123 implants were placed in 75 patients under local anesthesia. Five different implant brands which were MIS (MIS Implant Technologies, Shlomi, Israel), ITI (Straumann, Basel, Switzerland), Implance (Implance, Trabzon, Turkey), Biohorizons (Biohorizons Ltd, Birmingham, USA) and BTK (Biotec BTK, Vicenza, Italy), were included (Table 1). After implantation, the patients were controlled and collected data at the 2nd day, 1st week, 2nd week and 3rd month. The recorded data was as follows;

- Gender
- Implant brand
- The implant location
- The reason of loss tooth
- Surgical approach
- Duration of surgery
- Presence of vertical incision and suture
- Presence of pre-operative bone augmentation

Some surgical techniques were used during implant placement. These were standard (after healing of extraction socket and soft tissue after 6 months later), immediate (extraction of teeth and placement of the implant at the same time), immediate loading with fixed prosthesis, guided bone regeneration (GBR) and internal sinus lifting (Table 2).

RESULTS

A total of 75 patients, 45 (60%) females and 30 (40%) males, aged between 20 and 76 years were included in this study (Figure1). The mean age was 46.17±14.79 years. One to 3 implants were applied to each patient. The duration of surgery ranged from 5 minutes to 120 minutes, with a mean of 28.84 ± 20.90 and a median of 29 minutes. The distribution of implants was as followed: 53.3% MIS, 20% ITI, 12% Implance, 10.7% Biohorizons and 4% BTK. In our study, 17 implants were applied to 15 patients (18-30 years), 22 implants to 15 patients (31-40 years), 16 implants to 10 patients (41-50 years) and 68 implants to 35 patients (51 years and older), (Table 1, 3, 4).

Forty-percent and 30.7% of the patients had endosteal implants respectively in the posterior mandible and posterior maxilla. While 9.3% of the patients had implants in the anterior maxilla, 8% of the patients had implants in the anterior mandible. Implants were placed in the both posterior mandible and maxilla of the 9.3% patients. One patient (1.3%) had implants both in the anterior and posterior region of the upper jaw and another patient (1.3%) had implants in both the anterior and posterior region of the lower jaw (Table 5). Standard surgical approach was applied to the 62.7% of the patients and the other techniques located in Table 2. Bone augmentation was performed in 6.7% and 3.0 suture silk was used in 96% of the patients. In the first 3 months of follow-up, dehiscence of the flap was in 22 patients after surgical procedure. In addition, one patient had implant failure and one patient had suppuration (Table 4).

Table 1. Brand of dental implant

Brand of dental implant	Patients (n)	Percentage (%)
MIS	40	53,3
ITI	15	20,0
Implance	9	12,0
Biohorizons	8	10,7
BTK	3	4,0
Total	227	100.0

Table 2. Surgical techniques

Surgical approach	Patients (n)	Percentage (%)
Standard	47	62,7
Immediate	5	6,7
Internal sinus lifting	4	5,3
GBR	3	4,0
Standard and immediate	6	8,0
Standart and GBR	1	1,3
Immediate insertion and loading	8	10,7
Immediate and internal sinus lifting	1	1,3

Table 3. Distribution of age range, number of patients and implants

Age (n)	Number of implants	Number of patients
18- 30 years	17	15 (%20)
31- 40 years	22	15 (%20)
41-50 years	16	10 (% 13)
51 years and older	68	35 (%47)

Table 4. Clinical outcome and biological complications

Clinical outcome and complicatios	Number of patients
Flap dehiscence	22
Implant failure	1
Suppuration	1
Vertical insicion	11
Bone augmentation before surgical intervention	5
No suturation	3

Table 5. Location of inserted implants in the maxilla and mandible

Location of implant insertion	Patients (n)	Percentage (%)
Maxilla anterior	7	9,3
Maxilla posterior	23	30,7
Mandible anterior	6	8,0
Mandible posterior	30	40,0
Maxilla anterior and posterior	1	1,3
Maxilla posterior and mandible posterior	7	9,3
Mandible anterior and posterior	1	1,3

Table 6. Reasons of tooth loss

Reasons for tooth loss	Patients (n)	Percentage (%)
Periodontal	6	8,0
Caries	60	80,0
Trauma	6	8,0
Malposition	1	1,3
Impacted	1	1,3
Periodontal and caries	1	1,3

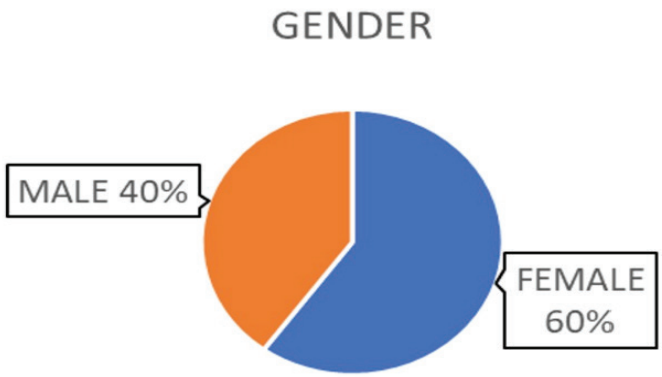

Figure 1. Distribution of gender

DISCUSSION

When similar retrospective studies were examined in the literature, the age range of study of Urvasızoğlu et al. was 46-55 years and the mean age was 41.1 years (8). In the studies of Eltaş et al. (9) and Vehemente et al. (10), age ranges and mean ages were 20-78; 45.2 years and 16-92; 53.5 years respectively. In our study, dental implants were applied to 75 patients aged 20 to 76 years under local anesthesia. In total, 68 of 123 implants were applied to 51years and older. While the number of implants applied to other age groups were close to each other, the highest number of implants were applied to the 51years and older. In our study and other researches, the average age was found 40 years and older. In addition, the causes of dental loss of patients were recorded in our study before surgical intervention. Eltas et al. (9) reported that 63.2% of the patients lost their teeth due to caries and endodontic problems and periodontal problems (35.4%) was another crucial reason (9). In present study, sixty (80%) patients lost their teeth because of tooth decay and the remaining (20%) lost their teeth due to trauma, periodontal diseases, malposition and impaction. One of the limitations of our study was the lack of evaluation of the relationships between reasons of the tooth loss and implant success (Table 3,6).

In the literature, the location where the implants were applied to the jaws are generally detected in the posterior maxilla and mandibula. In the study of Urvasızoğlu et al. (8), 40% of the implants were applied to the anterior region and 60% to the posterior region. Likewise, Vehemente et al. (10) also found that more implants were applied in the posterior. In our retrospective study, 60 patients were applied to posterior region of maxilla and/or mandible. The number of patients implanted only in the anterior region of the maxilla and mandible was 13. The results obtained from all these studies show that the loss of teeth in the maxilla and mandible posterior region is higher than the anterior region (Table 5).

One of the most critical point in clinical studies is the type of surgical approach. Surgical techniques also have a direct impact on the success of implants. Surgical techniques generally include standard, immediate and/or immediate loading, bone augmentation techniques and implant placement. In our clinical trial, the number of patients implanted with the standard approach was 47. While the number of patients who were inserted and loaded immediately was 8, the number of patients who applied both standard and immediate techniques was 6. The duration of surgery ranged from 5 to 120 minutes with an average of 28.84±20.90 minutes. The number of patients who previously underwent bone augmentation was 5. Vertical incision was performed in 11 of the patients who had mucoperiosteal flap removal during surgery and three patients did not use any suture material. Twenty-two patients had flap dehiscence after the procedure, one patient had suppuration and one patient had implant failure. The success rate of the implant in the first 3 months after implant placement was 98.37%. Standard technique is one of the most commonly used methods in the clinics. The biological results of the applied techniques and the evaluation of the success rates together are very important in terms of demonstrating the success of surgical techniques. The evaluation of the success of the immediate technique and / or loading and augmentation methods in the future may make a significant contribution to the literature. Limitations of our study were limited patients, no analyze of the diameter and length of the endosteal implants, no follow-up after prosthetic superstructure (Table 2, 4).

CONCLUSION

Although flap dehiscence was mostly observed clinical outcome, success rate of the dental implant surgery is

satisfying during first three months. Within the limitation of the study, the main reason of tooth loss was caries (80%) and most of the patients were 51 years and older (47%). Placement of the dental implants was predominantly posterior maxilla and mandible.

Competing interests: Written informed consent was obtained from each patient included in the study.
Financial Disclosure: There are no financial supports.
Ethical approval: This retrospective study was approved by Istanbul Aydın University, Ethics Committee.

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REFERENCES

1. Buser D, Chappuis V, Belser UC, et al. Implant placement post extraction in esthetic single tooth sites: when immediate, when early, when late? Periodontology 2000 2017;73:84-102.
2. Bornstein MM, Halbritter S, Harnisch H, et al. A retrospective analysis of patients referred for implant placement to a specialty clinic regarding indications, surgical procedures and early failures. Int J Oral Maxillofac Implants 2008;23:1109–16.
3. Brugger OE, Bornstein MM, Kuchler U, et al. Implant therapy in a surgical specialty clinic: an analysis of patients, indications, surgical procedures, risk factors, and early failures. Int J Oral Maxillofac Implants 2015;30:151–60.
4. Moraschini V, Poubel LAC, Ferreira VF, et al. Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review. Int J Oral Maxillofac Surg 2015;44.3:377-88.
5. Simonis P, Dufour T, Tenenbaum H. Long-term implant survival and success: a 10-16 year follow-up of non-submerged dental implants. Clin Oral Implants Res 2010;21:772-7.
6. Misch CE, Perel ML, Wang HL, et al. Implant success, survival and failure: the International Congress of Oral Implantologists (ICOI) Pisa consensus conference. Implant Dent 2008;17:5-15.
7. Jemt T. Single implants in the anterior maxilla after 15 years of follow-up: comparison with central implants in the edentulous maxilla. Int J Prosthodont 2008;21:400-8.
8. Urvasızoğlu GG, Saruhan N, Ataol M. Dental İmplant Uygulamalarının Demografik ve Klinik Özelliklerinin Değerlendirilmesi. Atatürk Üniv Diş Hek Fak Derg 2016;26:394-8.
9. Eltaş A, Dündar S, Uzun IH, et al. Assesement of dental implant success and patient profile. Atatürk Üniv Diş Hek Fak Derg 2013;1:1-8.
10. Vehemente VA , Chuang SK, Daher S, et al. Risk factors affecting dental implant survival. J Oral Implantol 2002;28:74-81.