

Dental Implants - Success Vs Failure Rate

Introduction

Implant therapy, today is a widely accepted treatment modality in dental medicine. It was introduced into the dental field since the early 1970s. Although, there are many advances in techniques, materials, and implant design, the potential for clinical failure is a major concern. An implant is considered to be failed when there is loss of osseointegration. Following history taking and thorough clinical examination, radiographic investigation is performed using digital periapical x-rays in cases of single missing tooth and Orthopantograph if more than two missing teeth (Cone beam computed tomography (CBCT) is not available). The protocol of implant placement is as follow: Patient is instructed to rinse with chlorhexidine 0.12%. Appropriate Local anesthesia is administered. Full thickness flap is elevated. Osteotomy is prepared using drills with sterile saline irrigation. PA x-ray is taken to ensure proper implant position and angulation. Osseotite 3i Biomet cylindrical implant is inserted. Suturing is usually done with resorbable suture. Postoperative medications, Augmentin, Ibuprofen and chlorhexidine mouthwash.

Materials and Methods

A total of 165 patients received treatment in a governmental hospital in the Eastern Province (Qatif Central Hospital) from Muharam till Dhul-Hijja in the year 1436H. From 25 October

2014 to 13 October 2015. 165 patients received a total of 223 endosseous Biomet 3i implants which were placed; 50 implants in the anterior region and 173 implants in the posterior region. 26 of these patients had bone graft placed at the site of the implant; FRIOS Algipore Biol. Apatite (Dentsply) was used. All the data was collected from patient records. In this study, early failure cases are recorded that is before functional loading plus all implants are placed by one certified implantologist with one year experience, all implants were placed in healed socket sites.

Results (Table 1-3)

Table 1: Gender configuration.

Female	Male	Total
119	46	165
72.1%	27.9%	

Table 2: Sites of implant placement.

	#11	#12	#13	#14	#15	#16	#17	Total	Failure percentage
Right Maxillary Arch									
No. of implants	16	10	5	23	17	9	1	81	
No. of implants failed	3	2	1	2	0	0	0	8	9.9%
Left Maxillary Arch	#21	#22	#23	#24	#25	#26	#27		
No. of implants	11	4	6	14	13	17	0	65	
No. of implants failed	1	1	1	0	1	0	0	4	6.2%
Left Mandibular Arch	#31	#32	#33	#34	#35	#36	#37		
No. of implants	0	0	0	3	5	21	1	30	
No. of implants failed	0	0	0	0	0	0	0	0	0%
Right Mandibular Arch	#41	#42	#43	#44	#45	#46	#47		
No. of implants	1	1	1	4	9	30	1	47	
No. of implants failed	0	0	0	0	1	1	0	2	4.3%
Failure Percentage	14.3%	20%	16.7%	4.5%	4.5%	1.3%	0%		
Total Failure Percentage	Anterior-20%			Posterior-2.3%					22.3%

Percentage of failure in the maxillary arch is 8.2%

percentage of failure in the mandibular arch is 2.6%

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Case Report

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Table 3: Sizes of implants used.

Size	3.25*10	3.25*11.5	3.25*13	4*8.5	4*10	4*11.5	4*13	5*8.5	5*10	Total
No. of implants used	12	18	4	12	37	73	9	21	37	223
No. of ailed implants	3	3	0	1	3	4	0	0	0	14
Failure percentage	25%	16.7%	0%	8.3%	8%	5.5%	0%	0%	0%	6.2%

Only 3 cases from 26 that had bone graft placement had failed gives a range of 11.5%.

Discussion

The main predictors of implant success are quantity and quality of bone, patient's age, the location and length of the implant, oral hygiene condition and dentist's experience. Misch [1] suggested raising the rate for implant success rate in 5-years from 75% (the criterion established in 1978) to 90% with a success rate of 85% for 10-years. There are some factors that are not discussed in this study; trauma, gingival condition, smoking and parafunctional habits. All patients were medically controlled at the time of implant placement.

The majority of patients treated were female patients 72.1% for that a comparison is not possible between the failure rates of males and females.

The percentage of failure in the maxillary arch is 8.2% which is higher than the findings of Lazzara et al. [2] which showed a failure rate of 6.2% of threaded 3i implants and 4.5% in cylindrical 3i implants. While, in the mandible the failure percentage is 2.6% which is quite similar to the findings of Lazzara et al. [2] which showed a 3% failure rate of 3i threaded implants and a 4% failure rate of 3i cylindrical implants.

The total rate of early failure is 22.3%. On the contrary of Davarpanah et al. [3] which showed a very high success rate when 3i implants were used. This study had a total of 55 failures; 47 early failures of 1,583 3i implants used (3% early failure rate) and 8 late failures (0.5%) in a 5-year data follow up.

Most failed implants were the size 3.25(w)*10(l) a rate of 25% followed by the size 3.25(w)*11.5(l) with a rate of 16.7%. Usually these sizes were used in a narrow arch. Recent publications showed that implant diameter had no relationship with the survival rate on the other hand there is an increased

failure rate with short implants which was associated with the operators' learning curve, Renouard et al. [4]. Implants replacing the maxillary lateral incisor had the highest failure rate of 20% followed by implants replacing the maxillary canine 16.7%. This could be explained by the anatomy of the lateral incisor being small in width so the socket site would be narrow and have thin bone.

The overall early failure was 10 (20%) implants in the anterior region and 4 (2.3%) implants in the posterior region. This could be explained by insufficient clinical judgment in the anterior region due to lack of CBCT.

Conclusion

Setting of thresholds for success criteria is crucial to the reporting of success rates. Case specific selection criteria plus detailed clinical and radiographic investigation is highly recommended to ensure the early success of implants.

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