

Original Research

Comprehensive Assessment of Successes of Dental Implant Therapy With and Without Platform Switching: An Original Research Study

¹Tarannum Alam Shaikh, ²Sonawane Arati Kishor, ³Ritu Yadav, ⁴Nirgude Akshata Audhoot, ⁵Minal Bhende, ⁶Praneti Shah

¹Post Graduate Resident III Year, ²⁻⁶Post Graduate Resident II Year, Department of Prosthodontics and Crown & Bridge, National Institute of Medical Science Dental College & Hospital, Jaipur, India

ABSTRACT:

Background & Aim: Dental implant therapy is very common in dental practice these days. However failures do occur in various aspects and ways. So, overall success is highly dependable on several factors. This study was planned to assess the relative successes of dental implant therapy with and without platform switching ideology. **Materials and Methods:** In this study, total 20 patients were selected in which single tooth rehabilitation was needed. Only mandibular molar region was selected for implant placement. Group 1 has 10 patients wherein single osseointegrated implants were placed with platform switching concept. Group 2 has 10 patients wherein single osseointegrated implants were placed without platform switching concept. Implant success were recorded and noted in post operative phases. All rights and privacy of patients was kept confidential. Data was sent for statistical analysis using SPSS software. P value less than 0.05 was taken as significant. **Statistical Analysis & Results:** Results showed that out of total 20 subjects 13 male and 7 females were in the age range of 30 to 45 years. In 30-33 years, total 3 patients were there. P value was highly significant for this group (0.01). In group 1, total 9 patients were shown to have successful implant therapy. P value was highly significant for this group (0.01). In group 2, total 7 patients were shown to have successful implant therapy. ANOVA assessments done between groups revealed highly significant p value (0.001). **Conclusion:** Authors concluded that platform switching clearly rises implant success by reducing bone loss. Implants placed without platform switching concept showed higher failure rate. Authors also expect other significant studies to establish other important guidelines in these perspectives.

Keywords: Platform Switching, Bone Loss, Implant, Success, Surgery, Osseointegration

Received: 12 April 2023

Revised: 29 April 2023

Accepted: 15 May 2023

Corresponding author: Ritu Yadav, Post Graduate Resident II Year, Department of Prosthodontics and Crown & Bridge, National Institute of Medical Science Dental College & Hospital, Jaipur, India

This article may be cited as: Shaikh TA, Kishor SA, Yadav R, Audhoot NA, Bhende M, Shah P. Comprehensive Assessment of Successes of Dental Implant Therapy With and Without Platform Switching: An Original Research Study. J Adv Med Dent Res 2023;11(5):112-115.

INTRODUCTION

Dental implants are highly prone to be attacked by surrounding infections and bacterial activities. Any potent invasion of infection in implant milieu can result in infection and inflammation of the peri-implant tissues.^{1,2,3} This is frequently referred as peri-implantitis. Researchers are experimenting and trying to find out the possible solution for the same. Peri-implant bone or crestal bone is the first hard tissue which is resorbing with inflammatory process.^{4,5,6} This crestal bone is the primary supporting apparatus which provides primary stability to the newly installed implants. Therefore due care must be given to this bone. Platform Switching is one of the popular concepts which have been shown to reduce the bone

loss around the dental implants.^{7,8,9} Many researchers have shown clinically and proven this concept in their long term studies.¹⁰⁻¹⁴ Platform Switching is a technique in which an abutment that is one size smaller than the implant platform is placed in order to minimize the bone loss around the implant. This study was planned to assess the relative successes of dental implant therapy with and without platform switching ideology.

MATERIALS AND METHODS

The study was planned and performed to logically evaluate the implant success and related parameters with and without platform switching ideology. Total 20 patients were selected from the regular OPD of

patients in which single tooth rehabilitation was needed. Patients were convinced for implant therapy and related advantages. Both male and female patients were included in the study without any gender bias. Systemic sampling procedure was employed for precise sampling/selection of subjects. Single tooth replacement was commenced with implant placement. Only mandibular molar region was selected for implant placement. Moreover, patients with any habit of smoking, para-function, bruxism and underlying systemic disease were immediately excluded from the study. This was carefully done since all these situations can interfere with the data quality and hence results. Patients with any kind of follow up problems were also excluded from the study. The study objectives and purpose was explained in detail to all participating patients and informed consent was obtained accordingly. Two study groups were made to evaluate relative successes of dental implant therapy with and without platform switching ideology. Group 1 has 10 patients wherein single osseointegrated implants were placed with platform switching concept. Group 2 has 10 patients wherein single osseointegrated implants were placed without platform switching concept. Implant success were recorded and noted in post operative phases. Different implant success criteria were used to categorize cases as success or failure. All rights and privacy of patients was kept confidential. Data was sent for statistical analysis using SPSS software. P value less than 0.05 was taken as significant.

STATISTICAL ANALYSIS AND RESULTS

All relevant data was accumulated and entered into master excel sheet for processing by SPSS software. Appropriate tests were then used to check significant inferences. Table 1 & Graph 1 show about age & gender based distribution of all participating subjects. Total 20 subjects were studied with 13 male and 7 females in the age range of 30 to 45 years. In 30-33 years, total 3 patients were there. P value was highly significant for this group (0.01). In the next age range of 34-37 years, total 7 patients were present. P value was not significant for this group (0.20). Similarly, in age group of 42-45 years, total 5 patients were found. P value was not significant for this group. Table 2 shows about basic statistical analysis and descriptions for complication related successes of Group 1 with platform switching & Group 2 without platform switching concept. In group 1, total 9 patients were shown to have successful implant therapy. P value was highly significant for this group (0.01). In group 1, only 1 patient was presented with failed implant therapy. In group 2, total 7 patients were shown to have successful implant therapy. P value was not significant for this group (0.28). In group 2, total 3 patients were presented with failed implant therapy. P value was not significant for this group (0.80). Table 3 showed about assessment amongst the 2 study groups using one-way ANOVA [for Group 1 & 2]. Assessments done between groups revealed highly significant p value (0.001). Assessments done within groups revealed no p value.

Table 1: Age & gender based statistical details of participating patients

Age Group (Yrs)	Male	Female	Total	P value
30-33	2	1	3	0.01*
34-37	4	3	7	0.20
38-41	4	1	5	0.10
42-45	3	2	5	0.90
Total	13	7	20	*Significant

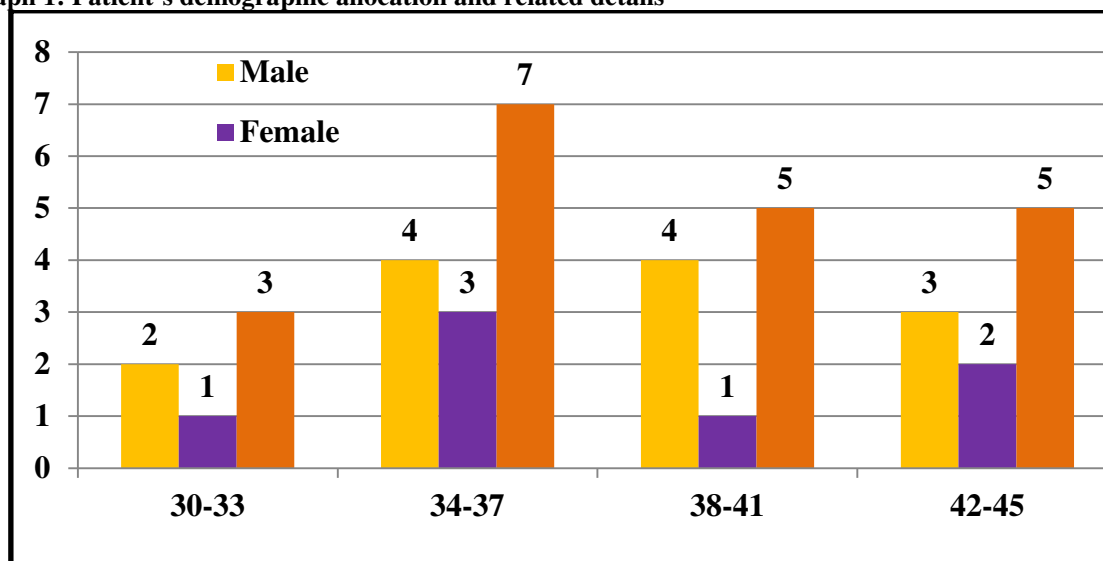
***p<0.05 significant**

Table 2: Basic statistical analysis and descriptions for complication related successes of Group 1 with platform switching & Group 2 without platform switching concept

Group	Status	n	Stat. Mean	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	p value
Group 1	Success	9	2.83	0.129	0.125	1.32	1.231	2.0	0.01*
	Failed	1	1.12	0.951	0.558	1.12	1.893	2.0	0.30
Group 2	Success	7	2.32	0.233	0.232	1.84	1.432	1.0	0.28
	Failed	3	1.21	0.642	0.049	1.23	1.343	1.0	0.80

Table 3: Assessment amongst the 2 study groups using one-way ANOVA [for Group 1 & 2]

Variables	Degree of Freedom	Sum of Squares Σ	Mean Sum of Squares mΣ	F	Level of Significance (p)
Between Groups	2	2.043	1.237	1.1	0.001*
Within Groups	18	4.923	0.124		-
Cumulative	132.20	9.325			*p<0.05 significant

Graph 1: Patient's demographic allocation and related details

DISCUSSION

Canullo and associates studied about short-term bone level observations associated with platform switching in immediately placed and restored single maxillary implants.¹⁵ They showed that platform switching is highly important in reducing bone loss. This was in accordance with our study's inferences. Calvo-Guirado and others have studied about immediate maxillary restoration of single-tooth implants using platform switching for crestal bone preservation.¹⁶ They also confirmed that platform switching is extremely important in reducing crestal bone loss. Prosper and others did a randomized prospective multicenter trial evaluating the platform-switching technique for the prevention of postrestorative crestal bone loss.¹⁷ This was in accordance with our study's inferences. They demonstrated that platform switching is working only in selected cases and situations. Rodríguez-Ciurana and associates estimated effect of interimplant distance on the height of the inter-implant bone crest when using platform-switched implants.¹⁸ They also favored the concept of platform-switching technique in reducing bone loss around the implants. This was in accordance with our study's inferences. Calvo Guirado studied immediate loading and immediate restoration in 105 expanded-platform implants via the system after a 16-month follow-up period.¹⁹ They showed the mechanism of action and microbiology of platform switching. This was in accordance with our study's inferences. Cappiello and colleagues have studied about evaluation of peri-implant bone loss around platform-switched implants.²⁰ They also agreed about reduction of bone loss in platform switching. This was in accordance with our study's inferences.

CONCLUSION

Inferences of this study were highly significant and remarkable. Authors concluded that there was a clear rise in implant success rate when placed with platform

switching concept. The results were significant also. Implants placed without platform switching concept showed higher failure rate. However, platform switching concept must be utilized carefully only in applicable situations only. Authors also expect other significant studies to establish other important guidelines in these perspectives.

REFERENCES

- Gupta S, Sabharwal R, Nazeer J, Taneja L, Choudhury BK, Sahu S. Platform switching technique and crestal bone loss around the dental implants: A systematic review. *Ann Afr Med.* 2019 Jan-Mar;18(1):1-6.
- Tarnow DP, Magner AW, Fletcher P. The effect of the distance from the contact point to the crest of bone on the presence or absence of the interproximal dental papilla. *J Periodontol.* 1992;63:995-6.
- Albrektsson T, Zarb G, Worthington P, Eriksson AR. The long-term efficacy of currently used dental implants: A review and proposed criteria for success. *Int J Oral Maxillofac Implants.* 1986;1:11e25.
- Zarb GA, Albrektsson T. Consensus report: Towards optimized treatment outcomes for dental implants. *J Prosthet Dent.* 1998;80:641.
- Gardner DM. Platform switching as a means to achieving implant esthetics. *N Y State Dent J.* 2005;71:34-7.
- Lazzara RJ, Porter SS. Platform switching: A new concept in implant dentistry for controlling postrestorative crestal bone levels. *Int J Periodontics Restorative Dent.* 2006;26:9-17.
- Hermann F, Lerner H, Palti A. Factors influencing the preservation of the periimplant marginal bone. *Implant Dent.* 2007;16:165-75.
- Degidi M, Iezzi G, Scarano A, Piattelli A. Immediately loaded titanium implant with a tissue-stabilizing/maintaining design ('beyond platform switch') retrieved from man after 4 weeks: A histological and histomorphometrical evaluation. A case report. *Clin Oral Implants Res.* 2008;19:276-82.
- Landolt M, Blatz M. The concept of platform switching. *Pract Proced Aesthet Dent.* 2008;20:55.

10. Chang J. Platform switching. *J Mass Dent Soc.* 2008;57:40.
11. Romanos GE, Nentwig GH. Immediate loading using cross-arch fixed restorations in heavy smokers: Nine consecutive case reports for edentulous arches. *Int J Oral Maxillofac Implants.* 2008;23:513–9.
12. Simonpieri A, Del Corso M, Sammartino G, Dohan Ehrenfest DM. The relevance of Choukroun's platelet-rich fibrin and metronidazole during complex maxillary rehabilitations using bone allograft. Part II: Implant surgery, prosthodontics, and survival. *Implant Dent.* 2009;18:220–9.
13. Ericsson I, Persson LG, Berglundh T, Marinello CP, Lindhe J, Klinge B, et al. Different types of inflammatory reactions in peri-implant soft tissues. *J Clin Periodontol.* 1995;22:255–61.
14. Hagiwara Y. Does platform switching really prevent crestal bone loss around implants? *Jpn Dent Sci Rev.* 2010;46:122–31.
15. Canullo L, Goglia G, Iurlaro G, Iannello G. Short-term bone level observations associated with platform switching in immediately placed and restored single maxillary implants: A preliminary report. *Int J Prosthodont.* 2009;22:277–82.
16. Calvo-Guirado JL, Ortiz-Ruiz AJ, López-Marí L, Delgado-Ruiz R, Maté-Sánchez J, Bravo Gonzalez LA, et al. Immediate maxillary restoration of single-tooth implants using platform switching for crestal bone preservation: A 12-month study. *Int J Oral Maxillofac Implants.* 2009;24:275–81.
17. Prosper L, Redaelli S, Pasi M, Zarone F, Radaelli G, Gherlone EF, et al. A randomized prospective multicenter trial evaluating the platform-switching technique for the prevention of postrestorative crestal bone loss. *Int J Oral Maxillofac Implants.* 2009;24:299–308.
18. Rodríguez-Ciurana X, Vela-Nebot X, Segalà-Torres M, Calvo-Guirado JL, Cambra J, Méndez-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;29:141–51.
19. Calvo Guirado JL, Ortiz Ruiz AJ, Gómez Moreno G, López Marí L, Bravo González LA. Immediate loading and immediate restoration in 105 expanded-platform implants via the diem system after a 16-month follow-up period. *Med Oral Patol Oral Cir Bucal.* 2008;13:E576–81.
20. Cappiello M, Luongo R, Di Iorio D, Bugea C, Cocchetto R, Celletti R, et al. Evaluation of peri-implant bone loss around platform-switched implants. *Int J Periodontics Restorative Dent.* 2008;28:347–55.