



Assessment of survival rate of the dental implants after the treatment with the platelet- rich plasma

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ABSTRACT

Background: The survival rate of dental implants is generally high, with success rates ranging from 95% to 98% over a 10-year period. The present study was conducted to assess survival rate of the dental implants after the treatment with the platelet- rich plasma (PRP).

Materials & Methods: 54 patients who received dental implants of both genders were divided into 2 groups of 27 each. In group I, dental implants were inserted with PRP and in group II, dental implants were inserted without use of PRP. Success criteria of Buser et al and Albrektsson et al was recorded in both groups.

Results: Group I had 17 males and 11 females and group II had 12 males and 16 females. In group I and group II, survival rate was 93% and 90%, cumulative survival rate was 94% and 92%, success according to Buser was 95% and 93%, cumulative success according to Buser was 76% and 72%, success according to Albrektsson was 80% and 78% and cumulative success according to Albrektsson was 81% and 79% respectively. The difference was significant ($P < 0.05$).

Conclusion: Following sinus-lift surgery, dental implants put using autologous bone have comparable to other bone substitute materials in terms of excellent long-term survival and success rates. PRP doesn't seem to have any benefits and could potentially be harmful in minor negative effects on implant survival and other success indicators.

Key words: dental implants, success rates, platelet- rich plasma

INTRODUCTION

The survival rate of dental implants is generally high, with success rates ranging from 95% to 98% over a 10-year period. Dental implants are considered a reliable and long-lasting solution for replacing missing teeth.¹ However, it's important to note that the success of dental implant treatment can vary depending on several factors, including the patient's overall health, oral hygiene practices, the skill and experience of the dentist or oral surgeon performing the procedure, and the location of the implant in the mouth.²

Various studies have been conducted to determine the long-term success of dental implants. These studies often report implant survival rates after specific time intervals, such as one year, five years, or ten years. While success rates can vary slightly among studies, they generally indicate a high rate of success.³

A substantial amount of bone is needed in both the vertical and horizontal orientations for the primary implant stability and effective osseointegration. Implants must be at least 10 mm in length and 3 mm in diameter.⁴ They are necessary for prosthetic rehabilitation, thus thorough, individualised surgical and prosthetic planning before to implantation is desirable. However, atrophic jaw areas may still be a good candidate for an implant site.⁵ Before implanting, bone augmentation is necessary in certain circumstances. In order to improve the outcomes of bone augmentation surgery and minimise patient impairment, continual efforts are made to improve augmentation methods and effectiveness.⁶

Platelet-rich plasma (PRP) constitutes an autologous source of growth factors involved in the osteogenic and angiogenic procedures. Its use in sinus augmentation has been often supported even if today's debate about its effective usefulness is still open in the scientific community.⁷ The present study was conducted to assess survival rate of the dental implants after the treatment with the platelet- rich plasma (PRP).

MATERIALS & METHODS

The present 5 years retrospective study consisted of 54 patients who received dental implants of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 27 each. In group I, dental implants were inserted with PRP and in group II, dental implants were inserted without use of PRP. Success criteria of Buser et al⁸ and Albrektsson et al⁹ was recorded in both groups. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method	PRP	Without PRP
M:F	17:11	12:16

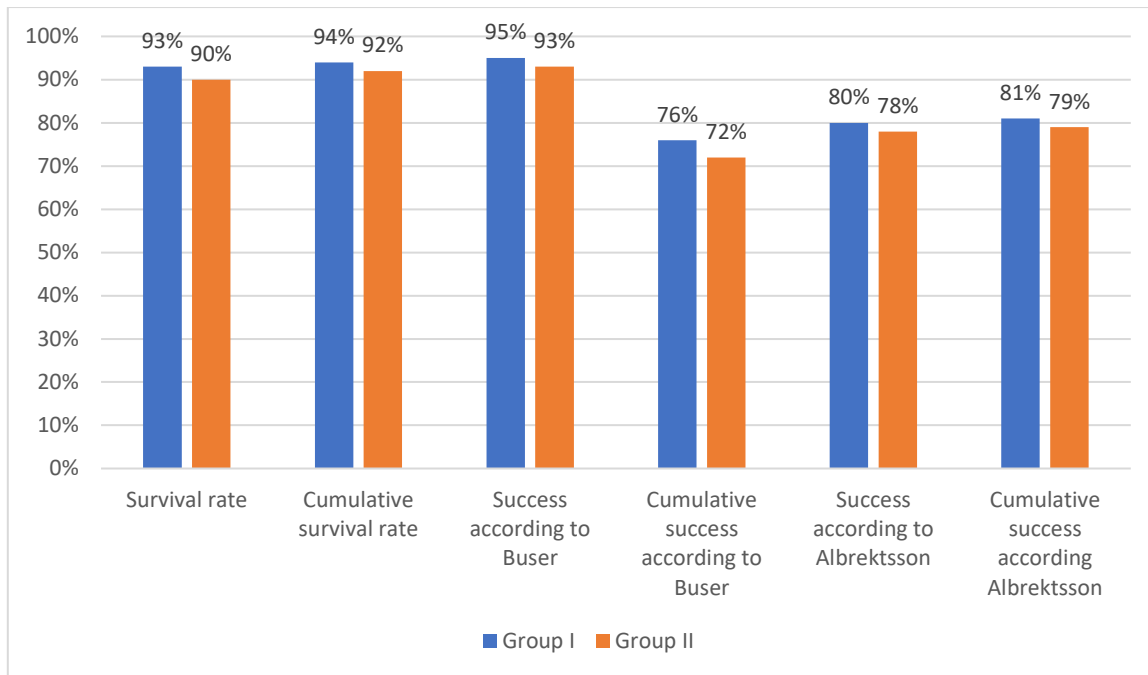
Table I shows that group I had 17 males and 11 females and group II had 12 males and 16 females.

Table II Comparison on survival rate

Parameters	Group I	Group II	P value
Survival rate	93%	90%	0.12
Cumulative survival rate	94%	92%	0.43
Success according to Buser	95%	93%	0.52
Cumulative success according to Buser	76%	72%	0.75
Success according to Albrektsson	80%	78%	0.92
Cumulative success according Albrektsson	81%	79%	0.65

Table II, graph I shows that in group I and group II, survival rate was 93% and 90%, cumulative survival rate was 94% and 92%, success according to Buser was 95% and 93%, cumulative success according to Buser was 76% and 72%, success according to Albrektsson was 80% and 78% and cumulative success according Albrektsson was 81% and 79% respectively. The difference was significant (P< 0.05).

Graph I Comparison on survival rate



DISCUSSION

Facial bone loss brought on by congenital defects, disease, ageing, or trauma can cause deficiencies in maxillary bone. Patients and healthcare professionals continue to struggle with it, depending on how severe it is. Patients who experience bone loss also experience severe psychological effects. Therefore, both cosmetic and functional healing are crucial in the maxillofacial region. Tissue engineering is being used more frequently in facial reconstruction to achieve excellent aesthetic and functional outcomes.^{10,11} In this situation, platelet-rich plasma (PRP) is also used to enhance autologous bone grafts. Recent years have seen a significant advancement in the use of tissue engineering and biomaterials, including decellularized matrix, nanoparticles, stem-cell therapies, scaffolds, and even the creation of a whole tooth.¹² The present study was conducted to assess survival rate of the dental implants after the treatment with the platelet- rich plasma (PRP).

We found that group I had 17 males and 11 females and group II had 12 males and 16 females. Thondati et al¹³ in their study dental implants and autologous bone grafts from the iliac crest were used to treat patients with maxillary atrophy. A split-mouth technique was used to treat 30 patients, with one side receiving additional PRP treatment while the other functioned as the control side. Twenty patients underwent one-sided therapy and were randomly assigned to the PRP or control group. Implants from the first study's patients were checked on an average of 5 years afterwards. The effectiveness of the implants was measured using two different success metrics. There were 30 patients investigated (20 women and 10 men). 15 patients (10 female, 5 male) were in the PRP group, while 15 patients (10 female, 5 male) were in the control group. In total, 240 implants were put into place. The PRP team received 100 implants as opposed to 100 implants for the control group. The survival rate was 95%, compared to 98% in the control group. After five years, there was no noticeable difference between the PRP group and the control group in terms of the cumulative likelihood of survival, which was 94% in the PRP group and 98% in the latter. When calculating the cumulative success probability using Albrektsson criteria, a greater significant difference was found for the control group.

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and cumulative success according Albrektsson was 81% and 79% respectively. Maiorana et al¹⁴ in their study, for a PRP-based maxillary sinus augmentation surgery, 28 patients were enlisted. Two patients were left out of the sample because they did not respond when called for the remote assessment. With 26 patients and 33 sinus augmentations overall, the study had an average follow-up of 65 months. In 26 treatments, a mixture of autologous bone from the oral cavity, deproteinized bovine bone Bio-Oss® in a ratio of 1:3, and PRP was utilised as the grafting material, and in seven procedures, a mixture of Bio-Oss and PRP was used. The implant survival rate recorded after a mean follow-up period of roughly 5 years was 95.9%. The limitation the study is small sample size.

CONCLUSION

Authors found that following sinus-lift surgery, dental implants put using autologous bone have comparable to other bone substitute materials in terms of excellent long-term survival and success rates. PRP doesn't seem to have any benefits and could potentially be harmful minor negative effects on implant survival and other success indicators.

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