
Evaluation of Aesthetic Outcome of Single Tooth Implant Borne Restoration

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ABSTRACT

Objective: To evaluate aesthetic outcome of single dental implants placed in anterior and premolar area of dental arches using the pink and white aesthetic scores.

Methods: Twenty-nine implants placed in the anterior and premolar region for single tooth replacement in 20 patients were evaluated. The patients were treated with single dental implants (6-8mm length bicon implant) that supported porcelain fused to metal crowns. Aesthetic outcome was evaluated a year after placement of dental implant, by assessing both clinical and photographed implant crowns with the contralateral teeth. The pink aesthetic score and white aesthetic score (PES & WES) were used to assess the aesthetic outcome.

Results: Twenty nine implants were placed in 20 patients (9 males and 11 females); six implants were immediate placements. A year after placement, all the implants had integrated with healthy peri-implant soft tissues according to standard clinical parameters. The mean score for pink aesthetics score was 8.9 ± 1.47 (range 6-12). Gingiva texture (1.76 ± 0.44) had highest mean score and the least mean score was for scar (1.10 ± 0.49). The mean for White aesthetic score was 7.76 ± 1.35 (range 5-10) with tooth volume having highest mean score as 2. and least mean score for characterization (1.03 ± 0.42). The mean total pink aesthetic score/white aesthetic score was 16.66 on a maximum of 22.

Conclusion: The objective assessment of aesthetic outcome using PES/WES index reveals that implant placement at aesthetic zone was successful. Guided tissue regeneration may be necessary to achieve a satisfactorily level of gingiva.

Key words: Aesthetic, Implant, Pink aesthetic score, White aesthetic score.

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INTRODUCTION

The use of endosseous dental implant in the maxillary anterior region is a well-known treatment option.¹ An important goal of implant placement is aesthetics and achieving it is a big challenge.¹ In recent years, there has been emphasis on achieving maximum aesthetics especially in dental implant placed in the aesthetic zone. Achieving maximal aesthetics is a challenge for the dentist because many factors determine the achievement of optimal aesthetic result.² These factors are either tooth-related such as tooth dimension, form, colour and tissue-related such as interdental and midfacial soft tissue dimensions.^{3,4,5} Due to the high visibility of anterior maxilla region, the restoration of missing tooth with implant in this zone present anatomical challenge especially when there is insufficient

available bone volume and thin soft tissue.⁶

There are previous reports on factors affecting aesthetics ranging from hard and soft tissue management to macro and micro design of implants.⁷⁻¹⁰ In the assessment of aesthetic outcome, implant scoring index which put into consideration both the tooth, the white index scoring (WES) and tissue factor, the Pink esthetic score (PES) were as proposed.¹² The Pink esthetic index evaluates the mesial papilla, distal papilla, curvature of the facial mucosa, level of facial mucosa, and soft tissue colour and texture.¹²

Since aesthetic is vital to the success of dental implant placement in aesthetic zone, it is therefore necessary to evaluate aesthetic outcome of the single dental implant placed in anterior and premolar area of dental arches.

MATERIALS AND METHODS

The study is a descriptive cross-sectional study, that was carried out among patient attending the dental implant clinic of the Lagos University Teaching Hospital, Lagos, Nigeria between May, 2016 and June, 2017. A total of twenty patients were recruited using the consecutive, convenience sampling method. The entire patients having single implant placement on the anterior region of single or both dental arch who gave informed

consent were included while those who did not give consent were excluded. Ethical approval was obtained from the Ethical Committee of Lagos University Teaching Hospital. Detailed information was given to all participants and informed consent was obtained from them.

Twenty-nine implants were placed in the anterior and premolar region in 20 patients. Patients were treated with single dental implants (6-8mm length Bicon implant) that supported porcelain fused to metal crowns; titanium abutments were used at each site. Prostheses were fabricated with an occlusal scheme that provided simultaneous contact in maximal intercuspation.

Clinical photographs were taken before and after placement of crowns. Patient were reviewed and aesthetic outcome was evaluated a year after placement of dental implant, assessment of both clinical and photographed implant crowns with the contralateral teeth was done by two Restorative dentist and the pink aesthetic score and white esthetic score were used to evaluate the aesthetic.¹² Assessment using the Pink scoring index was done as described by Belser et al.¹²

The parameters evaluated in the pink esthetic score index were the mesial and distal papillae, curvature of facial mucosa, level of facial mucosa, root convexity, soft tissue colour and scar.

The parameters evaluated in the white esthetic score index were crown volume, colour, surface texture, translucency and characterization.

Scoring for mesial and distal papillae were as follows:

Papillae absent = 0

Incomplete Papillae = 1

Complete papillae = 2

Other parameters were scored as follows:

Major discrepancy = 0

Minor discrepancy = 1

No discrepancy = 2

A maximum score of 12 was assigned to the Pink aesthetic index and a maximum score of 10 was assigned to white esthetic index. Statistical analysis was performed using IBM SPSS version 21.0. The mean and standard deviation of the PES and WES was determined. Correlation test was utilized to detect any significant correlations between the PES and WES scores. Statistical significance was set at $p \leq 0.05$.

RESULTS

Twenty nine implants were placed in 20 patients (9 males (45%) and 11 females (55%). Six implants (20.7%) were immediate placements and the remaining 23 implants (79.3%) were not. The mean of Pink Aesthetic Score were low for level of facial mucosa (1.24 ± 0.74) and scar (1.10 ± 0.49) and the mean total score was 8.9 ± 1.47 (Table 1).

Characterization of crown (1.03 ± 1.35) had the lowest mean for white aesthetic score and the total mean white aesthetic score for all participants was 7.76 ± 1.35 (Table 2).

Table 1: Pink aesthetic index score

Parameters	Mean	Standard deviation
Gingiva Papillae	1.62	0.56
Curvature of facial mucosa	1.66	0.55
Level of facial mucosa	1.24	0.74
Root convexity	1.52	0.51
Soft tissue colour	1.76	0.55
Scar	1.10	0.49
PES	8.9	1.47

Table 2: White aesthetic index score

Parameters	Mean	Standard deviation
Tooth volume	2	-
Colour	1.69	0.47
Surface texture	1.83	0.38
Translucency	1.24	0.58
Characterization	1.03	0.42
WES	7.76	1.35

DISCUSSION

In this study the level of facial mucosa and scar had the lowest mean score of all PES parameters. This was a contrast to the result in previous study⁶ that

had the highest mean for PES parameters as level of facial mucosa. The reason for the finding in this study might be due to the exaggerated tissue response in Negroes that predispose them to

more scaring. This is demonstrated in the low scoring for scar.⁶ In the previous study no mucosa recession was recorded. The reason for the finding in previous study⁶ was attributed to early loading of bone level implants with a platform-switching concept to encourage soft tissue modeling.⁶ Another study attributed surgical protocol and proximity to a tooth with optimal alveolar bone level and reduced facial mucosa.¹³ Guided tissue regeneration may be necessary to achieve a satisfactory level of gingiva. A high frequency of facial bone and mucosa level (above 90%) was reported in previous studies where immediate implant placement was made with guided tissue regeneration and bone augmentation.¹⁴

Improvement of level of facial mucosa and scar will help in sustaining aesthetic appearance and this contribute to the characteristic of soft tissue which is essential in consideration of aesthetics.¹⁵ The mean for curvature of facial mucosa was however higher than previous study,⁶ that reported most of it's participants having thin gingiva biotype. In this study, most participants had better gingival biotype and implant placed was Bicon compared with Strauman implant in previous study.⁶

The aesthetic outcome of single implant placement in esthetic zone, reported that PES (mean 7.8) were clearly higher than the corresponding WES (mean of 6.9).¹² The finding in this study is similar but varies with previous study.⁶ The reason for the finding was attributed to the use of a single technologist. In this study, a single technologist fabricated all restorations.

Characterization of crowns had lowest score. A study.¹⁶ done to compare WES of ceramic and porcelain fused with metal crowns, noted no significant difference between the two groups. In this study, porcelain fused with metal crowns was used as restoration. It suggest that attention should be placed on characterization of crown restoration in implant placement.¹⁶

CONCLUSION

The objective assessment of aesthetic outcome using PES/WES index reveals that implant placement at aesthetic zone was successful. Guided tissue regeneration is recommended for satisfactory gingival level of facial mucosa in enhancing aesthetics. Emphasis should also be placed on the characterization of crown restoration in implant placement to enhance aesthetic outcome.

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