

Soft tissue evaluation of an immediate esthetic zone single implant with a stereolithographic guide using 3D reconstruction and a CAD/CAM customized titanium anatomic abutment

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Appl. Sci. 2020, 10, 1678

Purpose

The purpose of this study was to evaluate the changes in the soft tissue following an immediate implant procedure using guided surgery in combination with a computer-aided design and computer-aided manufacturing (CAD/CAM) customized titanium anatomic abutment in the esthetic zone.

Materials & Methods

Study design : Retrospective clinical study

Subjects and Outcomes of the study

- Period : between April 2017 and May 2018(The mean follow-up period was 14.7 months, and the minimum follow-up period was one year)
- Patients : 13 patients who consisted of five males and eight females with a mean age of 49.6 years
- Implants : TS III 13 implants
- Outcome measures : The changes in the soft tissue dimension, interdental papilla, and esthetic score

Results

1) Soft Tissue Dimension

There was no statistically significant change in the midfacial mucosa (p-value: 0.028).The loss of the mesial papillary height was 0.32 ±0.83 mm (p-value 0.203), and of the distal papillary height, 0.10 ±0.060 mm (p-value: 0.594). The mean horizontal change in the midfacial soft tissue volume was 0.32 ±0.83 mm.

Table 1. The Change in the Soft Tissue Dimension

Parameters	Amounts of Change	p-Value
Midfacial mucosa level	0.27 ±0.42	0.028
Mesial papilla level	0.32 ±0.83	0.203
Distal papilla level	0.01 ±0.06	0.594
Horizontal change in the labial soft tissue Mean standard deviation	0.32 ±0.83	0.060

2) Jemt's Index

There was no significant difference in the mesial and distal papilla index between the measurements made prior to the extraction and at one year of follow-up, according to the Wilcoxon signed-rank test (p-value: 0.180, 0.157) (Table 2).

Table 2. The Jemt's Index.

Parameters	Amounts of Change	p-Value
Mesial papilla	-1.342*	0.180
Distal papilla	-1.414*	0.157

* : Z value.

3) PES

The mean and standard deviation of the PES and of each variable are depicted in Table 3. The overall score was 11.16 ±2.17 before treatment, and 10.25 ±1.42 after the follow-up period. There were two cases with a total score of 8 or less in both the pre-operative and follow-up periods, which can be regarded as esthetic failures.

Table 3. The Pink Esthetic Score.

PES Parameter	Pre-Operative	Follow-Up	p-Value
Mesial papilla	1.33 ±0.49	1.25 ±0.45	0.586
Distal papilla	1.42 ±0.51	1.58 ±0.51	0.438
Midfacial mucosa level	1.67 ±0.65	1.42 ±0.51	0.117
Midfacial contour	1.58 ±0.51	1.33 ±0.49	0.191
Alveolar process deficiency	1.33 ±0.78	1.16 ±0.72	0.504
Soft tissue color	1.58 ±0.51	1.42 ±0.51	0.339
Soft tissue texture	1.50 ±0.52	1.42 ±0.51	0.586
Total score	10.58 ±1.97	9.83 ±1.34	0.137

Conclusion

The immediate post-extraction placement of an implant in the esthetic zone should satisfy the esthetic and functional demands. The clinical case series in the present study provides clinicians with a scientific basis for an immediate placement procedure using a 3D reconstruction stereolithographic guide and restoration protocols with a CAD/CAM titanium anatomic abutment. This advanced technique provides an option with predictable outcomes for the replacement of teeth in the esthetic zone.