IMPLANT UTILIZATION AND TIME TO PROSTHETIC REHABILITATION IN ADVANCED FIBULAR JAW RECONSTRUCTION: A FOLLOW UP

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Purpose/Aim: Advanced three-dimensional digital surgical design and simulation (SDS) techniques is an emerging area of interest in the area of jaw reconstruction rehabilitation (JRR). Advanced digitally designed surgical techniques have the potential for early functional oral rehabilitation through improved patient treatment times for prosthetic rehabilitation.

In the previous study, the advanced three-dimensional digital surgical design and simulation group completed their prosthetic rehabilitation with significantly higher utilization of osseointegrated dental implants as well as a significantly shorter time to prosthetic delivery. The purpose of this follow-up study included a larger sample size and longer follow -up data to compare dental implant utilization and time to prosthetic connection between conventional and advanced JRR.

Materials and Methods: This follow-up study is a retrospective analysis of 35 adult head and neck tumor (HNT) participants treated at the Institute for Reconstructive Sciences in Medicine (iRSM). Participants completed JRR treatment with a fibular free flap reconstruction (FFF) and had undergone the following two treatment approaches: advanced three-dimensional (3D) SDS technique (with-SDS) and conventional/non-digitally planned (without-SDS) technique. Both treatment approaches included the use of osseointegrated dental implants. The current study continued data collected up to July 1, 2016. The same methods were applied to the follow-up study where participants were excluded participants if they underwent additional bone containing augmentation to the FFF. The conventional (without-SDS) group underwent a conventional, non-guided FFF reconstruction, and non-guided implant installation after the FFF. The advanced (with-SDS) group underwent a guided FFF reconstruction, and guided implant installation during the FFF surgery. The outcome measures implant utilization (ratio of implants installed to connected), time to prosthetic connection after FFF and patient demographics were analyzed using the Mann-Whitney U test.

Results: Thirty-five subjects (19 with-SDS, 16 without-SDS) fulfilled the inclusion criteria for the study. The time to prosthetic connection for the SDS group was statistically significant (p < 0.001) shorter number of day (422 days) compared to the without-SDS group (1391 days). The advanced three-dimensional (3D) SDS technique (with-SDS) group completed their prosthetic rehabilitation with a higher utilization of implants (94%) compared to the without SDS (78%), although this was not statistically significant.

Conclusions: The advanced three-dimensional digital surgical design and simulation group completed their prosthetic rehabilitation with significantly shorter time to prosthetic delivery. Although the implant utilization was not statistically significant in the follow-up study, both studies
yielded a higher ratio of implants utilized in the advanced three-dimensional digital SDS techniques (with-SDS group).