Periimplant soft tissue volume changes after connective tissue grafting. The autologous connective tissue graft vs. the porcine collagen matrix. A clinical follow-up case series

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Background: The thickness of peri-implant soft tissue is very important in the high risk esthetic area. Especially in advanced cases, i.e. high lip line, thin gingival biotype, loss of soft or hard tissues or bony atrophy, soft tissue grafting can be indicated in order to avoid gingival recession and periimplantitis. Gold standard is the autologous subepithelial connective tissue graft (SCTG) of the palate. To avoid tissue removal, porcine collagen matrices have been introduced as possible alternatives.

Aim/Hypothesis: This clinical study evaluates a porcine collagen matrix (CM) in comparison to the subepithelial connective tissue graft (SCTG) from the palate for soft tissue thickening around implants with a 3D follow-up.

Material and Methods: Patients (n = 12) were included after implant placement in the esthetic area with buccal tissue deficit. At the time point of implant exposure, buccal soft tissue were either thickened with the CM (n = 6) or the SCTG (n = 6). Impressions with a scan optimized vinylsiloxanether (Identium® Scan, Kettenbach GmbH, Eschenburg, Germany) were taken before augmentation (i), after surgery (ii), after 10 (iii), 30 (iv), 90 (v) and 180 days (vi). The impressions were optically scanned with a high precision scanner (Atos II Triple Scan, GOM GmbH, Braunschweig, Germany). The acquired data was visualized and superimposed with the ATOS Professional software (GOM GmbH, Braunschweig, Germany). The region of interest (ROI) was defined at the buccal area from the margin of the suprastructure to the mucogingival junction at the implant site and to the 2 adjacent teeth (primary outcome variable- volume increase in mm³ + secondary outcome variables- volume increase in%, mean and maximum thickness increases in mm).

Results: The evaluation of the region of interest at the different time points showed that there was a volume increase in both groups after surgery. After ten days, volume further increased in the SCTG group (183.88 mm³ = 139.03%) compared to the CM group (80.74 mm³ = 71.03%). This was a thickness increase (mm) of 2.31 mm in the SCT group and 1.12 mm in the CM group. Volume and thickness decreased in both groups over time (6 months- SCTG- 61.75 mm³ = 43.61%+ CM- 19.56 mm³ = 18.24%). This resulted in a thickness increase of 0.3 mm in the CM and 0.8 mm in the SCTG group with statistically significant difference after 6 months.

Conclusions and Clinical Implications: After 6 months, soft tissues thickness gain with the use of the porcine collagen matrix was significantly lower than with the use of the autologous subepithelial connective tissue graft. The SCTG still remains the gold standard for such procedures.