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Xenogeneic collagen matrix versus connective tissue graft for soft tissue augmentation at immediately placed implants. A prospective clinical trial

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Different placement and loading protocols have been developed in order to achieve faster and more efficient treatment times. Immediate implant placement (IIP) after tooth extraction allows the reduction of surgical procedures and the overall treatment time. Potential disadvantages include a higher risk of recession of the marginal mucosa, linked to the unavoidable shrinkage of the tissue volume, and a non-optimal positioning of the implant, which could affect the final esthetic result. Grafting procedures performed during immediate implant placement can improve both esthetic and functional outcomes of the treatment, reducing the risk of peri-implant mucosal recession, increasing the soft tissue thickness and decreasing the physiological tissues remodeling.

The primary outcome of the present study was the clinical and radiographical comparison between a xenogeneic collagen matrix (XCM) (Mucoderm) and the sub-epithelial connective tissue graft (SCTG) in combination with Type I implants, placed without provisionalization, at the 1-year follow up. The secondary aim of the study was the analysis of the patient-reported outcomes and the operative time.

Two surgical procedures were performed: Type 1 implant with SCTG (group 1) or with XCM (group 2). Peri-implant marginal bone loss (MBL) was assessed after one year using intraoral radiography. Plaque index (PI), probing depth (PD), bleeding on probing (BOP), width of keratinized tissue (KT) were assessed at baseline and one year after surgery. Marginal mucosal changes were assessed at baseline and at the one year follow up, measuring the distance between three points on the mucosal margin (mesial and distal papilla and the deepest point of the buccal mucosal margin) and the line connecting the buccal cusps of the adjacent teeth. Facial soft tissue thickness (FSTT) was recorded at baseline and after one year. The esthetic assessment was done with the pink esthetic score (PES) recorded one year after surgery. Patient-reported outcomes were evaluated after 7 days to assess pain and after 12 months with a VAS. Moreover, the time to perform the surgery was also recorded.

48 subjects were selected at the Catholic University of Rome. After one year no significant differences between the groups were observed for MBL. FSTT significantly increased in both groups from the baseline. No significant differences were noted between the groups for PI, BOP, PD as well as KT at one year post-surgery. Patients in Group 1 had a statistically significant lower mid buccal mucosal level than patients in Group 2; similarly, their FSTT was significantly higher. No significant differences were noted between the groups for the mucosal level on the mesial and distal papilla. Group 1 achieved a slightly better, but non statistically significant, esthetic result. Group 1 reported significantly higher VAS results than Group 2. The FSTT was significantly higher in Group 1 both in patients with a thick and a thin phenotype, the same result was not found for the MBML and the PES, where the SCTG had a better effect than the XCM only in patients with a thin phenotype.

The use of a xenogeneic collagen matrix for augmenting peri-implant soft tissues during immediate implant placement significantly augmented FSTT from the baseline, leading to optimal results in terms of esthetic and patients' satisfaction, even if inferiors for mid buccal mucosal level and FSTT when compared to the sub-epithelial connective tissue graft. The main advantages of the XCM over the SCTG were the reduced discomfort, perceived by the patients, and the operative time of the surgical procedure.

Key-words: Connective tissue graft; Xenogeneic collagen matrix; Immediate implants