Background and Aim

Soft tissue augmentation is often required to stabilize the soft tissue, to prevent and/or to treat soft tissue recessions and to meet expectations of a natural red-and-white esthetic appearance. Since autologous grafts involve several disadvantages such as the creation of a second surgical site with additional pain, morbidity and the limited availability of grafting material, the development of resorbable collagen scaffolds is continuously driven with the goal to offer an off-the-shelf alternative to autologous grafts.

The authors performed a first case series with a new regenerative collagen 3-D matrix containing vertically oriented open pores offering a potential alternative to autologous connective tissue grafts. The aim of this case series was to study the clinical performance of this innovative technology in indications that otherwise require the usage of autologous connective grafts.

Methods and Materials

A new 3-D regenerative collagen matrix was used in this case report (Muco-max, Matricel GmbH, Herzogenrath, Germany) that received CE-approval in October 2013. This biodegradable 3-D matrix is composed of porcine collagen and elastin fibres characterized by an open porous structure, that is intended to guide migrating cells and blood vessels into the matrix supporting the soft tissue regeneration.

The matrix is not chemically cross-linked and is expected to be remoulded completely during the healing process. For this series the product size 15 mm x 20 mm with a thickness of 3 mm was chosen.

The 3-D regenerative matrix was used for the treatment of the following clinical indications, according to the general clinical routines, in a total of 7 patients:

- Root coverage with coronally advanced flap (n=1) - this autologous technique is still the gold standard. The matrix was used as an alternative to autologous connective tissue grafts, especially in patients at high medical risk.
- Gap filled with anorganic bovine bone mineral (n=1) - to fill gaps between teeth and implant bodies.

The initial results obtained after clinical application of the new 3-D collagen matrix in closed healing procedures are very encouraging. All treatments with closed healing procedures were able to reach a satisfying outcome, both for the surgeon and the patient, without having to perform any connective tissue harvesting.

Further, however, well designed clinical studies involving larger patient populations are necessary to generate evidence-based data for validation of these first results, especially regarding the aspect of the gingival thickening.

Results

Operative handling, postoperative tissue reaction or infection and the clinical outcome were examined.

Root coverage procedure with coronally advanced flap was performed according to the general surgical guidelines using the matrix instead of a connective tissue graft. The surgical procedure was uneventful and the handling of the matrix was experienced as being user-friendly. The postoperative recall showed mild signs of gingival thickening around the gingival margin between the canine and the premolar, seem as an expected reaction to this type of surgical intervention. The outcome after 5 months showed successful recession coverage at the lateral incisor and the first premolar, but only a minor gain of coverage at the canine. Due to the traction of a remaining labial frenulum at the canine it was not possible to reach complete coverage. During a further surgical procedure, and by applying a semi lunar technique, the frenulum traction was removed and full root coverage was finally achieved.

Clinical Case for Immediate Implantation & Biotype Thickening

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Conclusions

However, further well designed clinical studies involving larger patient populations are necessary to generate evidence-based data for validation of these first results, especially regarding the aspect of the gingival thickening.

References