

## SOFT TISSUE HEALING WITH A NEW XENOGENIC COLLAGEN MATRIX IN POST-EXTRACTIVE SOCKET SEALING PROCEDURES: PRELIMINARY RESULTS OF A PROSPECTIVE COHORT STUDY

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The recent introduction of xenogenic collagen matrixes further expanded the clinical alternatives in the management of soft tissues healing during pre-implant or peri-implant regenerative procedures. The aim of this prospective cohort study is to test the performance of a new xenogenic collagen matrix (Mucoderm®, Botiss Dental, Germany) as a socket sealing material, to allow second-intention healing of post-extractive sockets filled with a xenogenic bone substitute or with an immediate submerged implant.

10 patients (4 males and 6 females - mean age: 53.2 years) were recruited, presenting with a single-rooted tooth scheduled for extraction, because of unsalvageable endo-perio lesions or vertical root fractures. After atraumatic tooth removal, the post-extractive alveolus received either a socket preservation procedure or an immediate submerged implant. Demineralized bovine bone mineral integrated in a 10% collagen matrix (Bio-Oss Collagen®, Geistlich Pharma, Switzerland) was used as a socket preservation material or to fill the gap between the implant surface and the bony walls of the alveolus. In both cases, the gingival margins of the alveolus were sealed with a xenogenic collagen matrix (Mucoderm®, Botiss Dental, Germany). Through 5/0 monofilament sutures, the matrix was gently stabilized subperiosteally under the palatal and buccal gingival margins of the socket for 2/3 of its surface, whether 1/3 remained exposed for second intention healing. In such a way the submerged surface of the matrix received vascular support from the bone crest and the periosteum, whether the exposed third of the matrix received no direct support from the oral cavity and from the underlying implant/xenograft. The following parameters were evaluated: a) exposed surface of the matrix at the end of surgery (T0); b) soft tissue healing at 1, 4, 6, and 8 weeks from surgery (T1-4); c) aesthetic performance provided by the socket sealing material, quantified deriving the colorimetric score  $\Delta E$  between the regenerated site and the surrounding gingiva, 8 weeks after surgery (T4); d) histological aspect of gingiva samples, harvested 20 weeks after surgery (T5) from the regenerated area.

a) the mean postoperative exposure area of the matrix was 26,25 mm<sup>2</sup> (14,2 to 38,84 mm<sup>2</sup>); b) 8 weeks after surgery (T4), full wound closure was achieved in 9 out of 10 sites with healthy keratinized tissue. A single patient (#3) did not achieve full wound closure at T4, starting from the highest postoperative matrix exposure rate of the cohort (38,84 mm<sup>2</sup>); c) the mean colorimetric score  $\Delta E$  between the regenerated site and the surrounding gingiva at T4 was 3,76 (3 to 6,55). Seven out of 10 patients reported an excellent aesthetic integration of the matrix ( $\Delta E$  score < 3,7). Two patients reported an acceptable integration of the matrix ( $\Delta E$  = 3,95 and 4,28) and only a single patient (#3) reported a limited aesthetic result ( $\Delta E$ =6,55) at T4; d) the histological evaluation of gingiva samples at T5 revealed the presence of healthy keratinized gingival tissue, with no signs of aberrations or anomalies.

Preliminary results from this study suggest that this new xenogenic porcine-derived collagen matrix could represent a valuable alternative to allow second intention healing of post-extractive sockets filled with a xenogenic bone substitute or with an immediate submerged implant. Further investigations are required to assess what extent of postoperative matrix exposure allows uneventful soft tissue healing with full wound closure, adequate keratinization and high aesthetic performances.