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What grafting materials produce greater alveolar ridge preservation after tooth extraction? A systematic review and network meta-analysis

ABSTRACT

As, after tooth extraction, alveolar bone remodeling may compromise the subsequent dental implant rehabilitation, many bone-substitute materials have been suggested for alveolar ridge preservation and in order to reduce the natural collapse in the socket. The purpose of this systematic review was to examine the clinical performances of different grafting materials for alveolar preservation after tooth extraction, using a frequentist network meta-analysis. The electronic search was carried out on Embase, PubMed, Cochrane Library, Web of Science, Scopus, LILACS, and grey literature up to March 22, 2020 (registration number INPLASY202030005). Only randomized controlled trials were included and the primary outcomes were the alveolar width resorption 1 mm below the alveolar crest and buccal height resorption in millimeters. Of the 4379 studies initially identified, 31 studies involving 1088 patients were included in the quantitative analyses, comparing 25 different bone-substitute materials. The network meta-analysis evidenced that eight bone-substitute materials showed greater maintenance of alveolar width and height after tooth extraction, with a statistically significant difference when compared with natural healing, with the following mean width differences: OsteoBiol® Apatos® (Tecnoss®, Giaveno, Italy), 2.27 [1.266-3.28]; Bio-Oss® (Geistlich), 0.88 [0.33-1.42]; Bio-Oss Coll® (Geistlich), 0.53 [0.04-1.01]; Bond-apatite® (Augma), 2.20 [1.30-3.11]; freeze-dried bone allograft, 1.35 [0.44-2.26]; OsteoBiol® Gen-Os® (Tecnoss®), 1.90 [0.60-3.20]; platelet-rich fibrin, 1.66 [0.66-2.67]; and OsteoBiol® mp3® (Tecnoss®), 2.67 [1.59-3.75]).

CONCLUSIONS

This systematic review focused on the bone changes measured 3-6 months after tooth extraction, providing updated information on the efficacy of different bone-material substitutes for alveolar preservation after tooth extraction. In general, bone-substitute materials are effective in reducing alveolar changes after tooth extraction and in authors' opinion xenograft materials should be considered as among the best of the available grafting materials for alveolar preservation after tooth extraction.

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