

# Tissue engineered bone using mesenchymal stem cells versus conventional bone grafts in the regeneration of maxillary alveolar bone: A systematic review and meta-analysis



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## Biography

Hesham Al Sharani has completed his Master degree from Jinzhou Medical University, China. He currently works as a lecturer and researcher at Ibb University, Yemen. The main fields of his research direction include bone regeneration and tissue engineering.



## Abstract

**Purpose:** The aim of this study was to compare tissue-engineered bone using mesenchymal stem cells (MSCs) and conventional bone grafts in terms of histomorphometric outcome, bone gained, and implant failure in the atrophic maxilla.

**Materials and methods:** A systematic review and meta-analysis of randomized clinical trials (RCTs) was conducted. An electronic search of several databases was performed. RCTs comparing tissue-engineered bone using MSCs to bone graft alone in rehabilitation of the atrophic maxilla were included. Outcome variables were a mean percentage of new bone formation, residual graft particles, and connective tissue. Bone gained and implant failure rate were also assessed. Risk ratio (RR) or standardized mean differences (SMD) were statistically analyzed.

**Results:** A total of 190 augmented sites enrolled in 12 RCTs were included in this study. Nine of the 12 RCTs included 153 maxillary sinuses that underwent sinus elevation, and three RCTs included 28 patients with bone grafting only. There was no significant increase in new bone formation between the two groups at 3 to 4 months (SMD = -0.232, CI, -0.659 to 0.195, low-quality evidence). However, at 6 months post-grafting, a statistically significant increase in new bone formation was found in favor of the tissue-engineered bone using the MSC group (SMD = 0.869%, CI, -1.98 to 9.310, moderate-quality evidence). No substantial difference was found between the two groups with respect to residual graft particles, connective tissue, bone gained, and implant failure rate (RR = 2.8, CI: 0.517 to 16.6, P = .226, very low-quality evidence).

**Conclusion:** There is moderate- to very low-quality evidence supporting the use of tissue-engineered bone using MSC therapy in maxillary alveolar bone regeneration compared with conventional bone grafting without MSCs.

This paper aims to summarize on the righteous ways to be followed in clinical scenario in the diagnosis and investigations of the lesions affecting oral soft and hard tissues.

[6th World Congress on Dentistry and Dental Materials](#) | August 26-27, 2020

**Citation:** Hesham Al Sharani, Tissue engineered bone using mesenchymal stem cells versus conventional bone grafts in the regeneration of maxillary alveolar bone: A systematic review and meta-analysis, World Dental 2020, 6th World Congress on Dentistry and Dental Materials, August 26-27, 2020, 05.