Gomez-Barrena, Rosset P, et al. Bone fracture healing: Cell therapy in delayed unions and nonunions. Bone 2015;70:93-101.

Design: narrative review of basic scientific, preclinical, and early clinical studies

Purpose of study: to review current knowledge of cell-based therapies such as mesenchymal stem cells in the treatment of delayed union and nonunion of long bone fractures

Reasons not to cite as evidence:

- The paper is a well-documented review of current understandings of the pathophysiology of delayed union and nonunion of long bone fractures, and presents clear descriptions of the proposed mechanisms of investigational interventions for promoting bone healing
- However, these investigational interventions are largely in the preclinical stage, with many preliminary clinical studies either in the process of recruiting patients or awaiting publication of results for studies which have been completed
- The discussion makes it clear that the lack of evidence on current tissue engineering interventions reflects the insufficient number of clinical trials with standardized and preclinically well-supported cell products
- The regenerative capabilities of current biomaterials appear to be limited to the treatment of small bone defects
- A major criticism noted by the authors is that available trials suffer from a lack of protocol adherence, patient heterogeneity in small trials, and insufficient information about the cell product to correlate with trials done in different centers
- At the present time, it is safe to say that cell therapy is experimental and investigational for the treatment of problems relating to delayed union or nonunion of long bone fractures