

In vivo healing of meniscal lacerations using bone marrow-derived mesenchymal stem cells and fibrin glue.

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Publication Date: 2012

Abstract:

Fibrin glue created from a patient's own blood can be used as a carrier to deliver cells to the specific site of an injury. An experimental model for optimizing various permutations of this delivery system in vivo was tested in this study. Harvested equine meniscal sections were reapposed with fibrin glue or fibrin glue and equine bone marrow-derived mesenchymal stem cells (BMSCs). These constructs were then implanted subcutaneously in nude mice. After harvesting of the constructs, BMSC containing constructs showed significantly increased vascularization, and histology showed subjectively decreased thickness of repair tissue and increased total bonding compared to fibrin alone constructs. This model allowed direct comparison of different meniscal treatment groups while using a small number of animals. This in vivo model could be valuable in the future to optimize fibrin and cellular treatments for meniscal lesions in the horse and potentially humans as well. © 2012 Dora Ferris et al.