Stimulatory Effect of Autologous Adipose Tissue-Derived stromal Cells in an Atelocollagen Matrix on Wound Healing in Diabetic db/db Mice

Abstract

We aimed to evaluate the effectiveness of the application of an atelocollagen matrix containing autologous adipose tissue-derived stromal cells (ASCs) on wound healing in diabetic (*db/db*) mice. Cultured ASCs from *db/db* mice and from *db/+* mice secreted identical amounts of growth factors, cytokines, and type I collagen. ASCs from *db/db* mice proliferated at the same rate as those from *db/+* mice. When DiI-labeled ASCs were applied to full-thickness round skin wounds on the backs of diabetic *db/db* mice, histological observation at 2 weeks showed that red fluorescent-labeled tissues were formed in the epidermis, dermis, and capillaries. Twelve *db/db* mice were treated with either matrix alone or matrix containing ASCs and then sacrificed at 1 or 2 weeks. A histological examination demonstrated significantly advanced granulation tissue formation, capillary formation, and epithelialization in those wounds treated with atelocollagen matrix containing ASCs, compared with wounds treated with matrix alone.