Synopsis of Original Research Paper

Migration of Bone Marrow-Derived Cells and their Contribution to Collagen Production during Skin Fibrogenesis

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Skin fibrosis is characterized by an excessive deposition of type I collagen and other components of extracellular matrix. Several recent studies have shown that bone marrow (BM)-derived cells migrating into wounded skin produce type I collagen and may contribute to accelerating wound healing. It is unknown, however, whether BM-derived cells also participate in the progression of pathological skin fibrosis. In the present study, we utilized a transgenic mouse strain that harbors a tissue-specific strong enhancer sequence of α2(I) collagen gene (COL1A2) linked to its proximal promoter and an enhanced green fluorescence protein (EGFP) reporter gene (COL/EGFP). Following a subcutaneous bleomycin injection, there were a large number of EGFP-expressing mesenchymal cells observed in the thickened dermis. BM cells obtained from COL/EGFP transgenic mice were transplanted into lethally irradiated syngeneic animals to replace their BM with COL/EGFP-positive cells. In those recipient mice, only a limited number of EGFP-positive BM-derived collagen-producing cells were observed in the fibrotic skin tissue following a bleomycin injection. These results therefore indicate that skin resident cells, but not BM-derived cells, are the major players producing collagen during skin fibrogenesis.