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Cord lining mesenchymal stem cells enhances collagen in tissues regeneration

This study investigates whether the application of Cord Lining-Mesenchymal Stem Cells (CL-MSCs) improve collagen architecture, using Transmission Electron Microscopy (TEM) microscopic study to examine the collagen fiber diameter and orientation. The study utilised 6 pigs, with 6 wounds created onto each pig. The 6 pigs were randomly divided into three groups, with CL-MSCs delivered through (i) topical route (ii) intraperitoneal route and (iii) control group. Histopathological analysis and evaluation of collagen fibers were evaluated through Masson's Trichrome stained photographs. The photographs were viewed and analyzed using Philips IMS v2.4 to study the collagen architectural of the tissues biopsied. Transmission Electron Microscopy was used to evaluate collagen ultrastructure, based on fiber orientation and fiber diameter. The treated tissues showed accelerated collagen deposition in the granulation tissues of the CL-MSCs treated tissues. The median percentage of collagen deposition was highest for IP treated tissues. The control tissues consistently contain the lowest percentage of collagen deposition, either barely resurfaced or not resurfaced at all and with collagen fibers that were loosely arranged with no dominant direction. The collagen fibers in the treated tissues were thicker and stronger in appearance, while the fibers of the control tissues were delicate and frail. This study shows that the collagen fibers in tissues from CL-MSCs treated pigs were more mature in appearance. The fibers in CL-MSCs treated tissues were bundled into a neat pattern and have significantly thicker fibers as compared to control tissues. Collagen fibers from the control tissues were frail and weak in appearance, disorganized and scattered throughout all examined time points, and evidently the narrowest fibers.

Keywords: Stem Cells, Tissue Regeneration, Collagen, Aging, Anti-Aging

Biography

Fui Ping specialized in the field of skin and wound studies. Her doctoral research focuses on diabetic wound healing, using mice and pigs as wound model system to investigate the underlying mechanisms of cord lining mesenchymal stem cells and their consequences in skin and wound repair.

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