

Fat cell transplantation benefits systemic sclerosis patients with non-healing digital ulcers

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Digital ulcers (DUs) are a frequent, painful, and quality of life altering complication for patients with systemic sclerosis (SSc), a connective tissue disease causing a progressive loss of small blood vessels and resulting changes in organs and tissues. DUs on the fingertips of SSc patients are slow to heal, if they heal at all, as many are unresponsive to any therapies.

However, a team of researchers in Italy has found that local implants of autologous (self-donated) adipose (fat) tissue-derived cells (ATDCs) resulted in significant pain reduction and healing within two to seven weeks post-transplantation for all 15 patients with long-lasting, non-healing DUs who enrolled in their study.

Study results, to be published in a future issue of *Cell Transplantation*, are currently freely available on-line as an unedited early e-pub at: http://ingentaconnect.com/content/cog/ct/pre-prints/content-CT-1325_Del_Papa_et_al

"DU healing and significant improvement in DU-related pain in all of the patients in the study can certainly be regarded as extremely positive," said study co-author Dr. Nicoletta Del Papa of the U.O.C. Day Hospital Reumatologia in Milan, Italy. "However, why the local implantation of ATDC fraction-containing ASCs along with a stromal/vascular cell (SV) component induced such positive changes in the DUs of patients with SSc remains speculative."

The researchers suggested that, as demonstrated in several in vitro and in vivo studies, locally implanted ASCs are capable of producing a number of growth factors with pro-angiogenic (blood vessel growing) and proliferation-inducing factors, such as endothelial growth factor and fibroblast growth factor. Also, the SV component likely played a role in the positive outcomes.

"Recent data shows higher angiogenic potential of freshly isolated ATDCs when the SV fraction component is included as opposed to when the SV fraction is reduced," explained Dr. Del Papa.

The researchers also noted that ATDCs are "an attractive alternative" to using bone marrow-derived mesenchymal stem cells (BMSCs) in the procedure because ATDCs are more easily isolated, are more abundant, and are more rapidly expanded than BMSCs.

"Our study suggests that autologous transplantation of the ATDC fraction may be a viable option for inducing improvement or healing in ischemic, SSc-related DUs that are resistant to traditional therapeutic approaches," concluded the researchers. "While the positive outcomes need to be confirmed in larger, controlled studies, our favorable outcome suggests that the local grafting with ATDCs could represent a promising option for the treatment of SSc-related DUs."

"ATDC transplantation including the stromal vascular fraction led to more complete recovery in patients with digital ulcers," says Maria Carolina Oliveira Rodrigues of the Ribeirão Preto Medical School - University of São Paulo, Brazil and section editor of *Cell Transplantation*. "These promising results should be validated by a clinical study utilizing a larger cohort of patients as well as studies to help determine the reasons for the beneficial effect of the SV component."

Source:

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