

Complete wound healing in a month with the use of autologous adipocyte tissue derived- Mesenchymal Stem Cells in a non-healing diabetic ulcer. A case report
Triantafyllos Didangelos¹, Georgios Koliakos², Stamata Georga³, Katerina Kotzampassi⁴, Dimitrios Karamanos⁵, Kokkona Kouzi-Koliakou⁶, Fotios Iliadis¹, Alkmini Pavlidou¹, Georgios Arsos³, Apostolos Hatzitolios¹ 1) Diabetes Center, 1st Propedeutic Dept. of Internal Medicine, “AHEPA” Hospital, Aristotle University of Thessaloniki. 2) Dept. of Biochemistry Aristotle Uni. of Thessaloniki, 3) Laboratory of Nuclear Medicine, “Papageorgiou” Hospital, Aristotle Uni. of Thessaloniki, 4) Dept. of Surgery, , “AHEPA” Hospital, Aristotle Uni. of Thessaloniki, 5) Dept. of Vascular Surgery, “Papageorgiou” Hospital, Aristotle Uni. of Thessaloniki, 6) Dept. of Histology-Embryology, Aristotle University of Thessaloniki, GREECE

There is a demand for therapies to promote the efficient resolution of hard-to heal wounds with minimal appearance of scarring. Recent in vitro studies with Mesenchymal Stem Cells (MSCs) have identified numerous mechanisms by which these cells can promote the process of wound healing, and there is significant interest in the clinical translation of an MSC-based therapy to promote dermal regeneration. The aim of the present study was to investigate the efficacy of the adipocyte tissue derived- MSCs in a non-healing diabetic ulcer. Case presentation: A woman with Diabetes Mellitus (DM) type 1, aged 47 years old, with duration of DM 24 years, presented for first time two years ago, with a non-healing ulcer in the plantar surface of the right foot under the second metatarsal head. Osteomyelitis observed after the first visit of the patient in our outpatient clinic with Magnetic Resonance Imaging. The patient received treatment with antibiotics for six months and at the end of the treatment, the labelled white blood cells scan was normal. But, there was not evidence of closure of the ulcer for another six months, despite our efforts. So, we decided to apply autologous adipocyte tissue derived- MSCs to the site of the ulcer. A piece of about 60ml adipose tissue was collected by lipectomy performed by a surgeon from the abdominal subcutaneous area under local anesthesia. For the preparation of adipose tissue derived stromal vascular fraction (SVF) and the method of collagenase digestion was applied. The cells were then rate controlled frozen and stored in liquid nitrogen until use. Before application the cells were rapidly defrozen at 40°C washed twice with PBS, and resuspended in 2mL of the patient’s serum. Injection of the MSCs in the ulcer site made in April 2013. After a month of the MSCs injection there was complete closure of the ulcer with normal dermal appearance. No side effects observed during the follow up period. After 8 months of follow up there is still complete healing of the ulcer. In conclusion, administration of autologous adipocyte tissue derived- Mesenchymal Stem Cells achieved complete healing of the diabetic refractory to other treatment ulcer. This intervention may be helpful for other same cases in future.