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Use of adipose-derived mesenchymal stem cells in wound healing: a case report

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Complex lower-limb wounds with exposure of nerves and vessels pose challenges in orthopedics. Regenerative medicine via fat aspirate appears to be an option. Adipose tissue is rich in mesenchymal stem cells and pericytes, which modulate inflammation and angiogenesis, accelerating repair in difficult-to-heal beds. Male patient, 33 years old, with an open fracture GA IIIb in the ankle after a motorcycle accident. It evolved with necrosis, dehiscence, and exposure of the synthesis material after ORIF. It had a fibrotic bed and no border progression. Under anesthesia, infraumbilical liposuction was performed, with mechanical processing in a closed system to obtain Microfragmented Adipose Tissue (MFAT). The product was injected retrograde along the wound edges and into the wound bed. In the first week post-MFAT, exuberant granulation was observed. In the third week, Figueiredo dressing was used to protect the tissue. After eight weeks of MFAT application and five weeks of Figueiredo dressing, the patient underwent successful autologous skin grafting. The technique allowed the reconstruction of the microvasculature, enabling coverage by a simple graft at the expense of complex surgical flaps. MFAT preserves the microvascular unit, allowing pericytes to become active stem cells at the site of injury. The technique stands out for its low morbidity in the donor area and its ability to convert stagnant wounds into pro-regenerative environments. This allows restoration of the microvasculature and acceleration of epithelialization, making conventional skin grafts viable in previously devitalized tissues. The use of MFAT has been shown to be a safe and effective adjunctive therapy for complex orthopedic wounds. The technique optimizes hospital stay length and enables less invasive coverage procedures in settings where they would initially be contraindicated.

Keywords: Wound Healing; Adipose Tissue; Regeneration.

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