

Fat grafting associated with negative pressure wound therapy : Five years of follow up treating complex wounds in the inferior limb

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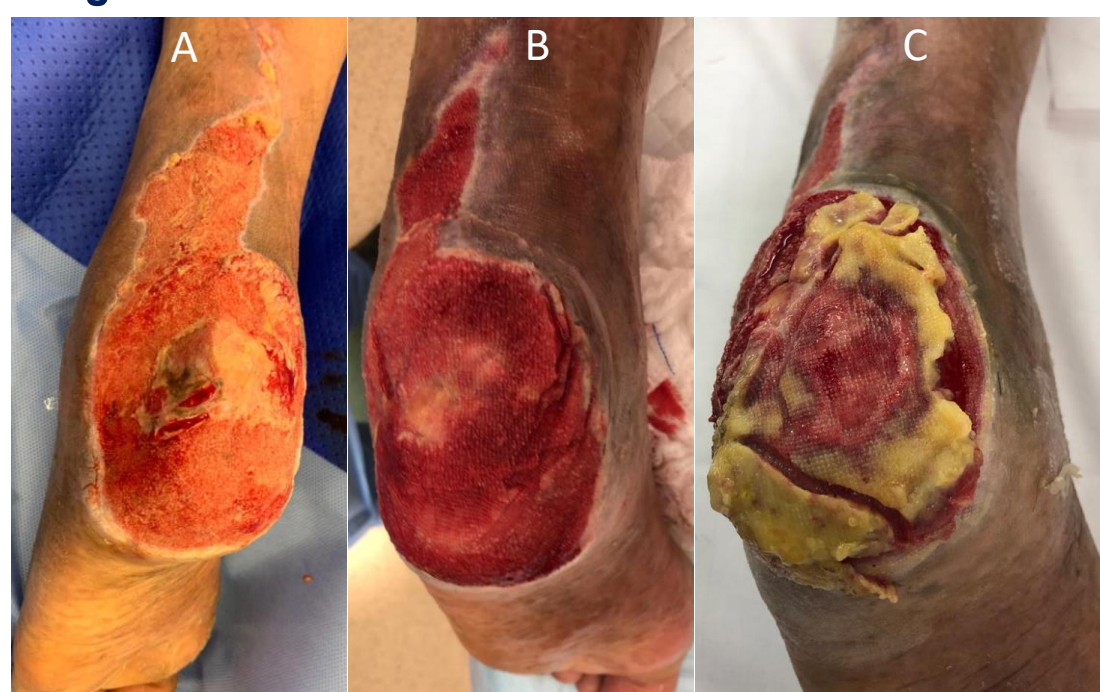
Introduction: The treatment of wounds has always been a major issue in medical practice. It has also represented one of the most antique challenges in the history of medicine. The objective is to describe the major results of a case series of different complex wounds in the inferior limb treated with the association of fat grafting and negative pressure wound treatment.

Method: Different kinds of complex wounds in the inferior limbs were treated with fat grafting (FG) on the wound bed and wound borders, associated with negative pressure wound therapy (NPWT). Fat was collected from a donor site with a 4mm cannula ("macro" granulated fat). After the cleaning of the wound bed to remove necrosis and devitalized tissue, the construction of "fat pouch" for fat grafting over the wound, is followed by the placement of NPWT over the fat pouch. The NPWT is maintained, in average, for one week. During dressing removal after one week, another session of FG and NPWT or another session of NPWT, alone, is performed. Once granulation tissue is obtained, skin grafting was performed.

Discussion: As expected, the neovascularization and anti-inflammatory stimuli of fat graft and of NPWT were observed. The antifibrotic effect of fat graft was also observed. But covering metal plate was completely unexpected. Covering entire tendons and reconstruction entire parts of the inferior limbs were also unseen clinical signs of fat grafting, so far. Very favorable results were noticed. The roll of autologous FG, in natura, in the treatment of complex wound is a very recent field in the literature, with good results. The combination of NPWT associated with FG showed results, that would never been obtained by NPWT alone. An evolution on the concept of FG, in natura, as a true biological autologous matrix was observed and represented a paradigm breaking point in the treatment of complex wound of the inferior limbs.

Conclusion: After five years of follow up of the combination of FG and NPWT in the treatment of complex wound in the inferior limb, very good and promising results were registered with complete healing and a new roll for fat grafting over wounds was observed.

Figure 1



A: Exposed calcaneal bone after reversed sural flap loss
B: Formation of new tissue over after two sessions of FG + NPWT
C: Integrated, adherent fat graft on wound, unexpected observation

Results: Since 2019, 40 patients, from 8 years of age to 83 years of age were treated using this method. All the 40 cases healed completely. The average time of treatment took 30 days, with two sessions of fat grafting and three sessions of NPWT. The described method of the association of FG and NPWT was capable to heal difficult and complex wounds, where flaps were lost or weren't available. Among all cases, exposed bone, a exposed metal plate, exposed tendons, exposed articular cartilages were treated by this method. A very low morbidity in the patients was noticed with this method.

Figure 4



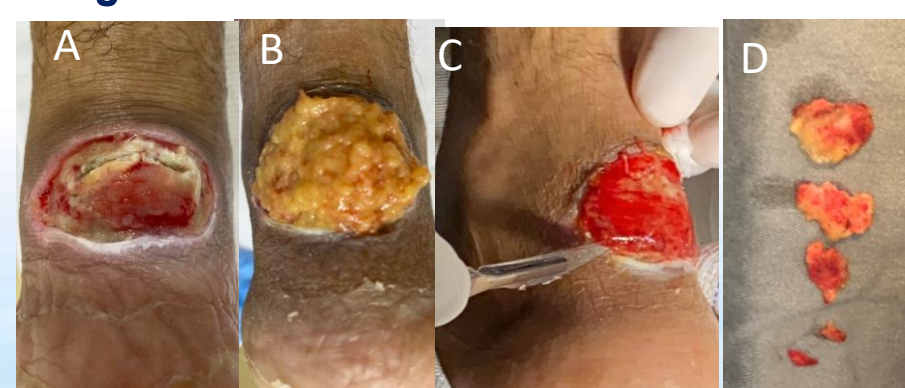
A: Exposed metal plate on the medial aspect of the ankle after osteotomy.
B: Fat graft associated with NPWT, first dressing change.
C: Integrated and vascularized fat graft after 1 month post op.

Figure 2



A: Complex explosion of the ankle after 10 meters high fall
B: graft adherent and integrated to the wound after one week
C: Fat graft adherent and integrated to the wound after two weeks
D: Complete healing after three months. (One session only of FG)

Figure 3



A: Complex wound on posterior aspect of the ankle.
B: Fat grafting after 10 days adherent to the wound bed.
C: Cutting the compact fat graft until bleeding is observed.
D: specimen of fat slices cut from the wound

E: Mitosis activity
F: Vascular endothelial growth factor (VEGF)
G: Fibroblast activity

