

## FAT GRAFTING ASSOCIATED WITH NEGATIVE PRESSURE WOUND THERAPY FOR LOWER EXTREMITY RECONSTRUCTION: CASE SERIES

SOUZA, Gustavo M.C.<sup>1</sup>; FARIA, Kevin C.M.<sup>2</sup>; BOTTINO, Alice P.<sup>2</sup>; GANDRA, Silvia V.S.<sup>3</sup>; COSTA, Sérgio M.C.<sup>3</sup>; SOBRAL, Christiane S.<sup>4</sup>; FERREIRA, Lydia M.<sup>5</sup>

### Abstract

**Introduction:** Complex wounds represent a common topic in plastic surgery. In the 21<sup>st</sup> Century new options of treatment were reported, such as negative pressure wound therapy (NPWT), fat grafting (FG) and biological matrices. **Objective:** To present a case series of fat grafting (FG) associated with negative pressure wound therapy (NPWT) in the treatment of complex wounds of the lower extremity. **Method:** descriptive, analytic, observational, prospective case series of complex injuries of the lower extremity. **Results:** From march 2019 to april 2020, ten cases were treated. Among these cases, exposures of noble tissues were bone (7), tendon (3), articular cartilage (3), biomaterial (2). The average mean time of treatment was 27 days. Three cases were treated with only one session of FG with NPWT, six cases needed two sessions, and one case consumed 4 sessions of FG with NPWT (mean: 1,9 session per case). After this further isolated sessions of NPWT were applied in some cases, until complete granulation tissue formation was noted (mean: 2,9 sessions of NPWT per case in total period of treatment). Split thickness autologous skin grafts were needed for final coverage of the wound in nine cases. No complications were observed. In the follow up period, one case of calcaneous tendon exposure failed, after one month, due to additional new trauma on the thin grafted skin during rehabilitation sessions. **Discussion:** This case series of association of FG and NPWT is an unprecedented research. The only experimental study on this topic is reported by Kao et al. (2015), where denuded cranial vaults of rats were used. In this case series accelerated granulation tissue formation was observed, preventing the need of more complex reconstruction method such as microsurgery.

All cases of complex wounds with irregular surfaces and exposed noble structures (bone, tendons and articular cartilage) healed.

The use of autologous fat grafting for soft tissue reconstruction following major extremity trauma is a paradigm breaker. Fat grafting on wounds has the benefit of the stimulus of multiple growth factors and adipose derived mesenchymal cells. NPWT is known to stimulate granulation tissue formation on the wound, also enhancing its vascularity. The association of these two technologies seemed to have boosted the stimulus towards granulation tissue formation, with additional properties. It has revealed fat graft as an autologous biological matrix with a filler effect, providing very smooth and vascularized surfaces within very irregular and complex injuries. Very low morbidity and no complications were observed with this treatment.

<sup>1</sup>Fellow Master, Universidade Federal de São Paulo (UNIFESP, [gustavomcsouza@gmail.com](mailto:gustavomcsouza@gmail.com))

<sup>2</sup>MD, [drkevincarvalho@gmail.com](mailto:drkevincarvalho@gmail.com); [alice.pizzolantebottino@gmail.com](mailto:alice.pizzolantebottino@gmail.com) ; [silviavsgandra@hotmail.com](mailto:silviavsgandra@hotmail.com)

<sup>3</sup> Head, [sergio.plastica@bol.com.br](mailto:sergio.plastica@bol.com.br)

<sup>4</sup>PhD, [chrisssobral@me.com](mailto:chrisssobral@me.com)

<sup>5</sup>Head, Full Professor, UNIFESP, Researcher 1<sup>a</sup>-CNPq, Director Medicine III-CAPES, São Paulo-SP, Brazil. Critical revision. [lydiamferreira@gmail.com](mailto:lydiamferreira@gmail.com)

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**Conclusion:** The association of FG and TFPN treated successfully all cases of this series. It is a new possibility for lower extremity reconstruction. This new combination will not only increase the indications and the applications of NPWT worldwide, but will also enhance its capacity in the healing process with almost no additional cost.

**Key Words:** Autologous Transplantation; Fat Grafting; Injuries; Lower Extremity; Negative Pressure Wound Therapy; Wound Healing

<sup>1</sup>Fellow Master, Universidade Federal de São Paulo (UNIFESP, [gustavomcsouza@gmail.com](mailto:gustavomcsouza@gmail.com))

<sup>2</sup>MD, [drkevincarvalho@gmail.com](mailto:drkevincarvalho@gmail.com); [alice.pizzolantebottino@gmail.com](mailto:alice.pizzolantebottino@gmail.com) ; [silviavsgandra@hotmail.com](mailto:silviavsgandra@hotmail.com)

<sup>3</sup> Head, [sergio.plastica@bol.com.br](mailto:sergio.plastica@bol.com.br)

<sup>4</sup>PhD, [chrissobral@me.com](mailto:chrissobral@me.com)

<sup>5</sup>Head, Full Professor, UNIFESP, Researcher 1<sup>a</sup>-CNPq, Director Medicine III-CAPES, São Paulo-SP, Brazil. Critical revision. [lydiamferreira@gmail.com](mailto:lydiamferreira@gmail.com)