

Study summary

Investigation of the fat cell protecting effect of *Liposat® Pro plus* in combination with the *Vibrasat® Pro* and the *Vacusat® power*

Insights from handling - Dr. rer. nat. Jan Hönnemann, June 2020

Introduction and Aim:

The study presented here on the fat cell protecting effect is a complete test of Möller Medical's **Aesthetics Solutions Portfolio**. The interaction of the infiltration pump *Liposat® Pro plus* with the vibrating handpiece *Vibrasat® Pro* and the *Vacusat® power* was investigated. Two 4 mm cannulas, one basket and one Mercedes cannula, also from Mölller Medical, were used.

The viability of primary fat cells from cell cultures was investigated to find out how a liposuction treatment with subsequent re-infiltration of the fat obtained, using the above-mentioned medical devices, affects the viability and thus the treatment result of infiltrated fat cells. From this, conclusions can also be drawn about the optimal healing process and the expected results of an intervention.

It has been shown that mechanical stress significantly reduces adipocyte growth and differentiation (1). So, a pump potentially damages viable fat cells during lipofilling which might result in a negative impact on patient healing and the expected end result.

With the study on primary fat cells in a simulated lipofilling process carried out in a cell biology laboratory, Möller Medical's aim is to prove how an optimal cell protecting and stress-less treatment can be carried out and what factors are important.

Material and Methods - summary:

Here, primary human preadipocytes were grown in cell culture and transferred in a liquid phase containing adipocyte growth media and TLA. This cell solution was used to carry out the tests with the *Liposat® Pro plus* with an infiltration speed of 250 ml/min. Survivability was tested by re-plating out the cells and photometrically detecting metabolic activity after 16 h via MTT assay.

Results:

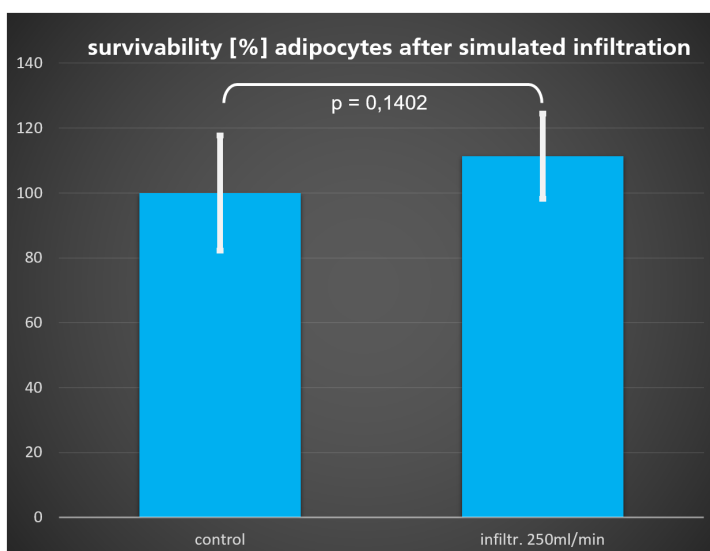


Figure 1: survivability of adipocytes: control group n=6 100% ± 17,67% compared to cells infiltrated with 250 ml/min n=5 with 111,29% ± 12,64%. Both groups show no statistical differences ($p > 0,05$) in a one-tailed type 1 t-test.

Data provided in Figure 1 shows that there is no statistical difference in cellular viability after 16h between the untreated control group and the adipocytes going through a simulated lipofilling process using the Liposat® Pro plus with a pump speed of 250 ml/min.

Conclusion and outlook:

The study strongly suggests that Möller Medical Aesthetics Solutions in combined application can contribute to optimal survival of the adipocytes obtained during liposuction. It can be seen that Möller Medical Aesthetics Solutions collaborates, when used holistically, to aid optimal fat cell protection due to their sophisticated technology designed to worked together. They demonstrably support a simple and above all safe working method. This enables the user to achieve the best possible results for patients and to prevent healing disorders.

The pump rotor used in the Liposat® Pro plus and already used in dialysis reduces pressure and shear forces during opening, and therefore mechanical stress on adipocytes when closing the rollers. A constant flow rate and easily controllable pump speed also contributes to gentle handling of the extracted cells.

In addition, a moderate average infiltration rate has been proven to be beneficial for the survival rate of adipocytes. For further consideration, an investigation of the influence of different infiltration rates on the survival of adipocytes is recommended.

Literature:

- (1) The effect of mechanical stress on the proliferation, adipogenic differentiation and gene expression of human adipose-derived stem cells (Nora E. Paul, Bernd Denecke, Bong-Sung Kim, Alice Dreser, Jürgen Bernhagen, Norbert Pallua) Journal of Tissue Engineering and Regenerative Medicine, Jan 2018