

Hemodynamic effects of different compression materials

A. Ladwig¹, H. Haase¹, M. Abe², M. Jünger¹

¹Department of Dermatology, Ernst-Moritz Arndt- University of Greifswald, Germany

²Lohmann & Rauscher GmbH & Co. KG, Rengsdorf, Germany



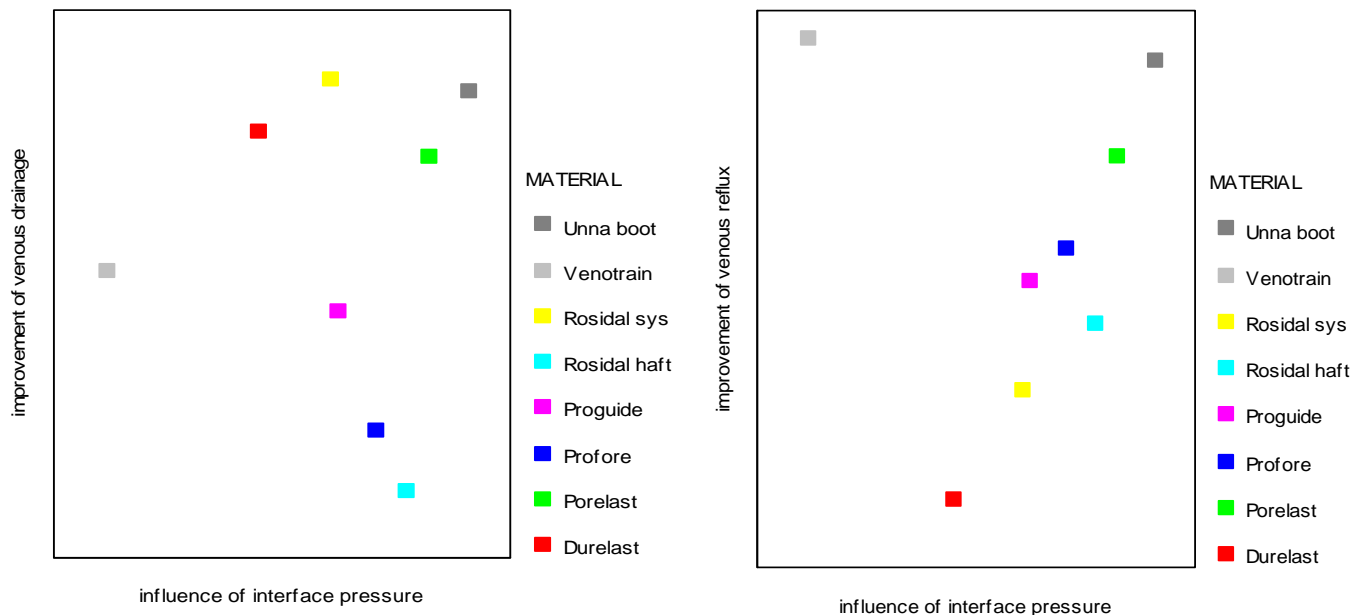
Introduction

- stiffness and interface pressures as main physical properties of compression material
- aim: measurement of effects of various compression materials in relation to venous hemodynamics of the lower limb.

Material and methods

- test of 8 different compression materials, (especially the bandages Rosidal haft (cohesive), Porelast (adhesive), Rosidal sys (short-stretch), Durelast (very short stretch), Unna boot (zinc-paste bandage with short-stretch on top) and thigh high stocking Venotrain® micro, 25 mmHg)
- 10 patients suffering from venous insufficiency
- measurements of venous drainage, venous reflux and interface pressure (supine, sitting, dorsal flexions, active standing)
- by means of strain gauge plethysmography (Gutmann) and measurement of interface pressure by means of an air filled cushion as pressure capture (ELCAT, method Blazek)
- evaluation of various factors, for example working interface pressure ratio, Static Stiffness Index, improvements of venous drainage, venous reflux during wearing a bandage/stocking and efficiency of hemodynamic improvements in relation to the amount of pressure in different positions
- calculation of the mean ranking for each compression material
- a factor analysis to reduce the mentioned factors to 3 summarizing scores (identified as improvement of venous reflux resp. venous drainage and influence of interface pressure)

Results of Factor Analysis



Conclusions

- best performance: Unna boot system and the adhesive Porelast (venous reflux as well as venous drainage)
- stiff materials have a better increase of venous drainage than elastic materials
- padding layers can prevent a good reduction of venous reflux (Rosidal sys)
- Thigh long compression stocking reduced venous reflux using low interface pressure (significant better efficiency compared to bandages).