

# Compression in chronic edema; the orthopedic aspect for the venous system

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Venous edema is the extravasal volume overloading of the tissue of the whole leg. The subfascial edema is responsible for the symptoms by an increased tension of the fascia due to this volume overloading. It is starting point for further venous diseases.<sup>1,2</sup> The edema either results from an insufficiency of the valves or a not sufficient working of the pumps. These both structures depend on the fascia.<sup>3-9</sup>

The fascia is a non-elastic structure with the architecture of a Chinese finger. It determines the tonus of the musculature.<sup>10,11</sup> Due to the angles of the Chinese finger a diffe-

rent tonus of the subfascial muscles results. Too big angles reduce the subfascial tonus (Figures 1 and 2).

The structure of the fascia depends on the posture. Only the right position of the foot guarantees the right tonus of the muscles. The footposition is depending neurologically on the afferences by the foot as the basal sensor of the body's coordination system. Mechanically it depends on the shoe.<sup>12</sup> Every wrong footposition changes the structure of the fascia. So for example a high heel on the shoe will increase the angles of the fascia and will lead to a reduction of the muscle tonus and an insufficiency of the valves.

Simultaneously the reduced movement of the joint wearing a high heel reduces the work of the ankle pump<sup>12-16</sup>

By harmonizing the fascia the natural compression effect by the muscle tonus will be guaranteed. Nonelastic compression therapy imitates the fascia and enables a high muscle tonus during contraction of the muscle as its natural principle.<sup>2,12,17</sup> Elastic com-

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Conference presentation: International Compression Club (ICC) Meeting, Rotterdam, 2018.

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Veins and Lymphatics 2018; 7:7994

doi:10.4081/vl.2018.7994

pression supports this anatomical situation.

The orthopedic aspect, a equilibrated balance of posture and position is the condition for the sufficient working of the valves as well as for the pumps. It depends fundamentally on the foot. So considering the foot based on its sensory task as well as its mechanical job is an efficient starting point for venous therapy. By a weak insole it could receive the necessary afferent stimulation for a balanced position. Proper footwear therefore plays a crucial role in treating venous problems.<sup>12</sup>

A



Größer 90 Grad larger

B



neutral

C



Kleiner 90 Grad smaller

Figure 1. Showing a mechanical model for the action of the fascia: A) by pushing the tubular model together (Chinese finger) the angles between the fibers will get larger, B) normal in the relaxed position, C) smaller when the model is stretched.

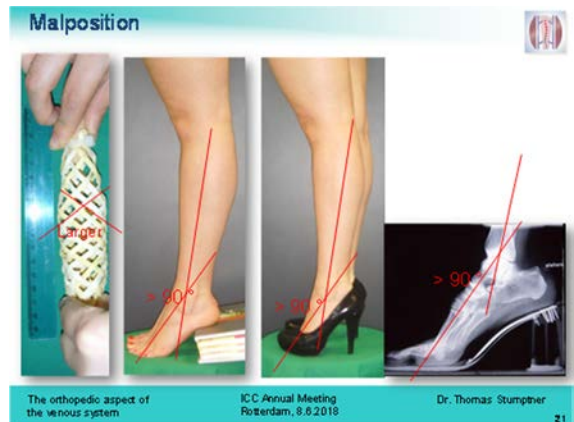


Figure 2. Demonstrating the effect of footposition on the calf: The muscle becomes pushed together passively by a heel. The angles of the fascia change. The tonus of the muscle reduces. An active contraction is no more possible.

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