

Compression film bandage: The first modality to provide continuous vein compression while allowing sports and showering

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Background

Continuous and effective compression has been a demand since the early days of sclerotherapy (FEGAN, Lancet 1963;2:109). Today, textile compression media (stockings, bandages) are a standard after invasive vein treatments. However, compression by stockings is often discontinued, at least over night, and bandages have to be frequently renewed. Procedures are exhausting and patient compliance is low.

A new compression film bandage (CFB, Fig. 1), put on once for a wearing time of two weeks, was evaluated with regard to practicability, the rate of inflammatory reactions and patient comfort.

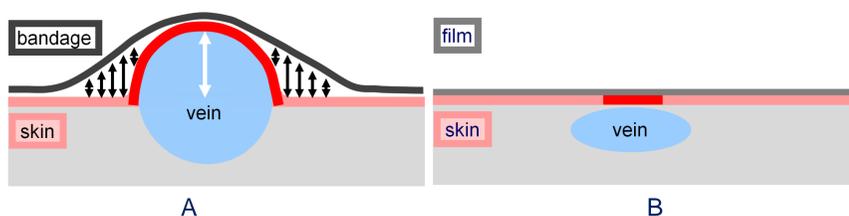


Fig. 1 A) protruding vein with bandage, B) vein fixed with adhesive film. The black arrows in A) indicate regions where adhesive forces of CFB may add to compression effects. By use of CFB the vein is compressed and proximity to the skin is reduced (red line).

Materials & Methods

The compression film bandage is a system consisting of a self-adhesive polymer film of $< 20\mu$ thickness (investigational, film: 3M/USA), water resistant but breathable by micropores, with elastic properties achieving pressures of 14 - 18 mmHg at the ankle region, with two supportive layers to facilitate positioning.

125 sportive patients (73 f, 52 m, 28 - 72 yrs.; > 30 min. amateur sports on > 3 days a week, > 4 showers a week) receiving foam sclerotherapy of superficial leg varicosities (4 - 12 mm \varnothing , 9/2014 - 5/2015) were randomized to group A: Continuously worn CFB plus compression stocking (CS) German class II by day (n = 50), group B: CS alone (n = 50), and group C: CFB alone (n = 25), all worn for 2 weeks. All activities including work and sports were suggested to be continued, as well as daily taking showers. Vein regression was registered by ultrasound and clinical examination after 2 and 4 weeks.



Fig. 2: Example of large varicosity at the calf; A: prior to treatment, B: during LSV laser and sclerofoam deployment via PhleboCath®; C: aftercatheter withdrawal; D: with compression film bandage, patient standing. Procedure time: 25 min.

Results

70/75 patients with CFB (93.3%, group A+C) completed 14 days of continuous wearing, while 4/75 (5.3%) had partial film dissolution after 8 -12 days due to sweating/intensive sports (> 1 h), and 1/75 (1.3%) had film displacement at the thigh due to stocking-induced tension (Fig. 3). There were no adverse events.

After 2 weeks, all target veins were closed. Superficial varicosities compressed with CFB (groups A, C) showed a diameter reduction increased by 16 - 42% (mean: 28.2%) compared to CS, with homogenous ultrasound patterns (Fig. 6). Symptomatic inflammations, indurations or discolorations were observed in 3/75 (4%) when using CFB versus 31/50 (64.0%) with CS alone (Tab. 1). This difference was statistically highly significant ($p < 0.01$).



Fig. 3: Thigh varicosity (A), 1 w. (B), 4w. (C)



Fig. 4: Popliteal varicosity before (A) - day 2 (B)



Fig. 5: A: Varicosity including knee region B: film, C: 2 weeks., D: film removed

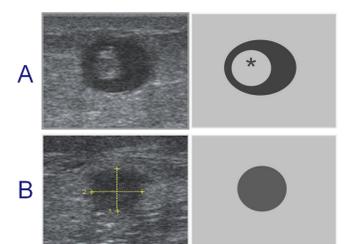


Fig. 6: Typical US patterns A) CS: discontinued pressure B) CFB: continuous pressure

None of the film-equipped patients (n = 75) had to skip or reduce sports, while 17/50 cases (34.0%) under compression stockings did. Comfort was rated by the patients 6.4 (A), 4.4 (B) and 9.3 (C) on a 10 degree scale from 1 = terrible to 10 = perfect/no perception.

group	mode	symptoms 14d		symptoms 28d		comfort
A	CFB+CS	1/50	2.0%	2/50	4.0%	6.4
B	CS alone	31/50	64.0%	33/50	66.0%	4.4
C	CFB alone	2/25	12.0%	4/25	16.0%	9.3

Tab. 1: Comparison of three compression modalities

Conclusions

The effect of CFB is much different from textile media due to continuity and adhesion forces. Compared to CS, CFB provides a faster and asymptomatic regression of foam-occluded superficial varicosities (Figs. 2 - 5). Using foam sclerotherapy with CFB seems to make phlebectomy redundant. The CFB is preferably used in combination with medical stockings, but also serves as a stand-alone solution for patients not tolerating textile compression media.

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Publication available 9/2015

