

Efficacy of Velcro Band Devices in Venous and Mixed Arterio-Venous Patients

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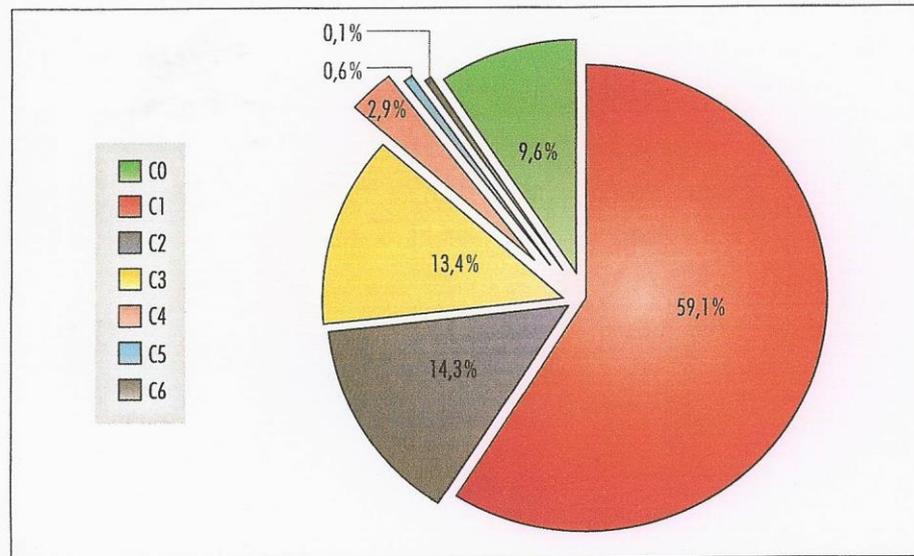
Chronic Ulceration

Differential Diagnosis

- * **Venous ulceration**
- * Ischemic ulceration
- * **Mixed ulceration**
- * Diabetic ulceration
- * Vasculitis
- * Neuropathy
- * Malignancy

Incidence of Leg Ulcer

Bonn Vein Study, n = 3.073



| | gesamt n (%) | Männer n (%) | Frauen n (%) |
|---|-----------------|-----------------|-----------------|
| C0: keine Zeichen einer venösen Veränderung | 294 (9,6) | 184 (13,6) | 110 (6,4) |
| C1: isolierte Teleangieektasien, retikuläre Venen | 1814 (59,0) | 789 (58,4) | 1025 (59,5) |
| C2: Varikose | 439 (14,3) | 167 (12,4) | 272 (15,8) |
| C3: eindrückbares prätibiales Ödem | 412 (13,4) | 156 (11,6) | 256 (14,9) |
| C4: Hautveränderungen | 88 (2,9) | 42 (3,1) | 46 (2,7) |
| C5: geheiltes venöses Unterschenkelgeschwür | 19 (0,6) | 8 (0,6) | 11 (0,6) |
| C6: aktives Unterschenkelgeschwür | 3 (0,1) | 2 (0,1) | 1 (0,1) |

Venous Hypertension

Main pathophysiologic principle

→ Ambulatory venous hypertension

Ambulatory Venous Hypertension

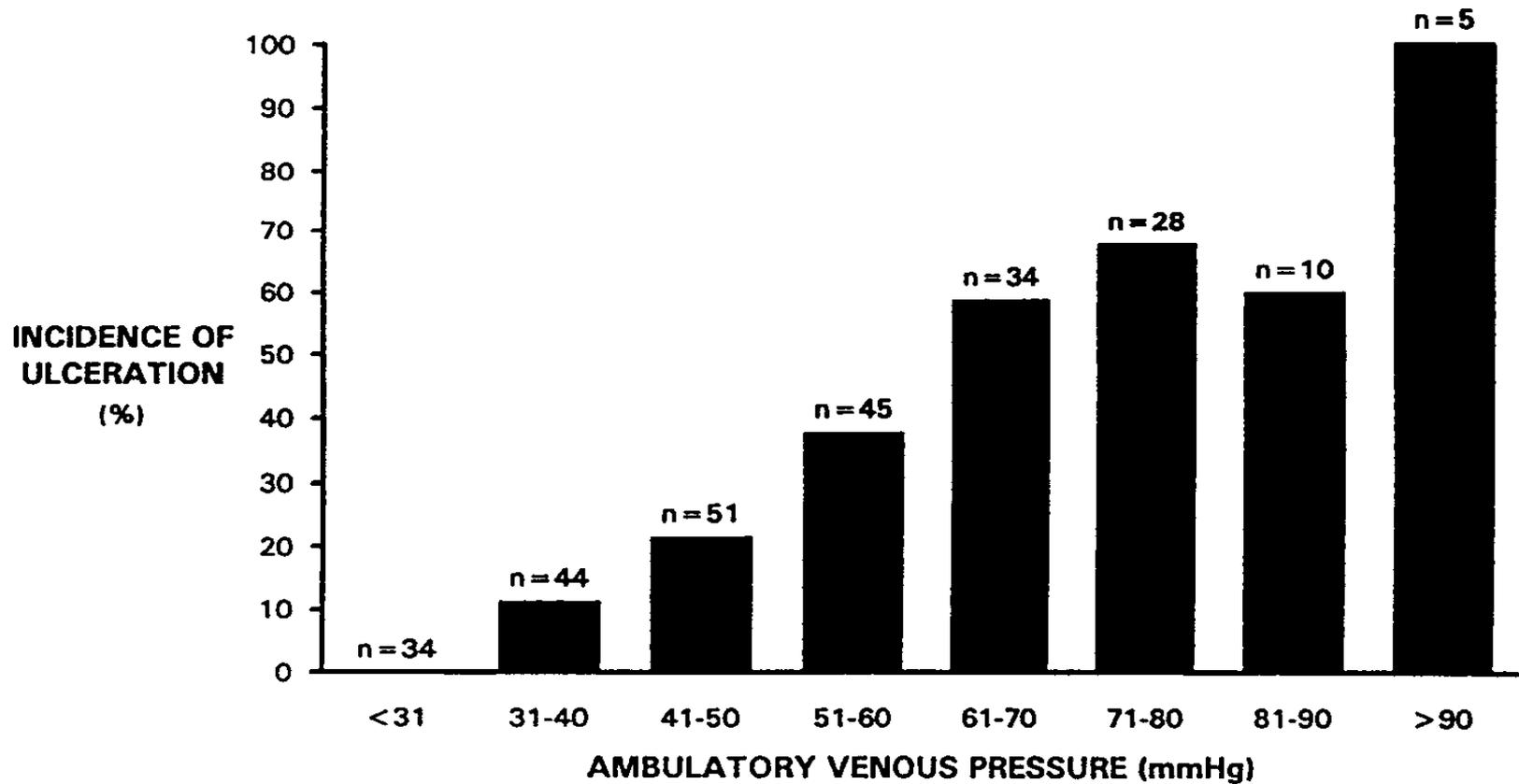


Fig. 1. Incidence of ulceration in relation to AVP.

Therapeutic Options in Chronic Venous Ulceration

- ⇒ **Conservative treatment including wound care**
- ⇒ **Operative treatment of superficial venous reflux**
- ⇒ **Surgery of ulceration**
- ⇒ **Reconstruction or recanalisation of deep venous system**
- ⇒ **Reconstruction of the arterial system in mixed ulcers**

Compression Tools

- Elastic fabrics and stockings
- Unelastic fabrics
- Adjunct materials

Compression Therapy

- Compression stockings are able to reduce venous ambulatory hypertension, even in patients with PTS**

Christopoulos DG et al.; Air plethysmography and the effect of elastic compression on venous haemodynamics in the leg
J Vasc Surg 1987; 5: 148-159

Improvement of Venous Hemodynamics under Compression Therapy

- Significant improvement of ambulatory venous hypertension
in varicose vein patients (n=22, -48%)
and in patients with deep vein
incompetence (n=9, -18%)
wearing compression stockings

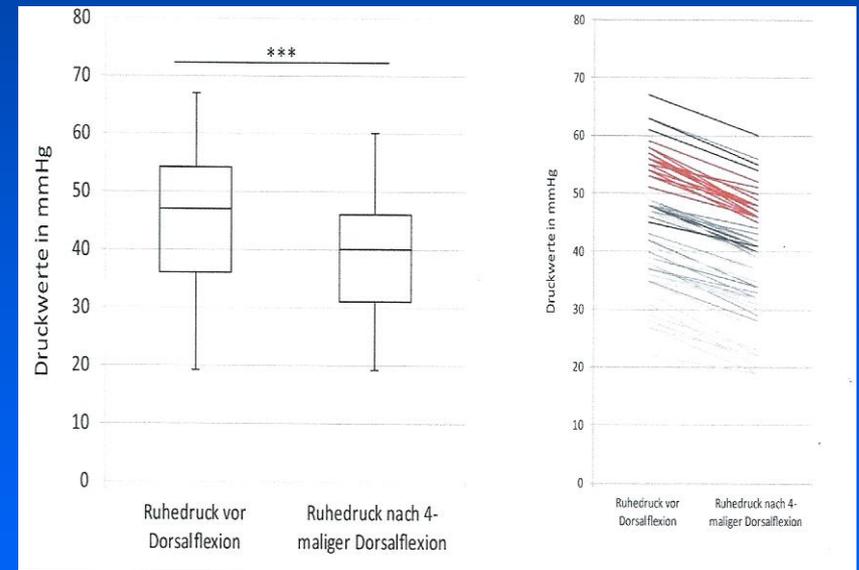
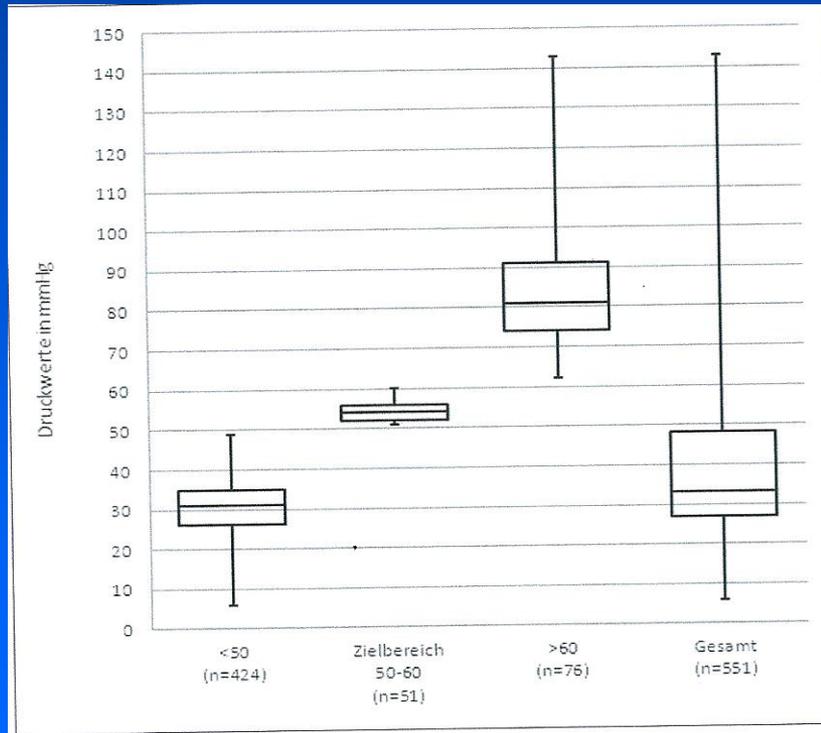
Fabrics for Compression

| Type | Elasticity | Fabric | Resting pressure | Working pressure |
|------------------------|----------------|---------------------------------------|------------------|------------------|
| Unelastic bandage | 0 | Unnas paste dressing Circaid | 1 | 4 |
| Adhesive bandage | ~ 60% | Super streched cotton | 1 | 4 |
| Short stretch bandage | Up to 60% | Super streched cotton and/or polyamid | 1-2 | 4 |
| Middle stretch bandage | Up to 140% | Polyurethan | 1-3 | 3-4 |
| Extra stretch bandage | More than 140% | Polyurethan or rubber | 2-3 | 2-3 |

Elasticity and pressure behavior of different fabrics

1=very low; 2=low; 3=middle; 4=intense

- Study in Germany with 891 care providers (3,3 % physicians, 5,5 % medical assistants, 90,7 % nursing staff) to test the knowlege and expertise in bandaging



Decrease of pressure after
one foot movement

Pressure after bandaging

- Conclusion: Clearly, compression material and its application are unfamiliar to most practice employees.
 - ▶ Without question there are deficits in the provision of compression therapy.

Compression and Ulceration

Cochrane Review with 48 RCT's including 4.321 patients with chronic ulceration

- Ulcer healing with compression faster than without
- Patients with 4-layer bandages showed faster healing than patients with short stretch bandages
- Ulcer healing rate higher with high pressure CS than with short stretch bandages



Inelastic compression

- self management / adherence
- rapid reduction of edema
- (re-)adjustable compression
- cost effectiveness

Clinical Case

- man 55 years old
- duplex examination: left GSV incompetence + incomplete recanalization of a previous femoro- popliteal DVT
- painful skin ulcer on the antero-lateral aspect of the left leg in the supra-malleolar area
- ulcer surface: 40 cm²
- ulcer duration 1 years
- treated with different wound dressings in a wound healing centre (dermatologist and nurses)
- compression therapy: elastic stocking exerting 23-32 mm Hg

Clinical Case

treatment:

- ✓ UGFS: not advisable
- ✓ foam dressing
- ✓ CircAid full stretched to exert more than 50 mm Hg

Data from Giovanni Mosti

Clinical Case



04.02.2015

Data from Giovanni Mosti

Clinical Case



Data from Giovanni Mosti

Clinical Case



28.06.2015

Data from Giovanni Mosti

Clinical Case



7 months and 17 days for the ulcer healing 21.09.2015

case series

- 20 patients (9 women; 11 men; age 56-82) affected by venous ulcers
- ulcer surface: 5-50 cm²
- ulcer duration: 6 months-1 year

- compression pressure applied at 50-60 mm Hg
- patients educated to re-adjust their compression pressure when looseness sensation occurred
- 17 out of 20 patients healed; 3 are improving
- 14 out of 17 healed within 3 months

Ehmann S¹, Whitaker JC², Hampton S³, Collarte A⁴

Multinational, pilot audit of a Velcro adjustable compression wrap system for venous and lymphatic conditions

J Wound Care. 2016 Sep; 25: 513-20

CONCLUSION:

Early results in this small audit demonstrate that this adjustable Velcro compression wrap may provide a **simple, clinically effective and patient-acceptable solution for self-care** with compression. Use of this type of device could have the **potential to reduce overall health-care burden by reducing necessary skilled treatment visits and/or cost while still achieving good clinical outcomes**. Further studies are required to confirm this pilot study and provide additional data.

Partsch B¹, Partsch H²

New aspects of compression therapy

Wien Med Wochenschr 2016; 166: 305-11

In this review article the mechanisms of action of compression therapy are summarized and a survey of materials is presented together with some practical advice how and when these different devices should be applied. Some new experimental findings regarding the optimal dosage (= compression pressure) concerning an improvement of venous hemodynamics and a reduction of oedema are discussed. **It is shown, that stiff, non-yielding material applied with adequate pressure provides hemodynamically superior effects compared to elastic material** and that relatively low pressures reduce oedema. Compression over the calf is more important to increase the calf pump function compared to graduated compression. **In patients with mixed, arterial-venous ulcers and an ABI over 0.6 inelastic bandages not exceeding a sub-bandage pressure of 40 mmHg may increase the arterial flow and improve venous pumping function.**

Mixed Ulceration

Important for healing in mixed ulceration is critical ischemia

Definition

- Pressure > 35 mm Hg is necessary for wound healing (Jünger, Dissemond, Passberg)
- Toe pressure should be > 30 mm Hg
- ABI > 0.49
- TcPO₂ > 40 mm Hg

Ruangsektakit C et al.: Transcutaneous oxygen perfusion: a useful predictor of ulcer healing in critical limb ischemia
J Wound Care 2010; 19: 202-206

- Study in 50 patients with ulceration or gangrene, ABI 0.75 ± 0.39
 - ▶ 13 (26%) TcPO₂ <20 mm Hg -> no healing
 - ▶ 15 (30%) TcPO₂ >40 mm Hg -> complete healing
 - ▶ 22 (44%) TcPO₂ 20-40 mm Hg
 - > 10 TcPO₂ decrease to >10 mm Hg at 30 degree elevation, complete healing in 8 patients
 - > 12 TcPO₂ decrease <10 mm Hg at 30 degree elevation, 11 patients no healing

Summary Mixed Ulceration

- Arterial reconstruction is not necessary in many cases with mixed ulceration
- Compression could be applied, if there is no critical ischemia
- In patients with mixed ulceration ischemia has to be evaluated very careful

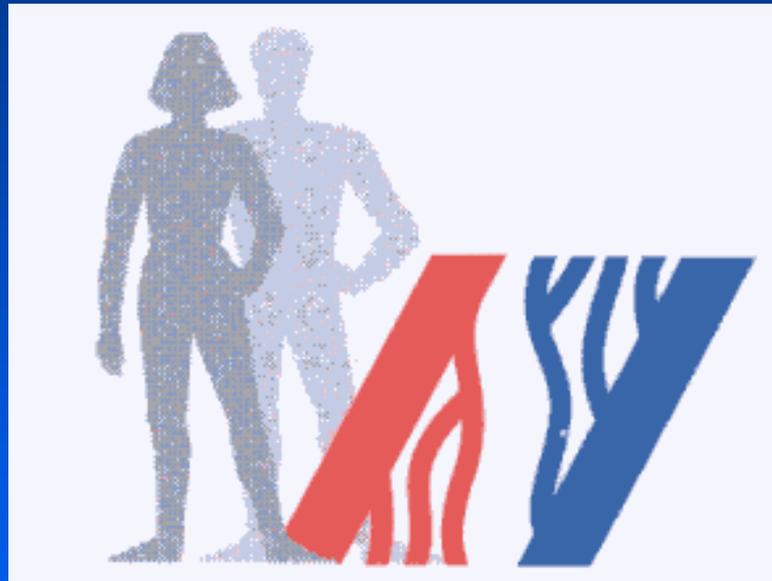
Summay

Important is a Master Plan for Treatment of Venous Leg
Ulceration

Causal and Symptomatic Therapy

- Compression, **unelastic fabrics are superior to short stretch bandages**
- Treatment of superficial venous reflux
- Surgery of ulceration
- Surgical or interventional treatment of deep venous reflux or obstruction in postthrombotic patients

Thank You Very Much for Your
Attention



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