compression in post varices treatment inflammation

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disclosure

- accomodation paid by MEDI
- no influence on the presentation

vein procedures and inflammation: surgery

tissue manipulation and dissection during surgery may trigger local and systemic inflammatory responses, which are often proportional to the extent of tissue injury.

a systemic cytokine “storm”, basically Interleukin-6,-8,-10, TNFα is a common observation after surgery.

circulating levels of several proinflammatory cytokines are significantly up-regulated in the hours and days following surgical intervention.

vein procedures and inflammation: e.v. procedures

the inflammatory process that accompanies thermal and chemical ablation has not been clearly elucidated, but there is a body of evidence to suggest that this inflammation is involved in the ablation process

inflammation is a very well know collateral effect of sclero-therapy due to vein wall cells disruption

compression and varicose vein procedures: why

compression is effective in inflammation control

- prevents release of mediators involved in the local inflammatory response
- increase the production of anti-inflammatory mediators

in particular compression therapy:

1. reduces the high levels of pro-inflammatory cytokine including MMP1,2,3, 8, and 9 TNFα
2. increases the levels of the anti-inflammatory cytokine IL-1 Ra

Murphy MA et al. Eur J Endovasc Surg 2002; 23: 349-52.
Beidler SK et al. J Vasc Surg. 2009 ;49:1013-20
Beidler SK et al. Wound Repair Regen. 2008 ;16:642-8

compression and varicose vein procedures: why

compression is effective not only in inflammation prevention

compress the vein or the vein track (for surgical procedures):
→less thrombus formation; higher occlusion rate

compress all the leg veins:
→less DVT and phlebitis

compress of the surrounding tissue:
→less hematoma, less inflammation, less pain and pigmentation

compression and varicose vein procedures

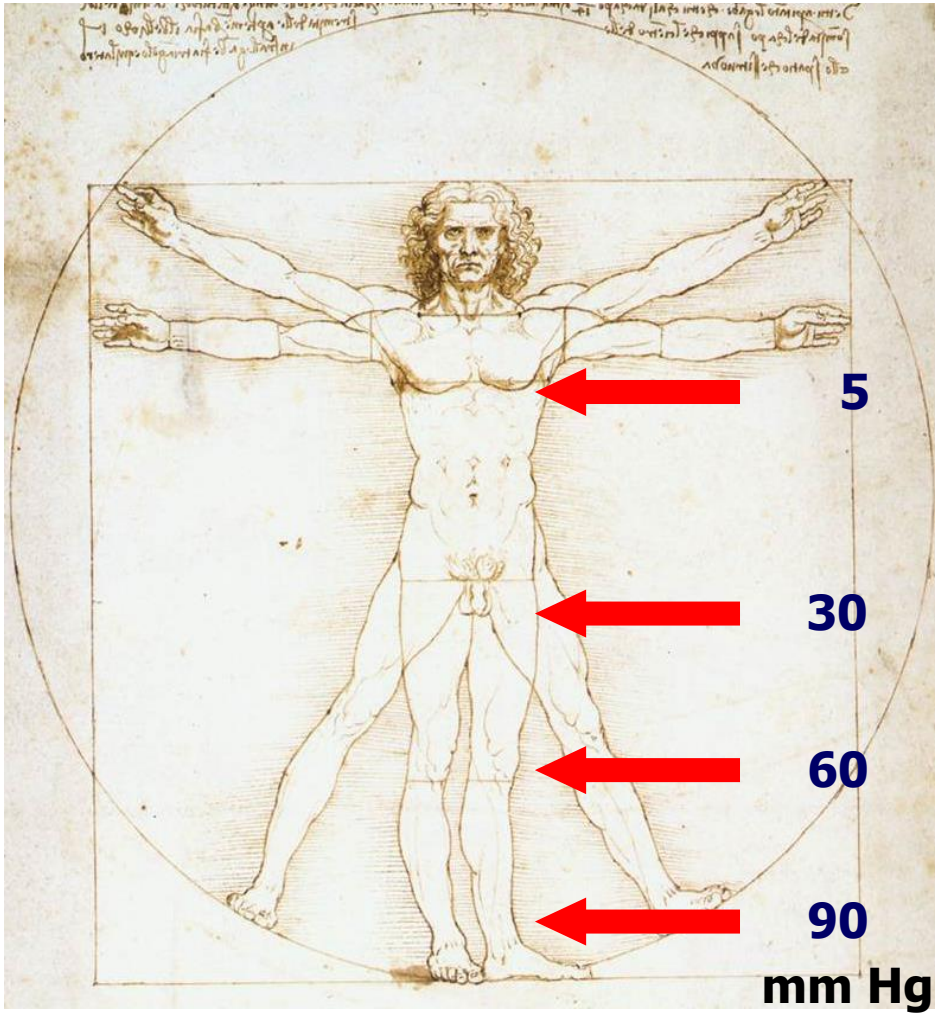
compression is effective not only in inflammation prevention

compression therapy is effective in:

- reduction of hematoma and edema
- reduction of inflammation and pain
- improvement of results (occlusion)
- reduction of phlebitis and DVT
- reduction of recurrence through reduction of neovascularization*

*Munasinghe A, Smith C, Kianifard B, et al. Br J Surg. 2007 Jul;94(7):840-3
*Creton D. Phlebologie 2008;37:134-41

compression and varicose vein procedures: how



To exert these effects compression must compress the veins: a strong pressure of 30→ 60 mm Hg is necessary to compress the veins at thigh level

compression and varicose vein procedures: evidences

- **Methods:** Systematic review of MEDLINE, Embase and CENTRAL to identify RCTs investigating different post-procedures compression strategies
- **Results:** 7 RCTs (open surgery 3 RCTs, foam sclerotherapy 2 RCTs, EVLA 2 RCTs)
  - Quality was variable, significant sources of potential bias. Both the studies and compression regimens used were heterogeneous.
  - Ten products were used in six general regimens for a duration of 0-42 days.

CONCLUSION: There is currently little quality evidence upon which to base any recommendations concerning compression following treatment for varicose veins

El-Sheika et al. Br J Surg. 2015 Jun;102(7):719-25

compression and varicose vein procedures: evidences

34 randomized clinical trials.

- 14 different compression products were used,
- with at least 6 different pressures
- in 7 different regimes
- with durations from 2 to 84 days.

There was no evidence of any convergence of practice over time.

Conclusions: A lack of evidence as to the optimal strategy for compression. Further research is required.

El-Sheika et al. Phlebology. 2017 May;32(4):256-271

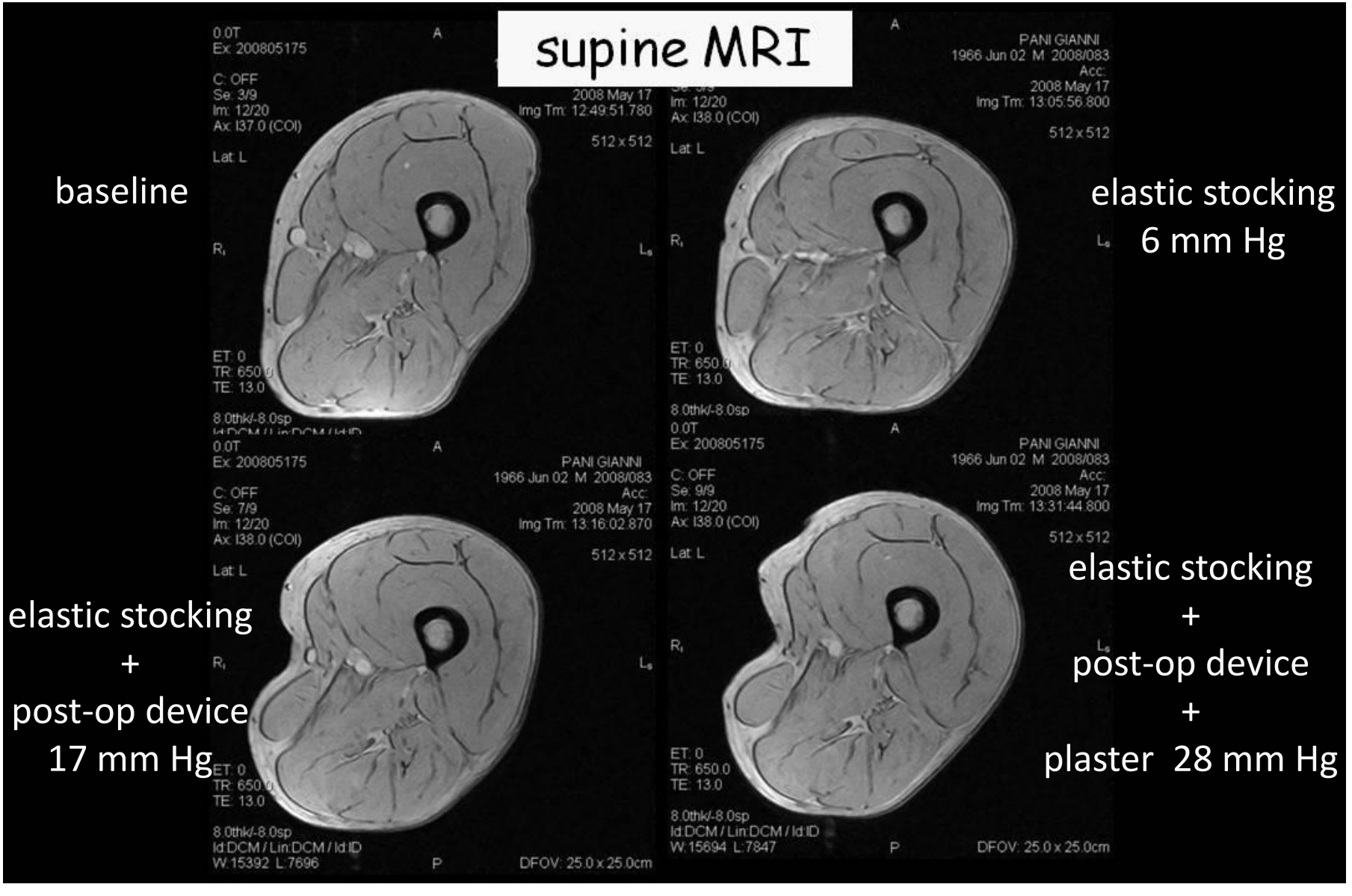
post procedures compression therapy

we have papers reporting everything and its opposite:

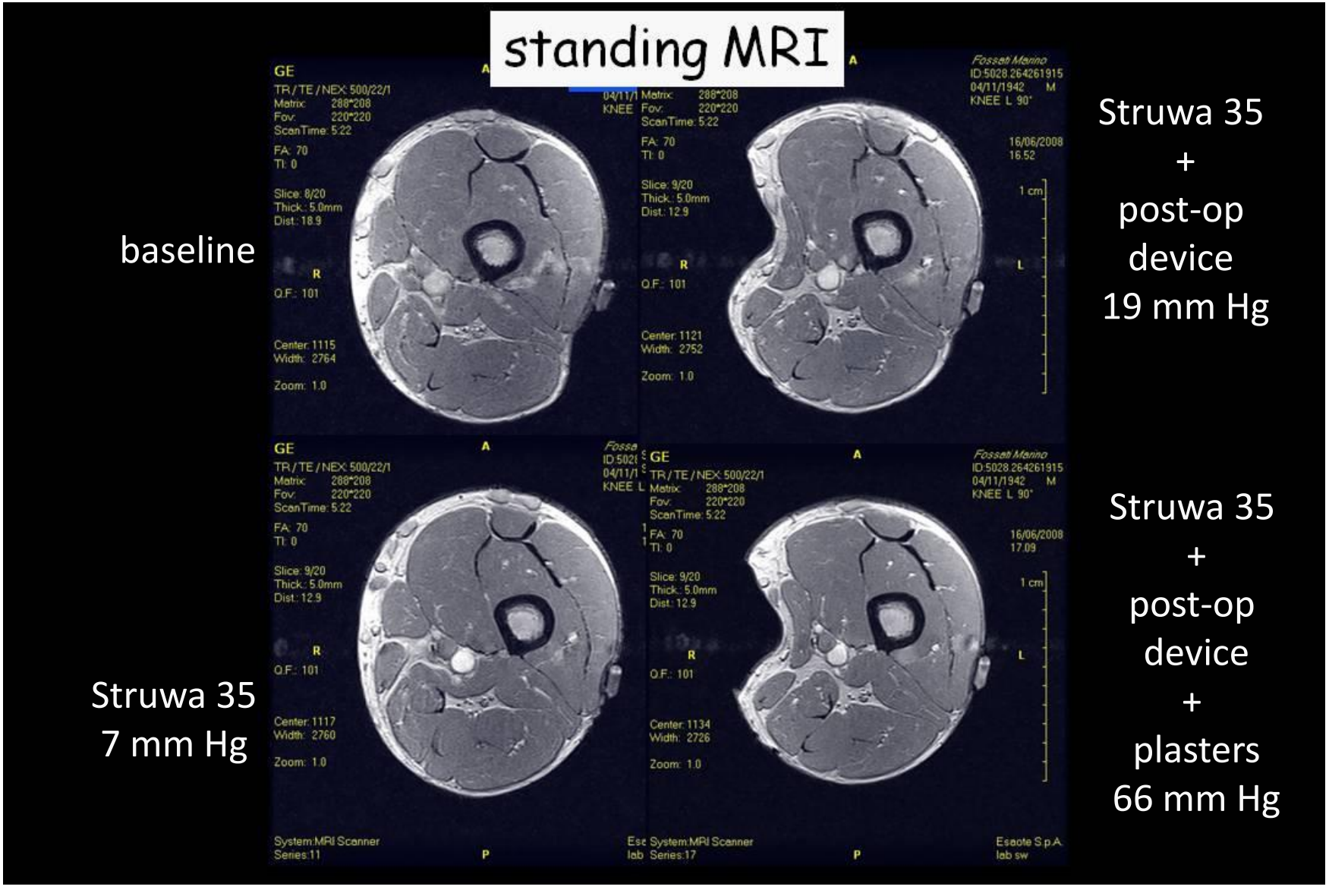
- strong compression better than mild compression
- mild compression better than strong compression
- with new procedures: no difference between compression and no compression

one of the more important point in favour of no compression or low compression is that intrafascial veins cannot compressed anyway

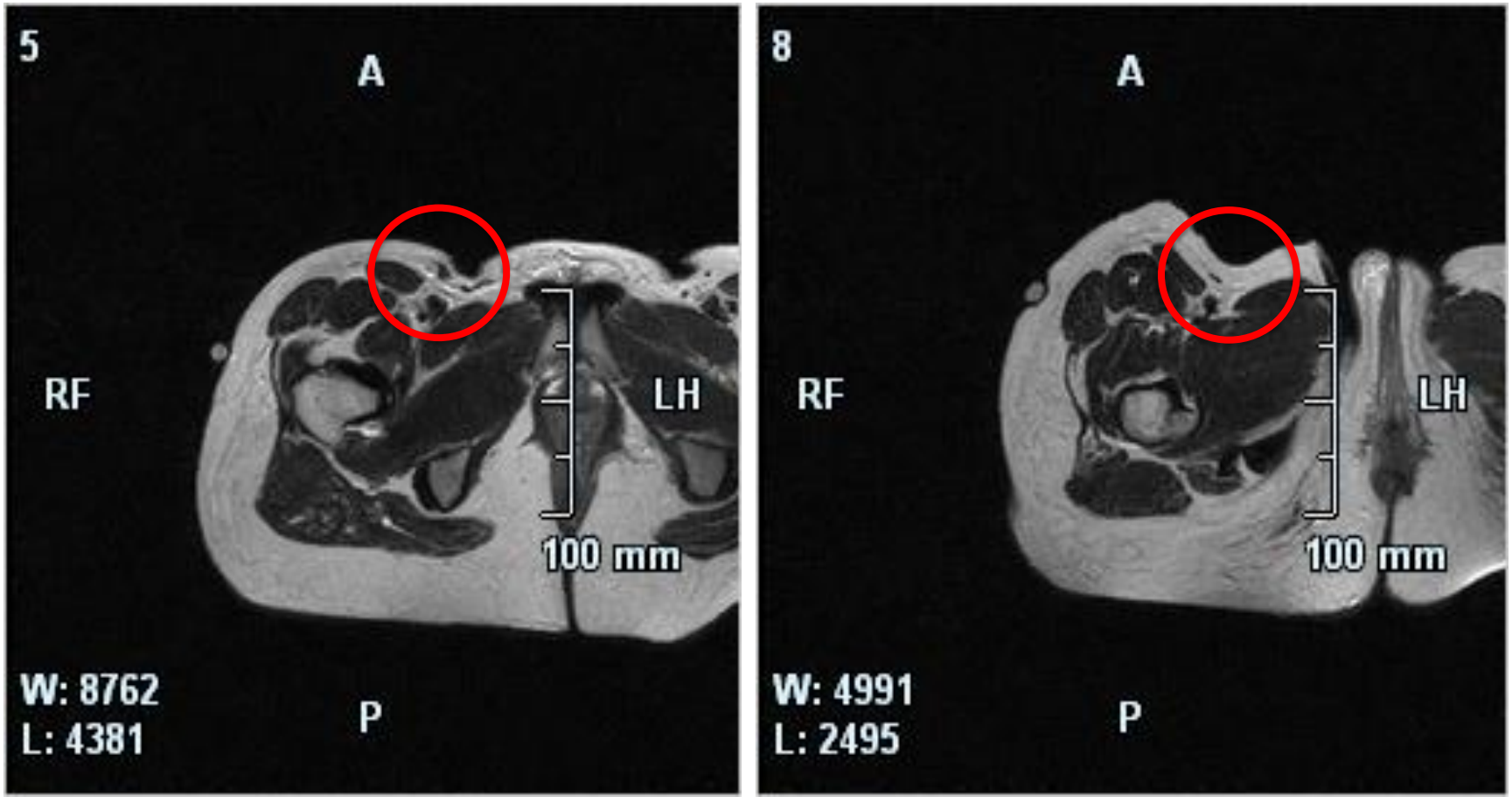
intrafascial veins can be compressed



intrafascial veins can be compressed



intrafascial veins can be compressed



Partsch H, Mosti G, Mosti F. Int Angiol. 2010 Oct;29(5):408-10.

in favor of strong compression

after flush ligation and stripping, when compression pressure is measured, strong compression is more effective than mild compression in reducing:

bleeding, pain, hematoma formation

no differences in SVT or DVT occurrence

Travers JP, Rhodes JE. Ann Roy Coll Surg Eng 1993; 75: 119–122
Benigni JP, Allaert FA et al. Perspect Vasc Surg Endovasc Ther. 2011 Dec;23(4):238-43.
Mosti G, Mattaliano V et al. Int Angiol. 2009 Aug;28(4):274-80.

in favor of strong compression

to compare the clinical outcome after surgery on GSV (10.5 ± 2.9 mm 10 cm below the junction) we compressed the thigh using:

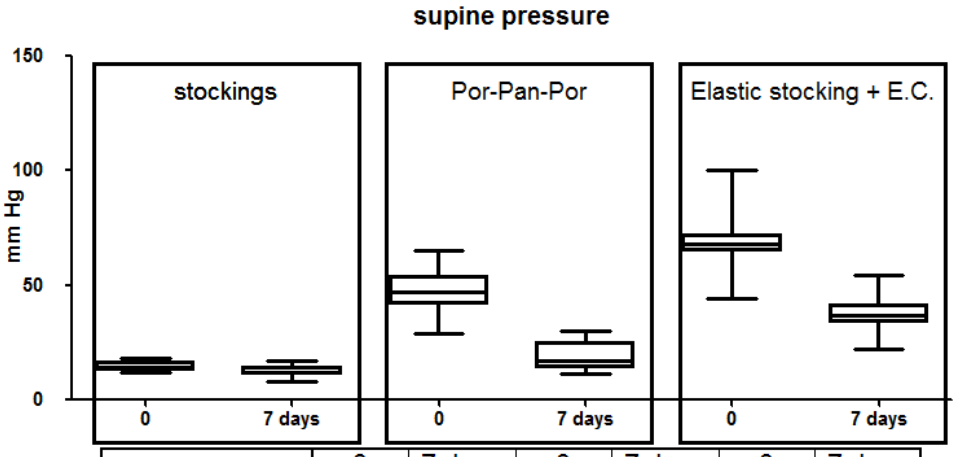
- A: thigh length MCS (23-32 mm Hg)
- B: adhesive bandage (Porelast-Panelast)
- C: MCS + eccentric device with tapes

all patients had venous surgery: invagination stripping + side-branches evulsion

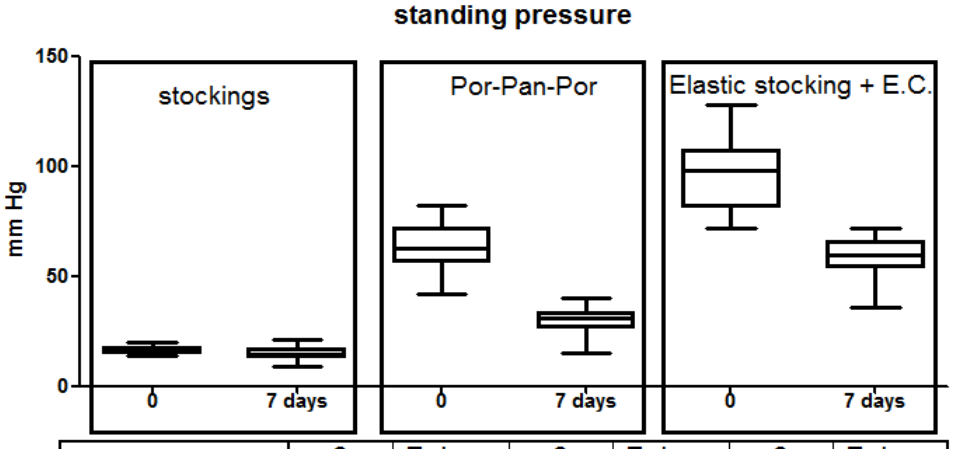
Mosti G et al. Int Angiol. 2009 Aug;28(4):274-80.

in favor of strong compression

interface pressure



	0	7 days	0	7 days	0	7 days
Minimum	12.00	8.000	29.00	11.00	44.00	22.00
25% Percentile	13.00	11.00	41.75	13.75	64.75	33.75
Median	14.00	12.00	47.00	17.00	68.00	36.50
75% Percentile	16.00	14.00	53.50	25.00	72.00	41.00
Maximum	18.00	17.00	65.00	30.00	100.0	54.00



	0	7 days	0	7 days	0	7 days
Minimum	14.00	9.000	42.00	15.00	72.00	36.00
25% Percentile	15.00	13.00	56.50	26.50	81.75	54.25
Median	16.00	14.50	63.00	31.00	98.00	59.50
75% Percentile	17.25	17.00	72.00	33.25	107.5	66.00
Maximum	20.00	21.00	82.00	40.00	128.0	72.00

clinical outcomes

major adverse events	stocking	Por-Pan	pad+ stocking
pain (VAS>6)	7	1	0
extensive haematoma	2	0	0
bleeding through bandage	1	0	0
superficial /deep vein thrombosis	0	0	0
total	10	1	0

minor adverse events	stocking	Por-Pan	pad + stocking
pain (VAS 2-6)	4	0	0
discomfort	1	1	0
skin irritation , blisters	0	2	12
clot in stripping track	1	0	0
total	6	3	12

high local pressure reduces pain and hematoma

EVLA: in favor of strong compression

after Laser ablation (940 nm, bare fiber) of great saphenous vein 200 patients were randomised to elastic compression on top of a cotton roll fixed to the skin along the saphenous track (group A) or elastic compression alone (group B)

pressure not measured but certainly higher in the second group

Lugli M. et al. Phlebology. 2009 Aug;24(4):151-6

in favor of strong compression

Lugli M. et al. Phlebology. 2009 Aug;24(4):151-6

in favor of strong compression

after 7-day patients were assessed for level of pain

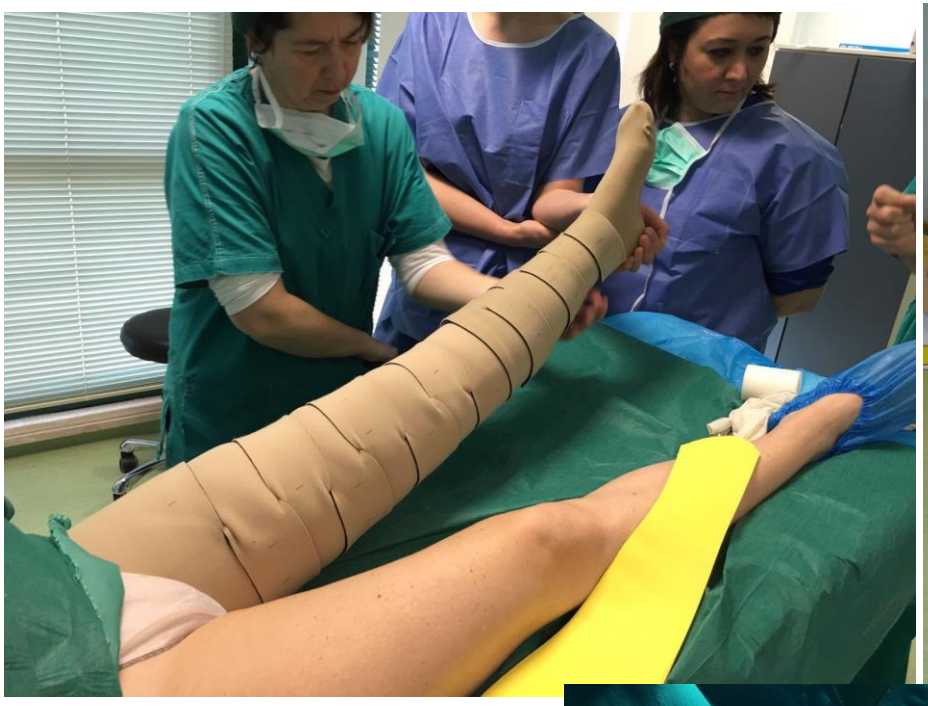
pain intensity was measured using a VAS giving a numerical grade from 0 (no pain) to 10 (worst pain)

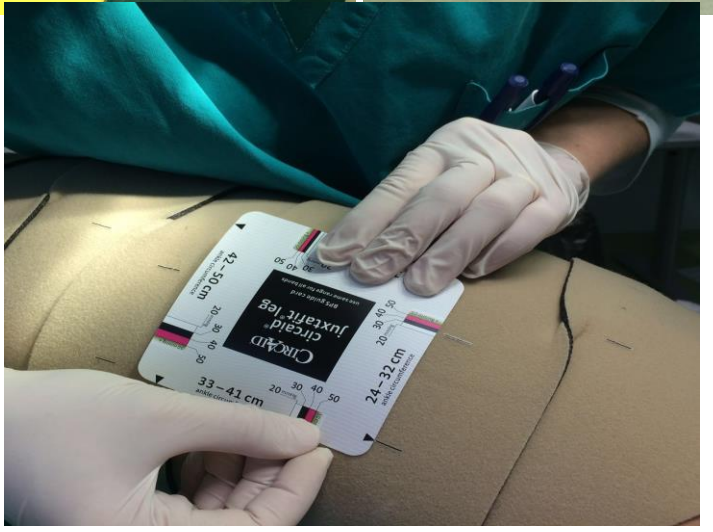
group A	group B	
1.4 ± 1.6 [1–8]	4.9 ± 1.6 [0–8]	P<0.001

Lugli M. et al. Phlebology. 2009 Aug;24(4):151-6

in favor of strong compression

strong compression





50 mm Hg

courtesy by A. Cavezzi

in favor of light compression

no difference between strong and light elastic stocking:

even stocking exerting a strong compression pressure at ankle level exert not more than 10-15 mm Hg at thigh level which is not enough to compress thigh veins

almost nothing vs nothing was compared

bruising and thrombophlebitis are not the best outcomes to differentiate between different compression modalities

Shouler PJ, Runchman PC. Ann Roy Coll Surg Eng. 1989; 71: 402–04.

in favor of light compression

no difference between bandages and elastic stockings:

no information on used materials, exerted pressure, skillness of “bandagers”, bandage slippage or rolling, side effects were reported

maybe good elastic stockings were compared with poorly applied bandages

Scurr JH, Coleridge-Smith P et al. Ann R Coll Surg Engl. 1985 Mar;67(2):109-11.
Bond R, Whyman M et al. Phlebology.1999; 14: 9–11.
Mariani F, Marone EM et al. J Vasc Surg. 2011 Jan;53(1):115-22.

in favor of light compression

100 patients with telangiectasias and reticular veins, treated with a single session of standardized liquid sclerotherapy were randomized to wear medical compression stockings (23 to 32 mm Hg) daily for 3 weeks or no such treatment.

Kern P et al. J Vasc Surg. 2007 Jun;45(6):1212-6.

compression and no compression: all the same

Pittaluga: compression useless after ASVAL

- small side branches avulsion under local tumescent anesthesia
- elastic stocking exerting 18 mm Hg at ankle level (<10 at thigh level) prescribed for 1 day
- one group kept on with compression for 7 days
- one group removed compression after the 1st day

nothing vs nothing was compared

Pittaluga P, Chastanet S. Proceedings of EVF Annual Meeting. Liubljana 2011.

EVLA: compression and no compression: all the same

Maurins: compression is useless

- 1470 nm diode Laser and 2 rings fiber
- no data on vein diameter
- no treatment of tributaries
- elastic stocking exerting 23-32 mm Hg prescribed:
  - ✓ only during the day for one week
  - ✓ during the day for four weeks
  - ✓ no compression
- symptoms evaluation after 28 days showing no difference

Maurins U, Rits , et al. Poceedings of German Society of Phlebology. Annual Meeting. Lubeck 2012.

EVLA: compression and no compression: all the same

Maurins: compression is useless

Comments:

- no data in the first 7 days
- compression at thigh level about 10 mm Hg and only during the day: is this compression therapy?
- or, once again, nothing vs nothing was compared?

Maurins U, Rits , et al. Poceedings of German Society of Phlebology. Annual Meeting. Lubeck 2012.

foam sclerotherapy: compression and no compression: all the same

prospective open randomized controlled trial conducted in two centers.
60 patients with incompetent GSV or SSV underwent ultrasound-guided foam sclerotherapy. No treatment of tributaries.

randomization: one group with compression stockings 15-20 mmHg worn during the day, for 3 weeks; one group without compression (WCG) .

efficacy of sclerotherapy and all of the side effects were assessed, including side effects in the treated region

Hamel-Desnos CM et al. Foam Sclerotherapy of the Saphenous Veins: Randomized Controlled Trial with or without Compression. Eur J Vasc Endovasc Surg. 2010 Apr;39(4):500-7

foam sclerotherapy: compression and no compression: all the same

Aetoxisclerol® 1% was used in 90%; 2% in 10% of cases

on average 4 ml of foam was used for the GSV and 3.6 ml for the SSV (range 2.5e7.5 ml)

the saphenous vein occlusion rate was 100% in both groups

Hamel-Desnos CM et al. Foam Sclerotherapy of the Saphenous Veins: Randomized Controlled Trial with or without Compression. Eur J Vasc Endovasc Surg. 2010 Apr;39(4):500-7

foam sclerotherapy: compression and no compression: all the same

mean number of days for which elastic compression was worn: 11 out of 21 days.

only 40% of patients wore compression stockings every day.

compliance with compression (and its assessment) is a limitation of this treatment.

compression did not demonstrate the expected superiority in the following areas: thrombophlebitis, inflammation, pain, pigmentation and matting.

Hamel-Desnos CM et al. Foam Sclerotherapy of the Saphenous Veins: Randomized Controlled Trial with or without Compression. Eur J Vasc Endovasc Surg. 2010 Apr;39(4):500-7

compression after vein procedures

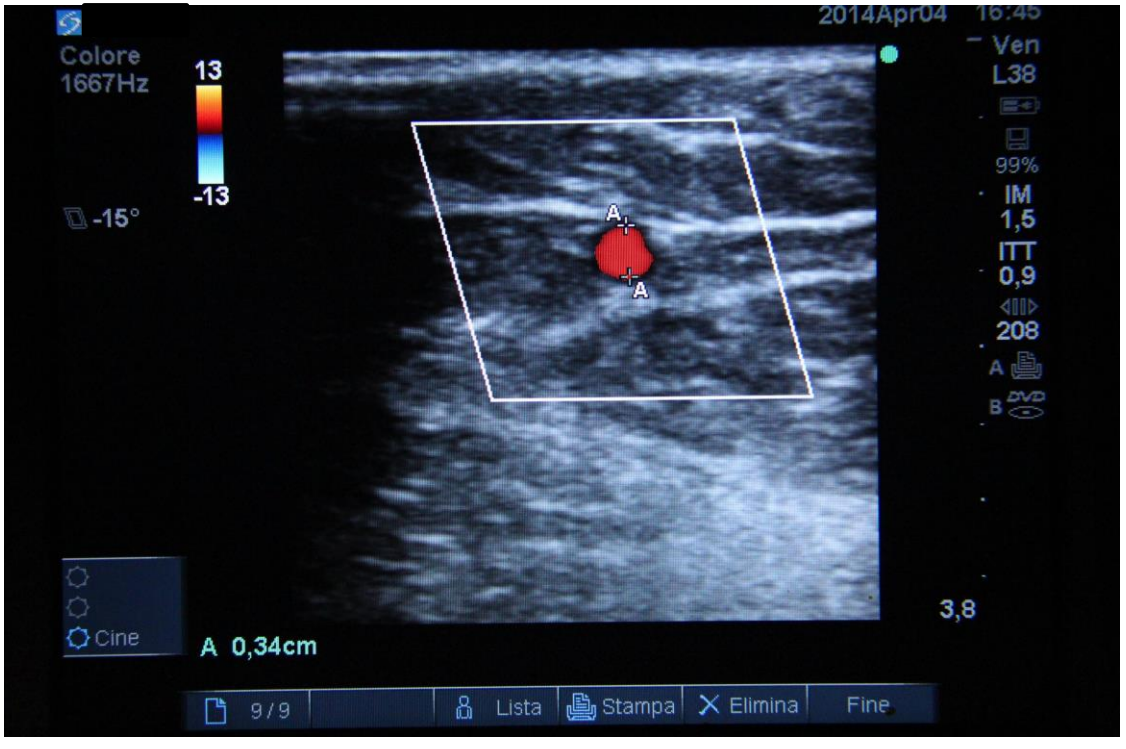
conclusion: extremely confusing topic

in published papers some very important influencing items are not considered

1. different veins
2. different procedures
3. different patients
4. different surgeons

different veins

different veins



influencing items

1. different veins
2. different procedures
3. different patients
4. different surgeons

different procedures

more prone to produce hematoma, pain and inflammation:

- flush ligation, stripping and phlebectomies
- foam sclerotherapy of trunk and varices, high concentration, high volumes
- old lasers machines

different procedures

less prone to produce hematoma, pain and inflammation:

- small branches avulsion
- sclerotherapy without tributaries treatment, low concentration, low volumes
- radiofrequency
- new laser devices

influencing items

1. different veins
2. different procedure
3. different patients
4. different surgeons

different patients

more or less tolerant
more or less demanding
more or less compliant

influencing items

1. different veins
2. different procedure
3. different patients
4. different surgeons

different surgeons

V.I.S.

different surgeons

Zorro Surgeons

conclusions

EVIDENCES

1. compressing thigh veins is possible

2. when measured, a strong compression pressure in standing position is more effective than low compression in preventing inflammation and other unwanted effects after vein surgery (high ligation and stripping) or EVLA of previous generation

conclusions

not evidences but suggestions

large veins
by traditional surgery
by old Lasers machines
by foam sclerotherapy using high volumes and high concentration
especially <u>when performing phlebectomies</u>:

→ strong compression by inelastic bandages, EC plus stockings, ACW

conclusions

not evidences but suggestions

small veins
by new Lasers machines
by foam sclerotherapy at low volumes and low concentration or glue
no phlebectomies
→ low compression is maybe enough

actic jar 500 b.C.

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