

Compression therapy following ambulatory phlebectomy

A prospective study

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Keywords

Varicose veins, ambulatory phlebectomy, compression therapy

Summary

Aim: The study was designed to evaluate the feasibility, results and safety of a very short period of compression after ambulatory phlebectomy. **Patients, methods:** From September to December 2006 we prospectively studied 49 subsequent patients who underwent ambulatory phlebectomy for branch varicose veins. Post-operatively the treated part of the leg was bandaged for forty-eight hours. **Results:** No major adverse events occurred. Although 46.9% of treated patients had visible haematomas two days post-operatively, after six weeks this was only visible in one patient. The results of this study show that the clinical outcome of ambulatory phlebectomy in combination with compression for forty-eight hours is at least equal to a conventional (longer) period of compression. **Conclusion:** Post-operative treatment can be safely reduced without the need of adjuvant compression hosiery. This will reduce patient discomfort after ambulatory phlebectomy without jeopardizing the clinical outcome.

Schlüsselwörter

Varizen, ambulante Phlebektomie, Kompressionstherapie

Zusammenfassung

Ziel: Die Studie wurde entworfen, um die für kurze Zeit angebrachte Kompressionstherapie mittels Haftklebeverband auf Ausführbarkeit, Resultat und Sicherheit zu testen. **Patienten, Methoden:** Von September bis Dezember 2006 wurden 49 aufeinanderfolgende Patienten untersucht, deren Varizen mit den Muller-Haken entfernt wurden. Direkt nach dem Eingriff wurde jeweils nur der behandelte Abschnitt des Beines mit Haftklebeverband verbunden. **Ergebnisse:** Es gab keine größeren Nebenwirkungen. Obwohl 46,9% der behandelten Patienten nach zwei Tagen sichtbare Hämatome hatten, reduzierte sich die Anzahl nach sechs Wochen auf einen einzigen Patienten. Die Resultate dieser Studie zeigen, dass das klinische Resultat der ambulanten Phlebektomie in Kombination mit einer anschließenden Kompressionsdauer von achtundvierzig Stunden zumindestens vergleichbare Resultate zeigt im Vergleich mit der konventionellen (längeren) Kompressionsperiode. **Schlussfolgerung:** Die post-operative Behandlung kann deshalb sicherlich verkürzt werden mit dem Vorteil einer ebenfalls verkürzten Kompressionstherapie. Dies bedeutet eine Verbesserung der Behandlung im Sinne der Patientenakzeptanz ohne Beeinträchtigung des therapeutischen Resultats.

Kompressionstherapie nach ambulanter Phlebektomie

Eine prospektive Studie

Mots clés

Varices variqueuses, phlébectomie ambulatoire, compression

Résumé

Le **but** de cette étude est d'évaluer l'efficacité, les résultats et la sécurité d'une compression d'une courte durée après une phlébectomie ambulatoire. **Patients, matériel:** Depuis le mois de septembre 2006 jusqu'au mois de décembre 2006, cette étude unicentrique et prospective auprès de 49 patients opérés par phlébectomie pour traiter des varices variqueuses collatérales, a eu l'objectif d'observer l'effet d'une compression postopératoire de 48 heures. **Résultat:** Il n'a pas été enregistré d'effets indésirables majeurs. Après le traitement par compression de 48 heures, 46,9 % des patients ont présenté des hématomes. Après un suivi de 6 semaines, il n'y avait plus qu'un seul patient à présenter un hématome. Les résultats de cette étude démontrent que le résultat postopératoire après une compression de 48 heures est au moins comparable au résultat que l'on obtient après une compression de plus d'une semaine, laquelle se situe dans la moyenne des durées normales. En **conclusion**, la réduction de la durée de la compression après une phlébectomie s'avère être une opération sûre et n'entraîne pas de risques supplémentaires. Ainsi, cette compression de 48 heures garantira une satisfaction de haut niveau auprès des patients et un maintien du niveau de la qualité du résultat clinique.

Compression après une phlébectomie ambulatoire

Une étude prospective

Phlebologie 2008; 37: 3–6

Ambulatory phlebectomy (AP) is regarded an effective elegant and minimal invasive technique for the removal of varicose veins. It can be performed in an outpatient setting with minimal down-time for the patient. We recently proved AP to be significantly more effective than sclerotherapy for tributary varicose veins (13). When reviewing the literature on

post-operative care after AP however, we could not find consensus on the duration of post-operative compression. Moreover, literature on compression after AP is scarce (7, 11). There are currently no prospective studies that directly address this subject.

The above mentioned studies as well as textbooks on this subject (9, 10) advocate the use of a prolonged period of compres-

sion of up to three months. This compression is being used to avoid haemorrhaging and haematoma formation and is being carried out by a combination of bandages and compression hosiery (class I or II). If only the treated area is bandaged additional compression hosiery is worn to avoid oedema in the distal part of the treated leg.

When compression stockings are worn the pressures that can be achieved on the thigh are relatively low. When compression bandages are used the initial pressures achieved can occlude the deep venous system. These pressures nevertheless drop rapidly within the first half hour after the bandages have been applied (4). Therefore, the risk of strangulation and subsequent thrombosis is virtually non-existent (3). In one of our previous studies we have indicated that – in theory – a much shorter period of compression should be feasible (7).

The first two days after a wound is made are considered to be the most important. At day one as blood constituents enter the wound space platelet aggregation and blood coagulation proceed rapidly. A stranding fibrin network is formed within the blood cloth which becomes cross-linked. Around day two polymorphonuclear leukocytes migrate into the wound and start to phagocytose wound debris. A day later these cells will have been substituted by macrophages which produce many growth factors. Therefore the essential period of wound healing and thrombus formation is within the first 48 hours. We wanted to verify our hypothesis that this short period of compression can be safely applied after AP without compromising the outcome or increasing the risk of adverse events.

Patients, methods

For this study only patients with accessory varicose veins were eligible to participate. These veins are:

- the lateral and medial accessory vein on the thigh as well as
- the anterior and posterior lateral vein or
- arcuate vein on the lower leg.

As a rule in our clinic patients with branch varicose veins are treated with ambulatory phlebectomy because of the results of our earlier study (13). Between September and December 2006 patients with branch varicose veins were invited to participate in this study. All patients underwent ultrasound investigation (Picus Pro, Esaote S.p.A. Geneva, Switzerland) with a 5– to 10-MHz trans-

ducer to exclude long and short saphenous vein insufficiency (CEAP classification: C2 Ep A5 Pr). The average length of the varicose vein was estimated at 35 cm. Only those patients that met the exclusion and inclusion criteria (Tab. 1) were included in the study. Patients were informed about the outlines and intentions of this study and consented to participate. A total of 49 patients were included in the study.

Ambulatory phlebectomy

When performing ambulatory phlebectomy (AP) the varicose vein is first marked with the patient in an upright position. The patient takes place on the operating table which is then put into Trendelenburg position. This is to reduce the pressure in the varicose vein and to minimize blood loss during the operation. In supine position the skin is then infiltrated with 1% prilocain with epinephrine (1 : 80 000). Parallel to the markings several 2 mm stab incisions are made through which the vein is grasped using a phlebectomy hook. For this study only Oesch phlebectomy hooks (Salzmann,

Sankt Gallen, Switzerland) were used. The vein is then fixed with artery clamps and extracted until part of the varicose vein is either extracted or ruptured. This procedure is repeated until the vein is extracted completely. The amount of vein extracted is estimated (<50%, 50–75%, >75%, 100%) and recorded.

The skin is then cleaned with a chlorhexidine containing disinfectant (chlorhexidine 0.5% in alcohol 70%) and after the skin is dried up the incisions are closed by surgical tape only. To prevent post-operative hemorrhaging bandages are applied for a period of 48 hours. We use a 7-cm broad foam compression pad (Kompres; Lohman, Neuwied, Germany). Secondly, a firm compression bandage (adhesive, 10-cm broad adhesive bandage; Pan-Elast, Lohman, Germany) is applied only over the treated area. This bandaging method has been extensively described in 1998 (7). For this study however no additional hosiery was used. Patients were instructed to contact the clinic in case of any unforeseen adverse events or questions regarding their treatment. Furthermore patients were instructed to walk for at least thirty minutes after the surgery. Also, they were advised to resume their daily activities directly after the phlebectomy.

Tab. 1 Inclusion and exclusion criteria

inclusion	<ul style="list-style-type: none"> ● patients older than 18 years ● not previously treated branch varicosis
exclusion	<ul style="list-style-type: none"> ● deep venous insufficiency ● relevant haemodynamic post-thrombotic syndrome ● large or small saphenous vein insufficiency ● pregnancy ● myocardial decompensation ● hypercoagulable state ● other serious illness ● dependency oedema ● allergic reaction to 1. lidocain, 2. bandage ● arterial disease

Tab. 2 Estimated amount of varicose vein harvested during the procedure

%	100	>75	50–75	<50
number	20	23	3	3
percentage	41	47	6	6

Follow-up

All patients returned to the clinic two days after the operation for removal of the bandages. The parameters that were scored were: blister formation, haematoma, haemorrhage, phlebitis, necrosis, dysaesthesia, teleangiectatic matting, scar-formation, oedema, as well as adverse effects caused by bandages. Patients were checked again after six weeks for residual varicose veins as well as the parameters mentioned above.

Results

A total of 49 patients were included in this study: 36 women (71.4%) and 14 men. Mean age was a little under 48 years (47 years and 354 days); the eldest patient was

81 years and two months the youngest 25 years and ten months. No patients were lost to follow up. No major adverse events such as haemorrhages or post-operative bleeding occurred during the study period. The average amount of varicose vein that was harvested was 84.2% (Tab. 2). At week six no residual varicose veins were visible at the treated area. All patients were satisfied with the results and indicated that they would choose this treatment again if necessary. Furthermore all patients had been able to resume their daily activities immediately after surgery.

Outcome parameters

The parameters that were scored are listed in Table 3 in decreasing frequency. The most frequently observed complication was a haematoma. This occurred in 23 patients (46.9%) and was still visible in one patient (2.0%) after six weeks. Four patients (8.2%) who had been treated for branch varicose veins of the thigh showed pitting oedema on their lower leg at day two which resolved without additional compression. In three patients (6.1%) some blister formation was observed at the site where the surgical tape had been in place. Only antibiotic cream was prescribed to treat this condition. A further three patients had hyperpigmentation and skin discoloration around the treated area. In two patients (4.1%) a palpable subcutaneous nodule was present which was scored as a bloodclot. There were no patients with teleangiectatic matting, dysesthesia, necrosis or excessive scar tissue formation.

In addition to the complications described, one patient complained of severe itching soon after the operation. This turned out to be a patient suffering from, previously undisclosed, pressure urticaria. One patient returned to our clinic after several weeks presenting with a pseudolymphatic cyst, which responded excellently to aspiration of the fluid, and thus establishing the diagnosis. Compression hosiery was continued for some weeks.

Tab. 3
Complications two days
and six weeks after ambu-
latory phlebectomy

complication	after two days (%)	after six weeks (%)	
haematoma	23 (46.9)	1 (2.0)	
oedema	4 (8.2)	0	
blister formation	3 (6.1)	0	
hyperpigmentation	3 (6.1)	0	
haemorrhage	2 (4.1)	0	
phlebitis	0	1 (2.0)	
teleangiectatic matting	0	0	
dysaesthesia	0	0	
necrosis	0	0	
scar formation	0	0	
pressure urticaria	1 (2.0)	-	
pseudolymphatic cyst	-	-	1 (2.0%)

Tab. 4
Method and duration of
compression therapy after
ambulatory phlebectomy

adhesive bandage	compression hosiery	first author (ref.)	year
4–6 days	3 weeks	Muller (6)	1966
5–7 days	2 months	Ricci (10)	1995
5 days	5 days	Neumann (7)	1998
24–48 hours	3 weeks	Ramelet (9)	1999
48 hours	-	current study	2007

Discussion

Although all authors use compression after ambulatory phlebectomy there is no consensus on the duration of compression after this type of surgery (Tab. 4). In his original publication Robert Muller strapped his patients into an elastic adhesive bandage for the first four to six days followed by three weeks of elastic bandages during the day (5, 6). This is very much the same as Ramelet and Monti describe in their textbook „Phlebology the guide“. They instruct patients as follows (9): *“the patient must loosen the bandage slightly at night, when the legs are raised, and retighten it the next morning. The dressings is changed after 48 hours (24 hours when the procedure involves the popliteal fossa or dorsum of the foot). The minimal nature of haematomas is indicative of the efficacy of the elastic support. From then on, the bandages (often replaced by class II stockings) are worn only from the first thing in the morning to the last thing at night for three weeks.”*

In their textbook dedicated to ambulatory phlebectomy Ricci and Georgiev advise patients to wear adhesive bandages for five to seven days post-operatively followed by compression hosiery (class I or II) for another two months in uncomplicated cases (10).

Because we do not believe that one can routinely instruct patients how to loosen and adequately retighten bandages in the days following surgery we instruct patients to leave the bandages in place. For this purpose we use non-elastic bandages. As mentioned above we used to give compression for a total of ten days after surgery. The first five days a bandage on the treated area day and night, very much in line with Muller's original description. If only the thigh is banded there is the possibility of edema in the lower leg. This is why we also used to give these patients compression hosiery (class II) to be worn on top of the bandage at daytime during the first five days. Patients were advised to continue to wear their elastic stockings for another five days after removal of the bandages.

As stated earlier we found no major adverse events such as hemorrhages or post-operative bleeding during the follow-up period. In almost half of the patients treated however we saw haematomas at removal of the bandages that resolved at week six in all but one patient. We believe haematomas to be inherent to varicose vein surgery and not a complication. Nevertheless, we were interested in their occurrence (12). However, we realize that although not without adjuvant risks (2) with the use of tumescent anesthesia as advocated by some (1), the extent and the amount of haematoma may decrease.

At the beginning of the study we were apprehensive about the possible edema formation, since the bandage may act as a form of constriction. However, this only occurred in a minority (8.2%) of cases. The other complications are comparable to what has been published. There was one case of pseudolymphatic cyste which occurred in a female patient without a history of surgery of her leg or previous lymphoedema. She was treated with compression therapy for several weeks and has had no recurrence since.

Conclusion

This study has shown that it is feasible to significantly reduce the post-operative compression period without compromising the end-result. This is especially to the benefit of our patients who now can return to their daily activities within 48 hours without any compression (hosiery or other). Future studies may further explore the optimal duration of compression therapy after ambulatory phlebectomy.

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