Ann Med Res 2020;27(11):2899-903

Annals of Medical Research

DOI: 10.5455/annalsmedres.2020.06.633

Original Article

Short-term results of acupuncture in endovenous ablation treatment: Status of pain and patient satisfaction

Yavuz Orak[1] , Erdinc Eroglu[2]

[1]Department of Anesthesiology and Reanimation, Faculty of Medicine, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey
[2]Department of Cardiovascular Surgery, Faculty of Medicine, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey

Abstract

Aim: Our aim was to investigate the results of acupuncture in endovenous ablation treatment at 6–9 months.
Materials and Methods: Group C (control,n=35) and Group A (acupuncture,n=35) patients included in this study were called by the cardiovascular surgeon for 6–9-month check-ups.Demographic characteristics, visual analogue scale (VAS) score,6–9 months saphenous vein diameter,patient satisfaction,CEAP classification, and other findings were recorded in both groups.
Results: There was no difference between the groups in terms of age and body mass index.Patient satisfaction was higher in Group A (p=0.040).VAS scores were higher in Group C (p =0.002).There was an increase and a decrease in the saphenous vein diameter values of the patients at 6–9 months compared to the baseline values in Group C (p=0.004) and Group A (p=0.011),respectively.There was a decrease in the CEAP classification of the patients in Group C at 6–9 months compared to the baseline values (p=0,000).In Group A,there was a decrease in the CEAP classification of the patients at 6–9 months compared to the baseline values (p =0,000). In Group C,erythema 2 (5.7%),edema 7 (20.0%),and ıtching 7 (20.0%) were seen in the patients.In Group A, edema 3 (9.3%),itching 2 (5.8%),but not erythema were seen in the patients.In Group A, 34 of 35 patients stated their desire to recieve acupuncture again.
Conclusion: Acupuncture increased patient satisfaction and reduced VAS scores and CEAP classification at 6–9 months.Acupuncture affected the saphenous vein diameters positively.There were less complications in the acupuncture group at 6–9 months.

Keywords: Acupuncture; pain; patient satisfaction; varicose veins

INTRODUCTION

Acupuncture has been an important therapeutic method for thousands of years in the Far East. Acupuncture is established on the concept of the flow of vital energy flowing through multiple channels (meridians) (1). The discontinuity in this flow can cause disease. It is believed that the stimulation of the points on the meridians ensures the Yin-Yang balance and has a therapeutic effect (2). A wealth of experience have been accumulated in acupuncture application for chronic disease and pain control (3).

Varicose veins are seen in 25–33 % of adult women and 10–20 % of men and its annual incidence has been reported to be 2.6 % in women and 1.9 % in men (4). Varicose veins are dilated and they can cause pain, itching and skin changes in the leg (5). New treatment options such as mechanical chemical ablation have been developed for the treatment of varicose veins. One of these new treatment options is endovenous ablation with cyanoacrylate; the tissue adhesive of the insufficient vein. Variclose sealing systems have been developed for this purpose (BIOLASE FG Group, Ankara, Turkey) (6). Varicose veins lead to significant reductions in the quality of life without symptoms of chronic venous insufficiency (7). Severe pain is the most common symptom of varicose veins and edema (8). Evaluating the quality of life is important to measure the treatment efficacy in chronic cases (9).

The press neddle (PN) is a special acupuncture needle used in Japan, made by developing traditional intradermal needles (Figure 1). PN can continuously alert targeted acupuncture points non-invasively and in a safe manner for several days (10).

Our goal was to evaluate the results of acupuncture in the endovenous ablation procedure at 6–9 months.

Received: 18.07.2020 **Accepted:** 30.10.2020 **Available online:** 11.11.2020
Corresponding Author: Yavuz Orak, Department of Anesthesiology and Reanimation, Faculty of Medicine, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey **E-mail:** dryavuzorak@hotmail.com

MATERIALS and METHODS

Ethical approval was obtained from Ethics Committee with the decision of February 10, 2019, 2019/ 18-08. The study was carried out at Kahramanmaraş Sutcu Imam University Health Practice and Research Hospital in October 2019. Informed consent form was obtained from all the patients. This study was a prospective, randomized study. The patients were given a closed opaque envelope for randomization 24 hours before the operation. In group A, (acupuncture group, n = 35), bilateral acupuncture was applied to ST 36 (Suzanli), LI 4 (Hegu), LIV 3 (Taichong), LU 9 (Taiyuan), LU 7 (Lieque), SP 6 (Sanyinjiao) with a press needle (0.22x1.5 mm, Figure 1, Hua Long, Made in China), 24 hours before the endovenous ablation procedure. The press needle remained until 3 days after the procedure. No action was taken for group C (control group, n = 35). The group A patients were invited to the outpatient clinic on the 3rd day after the endovenous ablation procedure as well the controls and the study was completed. Group C and group A patients included in the study were then invited by the cardiovascular surgeon for the 6–9-month check-ups. All of the patients came to the outpatient clinic and were included in the study. Apart from these patients, no new patients were comprised in the study and no procedure was done.

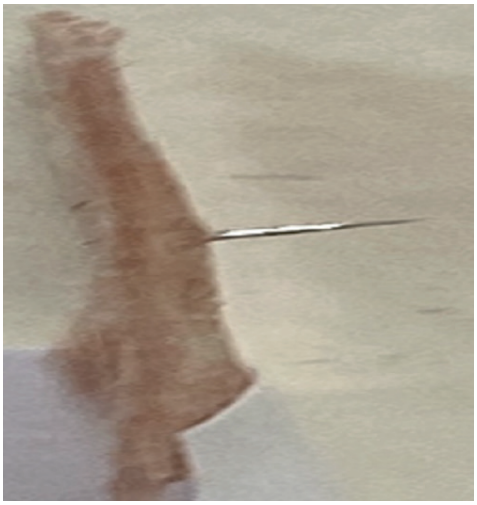

Figure 1. Press needle, left view

In groups, age, sex, body mass index (BMI), American Society of Anesthesiologists (ASA) score, 6-9-month visual analogue scale (VAS) score, and 6–9-month saphenous vein diameter were recorded. The patient satisfaction questionnaire was also administered (1: Very dissatisfied, 2: Dissatisfied, 3: Satisfied, 4: Very pleased). The response (Yes or No) to the question "Would you like to have acupuncture again?" was also recorded. The presence of erythema, edema, and itching was recorded. CEAP classification was conducted in the patients.

Comparisons were made between the groups in terms of age, BMI, patient satisfaction, and VAS. In addtion, a comparison was made between the groups in terms of erythema, edema, and itching. In-group comparisons were made in terms of saphenous vein measurements and CEAP classification. The baseline values were compared with the values measured at 6–9 months.

CEAP Classification (11,12)
Clinical Classification; C0: No evidence of venous disease, C1: Telangiectasia or reticular veins, C2: Varicose veins, C3: Edema, C4: Skin and subcutaneous skin changes, C4a: Pigmentation or eczema, C4b: Lipodermatosclerosis or white spots, C5: Improved venous ulcer, C6: Active venous ulcer, S: Symptomatic ulcer, A: Asymptomatic

Etiological Classification; Ec: Congenital, Ep: Primary, Es: Secondary, En: No venous cause has been identified.

Anatomical Classification; As1–5: Superficial veins, Ap17–18: Perforator veins, Ad6–16: Deep Veins, An: Venous localization has not been determined

Pathophysiological Classification; Pr: Reflux, Po: Obstruction, Pro: Reflux and obstruction, Pn: Venous pathophysiology not determined.

Acupuncture Points
The SP 6 point (Sanyinjiao) is located on the medial sideof the lower leg, 3 cun above the medial malleolus; LI 4 (Hegu) on the dorsum of the hand, between the 1st and 2nd metacarpal bones; ST 36 (Suzanli) on the anterior side of the lower leg, 3 cun below ST 35; LİV 3 (Taichong) on the dorsum of the foot, in the depression proximal to the 1st metatarsal space; LU 9 (Taiyuan) on the radial end of the transverse wrinkle of the wrist, where the radial artery pulsates; and LU 7 (Lieque) on the radial margin of the forearm, superior to the styloid process of the radius (13).

N-Butyl Cyano acrylat Uygulaması
Endovenous ablation with cyanoacrylat was performed by standard procedure at baseline (6).

Statistical Analysis
The data collected in this study were used the Statistical Package for Social Sciences for Windows 25.0 program. Data were expressed as average ± standard deviation and median (minimum-maximum). The normality tests of the data were done using the Kolmogorov-Smirnov and Shapiro-Wilk normality tests. Both parametric and non-parametric tests were used in the study. Quantitative data were compared using the independent sample t test for groups with a normal distribution and Mann Whitney U test for groups without a normal distribution. To compare the first and second measurements, the dependent sample t test and Wilcoxon sign test were used for variables that were and were not normally distributed, respectively.

RESULTS

No difference was between the groups in terms of age, BMI, and ASA scores (p>0.05). There was a difference in sex distribution between both groups (p =0.006) with significantly more women in both groups. Patient satisfaction was higher in group A compared to group C (p =0.040). VAS score values were higher in group C compared to group A (p =0.002) (Table 1).

Table 1. Demographic data of the groups, evaluation of patient satisfaction and VAS

			Group A (n=35)	Group C (n=35)	X^2/t/ MW-U	P
Age	(years)	$\bar{X}$ ± S.S.	46.91 ± 11.60	48.43 ± 14.17	0.49[b]	0.626
Sex	Female	n(%)	34(97.1)	26(74.3)	7.467[a]	**0.006***
	Male	n(%)	1(2.9)	9(25.7)		
BMI	(kg/cm²)	$\bar{X}$ ± S.S.	29.72 ± 3.59	28.76 ± 7.00	−0.75[b]	0.460
ASA	1	n(%)	15(42.9)	23(65.7)	3.684[a]	0.055
	2	n(%)	20(57.1)	12(34.3)		
Patient Satisfaction		$\bar{X}$ ± S.S.	3.66 ± 0.48	3.37 ± 0.65	−2.10[b]	**0.040***
VAS	Median(min-max)		0.00 (0.00–1.00)	0.00 (0.00–2.00)	415.50[c]	**0.002***

[a]Chi-Square test; a:0,05, * difference is statistically significant, [b]Independent t test; a:0,05, [c]Mann-Whitney U test; a:0,05, Body Mass Index; BMI, American Society of Anesthesiologists; ASA, Visual Analog Scale; VAS

Table 2. Comparison of intra-group saphenous vein diameter and CEAP classification at two time intervals

	Baseline			6-9 Months				
Group C	**Median**	**Min**	**Max**	**Median**	**Min**	**Max**	**Test value**	**p**
Saphenous vein diameter (mm)	4.40	3.60	8.70	4.80	3.50	9.00	−2.893[a]	**0.004***
		$\bar{X}$ ± S.S.			$\bar{X}$ ± S.S.			
CEAP		3.17±0.45			2.68±0.80		5.667[b]	**0.000***
Group A		$\bar{X}$ ± S.S.			$\bar{X}$ ± S.S.			
Saphenous vein diameter (mm)		4.31±1.21			4.22±1.19		−2.705[b]	**0.011***
CEAP		2.74±0.61			2.09±0.51		7.210[b]	**0.000***

[a]Mann-Whitney U test; [b]Independent t test a:0,05; a:0,05; * difference is statistically significant

Table 3. Complications seen among the groups at 6–9 months

			Group C (n=35)	Group A (n=35)	Total (N=70)
Erythema	Yes	n (%)	2 (5.7)	0 (0.0)	2 (2.9)
	No	n (%)	33 (94.3)	35 (100.0)	68 (97.1)
Edema	Yes	n (%)	7 (20.0)	3 (9.3)	10 (28.5)
	No	n (%)	28 (80.0)	32 (90.7)	60 (61.5)
Itching	Yes	n (%)	7 (20)	2 (5.8)	9 (12.8)
	No	n (%)	28 (80.0)	33 (94.2)	61 (87.2)

In group C, there was a increase in the saphenous vein diameters at 6–9 months compared to the baseline (p =0.004). In group C, there was a significant decrease in terms of the CEAP classification of the patients at 6–9 months compared to the baseline classification (p =0,000) (Table 2); CEAP classification decreased in 8 patients, increased in 24 patients, and did not change in 3 patients.

In group A, there was a significant decrease in the saphenous vein diameters compared to the baseline (p =0.011) at 6–9 months. There was a significant decrease in terms of the CEAP classification of the patients at 6–9 months compared to the baseline classification (p =0.000) (Table 2); CEAP classification decreased in 22 patients and did not changed in 13 patients. In group C, erythema 2 (5.7%), edema 7 (20.0%), and itching 7 (20.0%) were seen in the patients while in group A, edema 3 (9.3%) and itching 2 (5.8%), but not erythema were seen in the patients (Table 3). In Group A, 34 of 35 patients stated their desire to recieve acupuncture again.

DISCUSSION

In this study, the patients were comfortable undergoing acupuncture. VAS scores and CEAP classification were lower in the group A at 6–9 months. Acupuncture had a positive effect on the saphenous vein diameters. Clinical findings (erythema, edema, itching) were less frequent at 6–9 months in the group A. A study showed that HE fire needle therapy was effective on primary varicose veins. It significantly reduced the severity of the disease symptoms and frequency of attacks and improved the patients' quality of life. This treatment efficacy sustained for up to 8 weeks after treatment (14). Another study showed a lower health-related quality of life (HRQoL) score among in patients receiving acupuncture therapy for musculoskeletal complaints in an outpatient acupuncture clinic. The patients experienced clinically significant improvements in HRQoL during the acupuncture treatments (15). In our study, patient satisfaction continued even after 6–9 months in the group A, VAS scores were lower, and most of the patients stated that they wanted to have acupuncture again. A study in dogs showed that using acupuncture alone or in combination with analgesics/adjuvant analgesics, relieves pain and improves the quality of life in neurological and/or musculoskeletal diseases (16). A study of patients with osteoarthritis pain showed that acupuncture improved HRQoL and increased patient efficacy and satisfaction (17). Local and systemic mechanisms of acupuncture are based on the release of neurotransmitters (such as endorphins, encephalins, dinorphins, norepinephrine, dopamine), changes in the cell signal, and modulation of the N-methylD-aspartate receptor (18). Acupuncture regulates inflammatory processes by increasing blood circulation in the affected areas (19). It also reduces inflammation, increases blood circulation in the affected area (20), and arterial blood flow (21). Another study showed that ST 36 acupuncture stimulations increase the blood flow rate and relaxation effect of the radial artery and peripheral arterioles, increase the radial pulse pressure, and blood flow rate in the radial artery (22). Acupuncture accelerates the healing of wounds that do not respond to conventional treatment (23). In our study, saphenous vein diameters decreased in 8 patients, increased in 16 patients, and did not change in 11 patients at the 6–9th month in group A. In group C, saphenous vein diameters decreased in 8 patients, increased in 24 patients, did not change in 3 patients. Wound healing is a complex process involving inflammation, angiogenesis (24). A study showed that acupuncture treatment applied to the wound edges supports wound healing by reducing inflammatory cytokine release and stimulating angiogenesis and granulation-tissue formation (19). In our study, no erythema was observed in group A, while edema and itching were seen in fewer patients. CEAP classification was also positively affected.

Limitation: The single-center design of the study and the measurement of saphenous vein diameters by the same surgical team are the limitations of our study.

The effects of acupuncture in the acute period are known. In this study, the benefits of acupuncture in the acute period continued at 6–9 months. As far as we know, there is limited information in the literature regarding the results of acupuncture at 6–9 months of endovenous ablation treatment. In particular, the effect of acupuncture on saphenous vein diameter should be investigated with more advanced techniques and methods. These results will enable anaesthesiologists and surgeons consider acupuncture as an auxiliary option in interventional procedures. We are considering further studies on this subject.

CONCLUSION

Acupuncture increased patient satisfaction and reduced pain levels and CEAP classification at 6–9 months. In addition, it positively affected the saphenous veins and complications were less frequent in the acupuncture group at 6–9 months.

Acknowledgment: Authors would like to thank Enago (www.enago.com) for the English language review.

Conflict of interest: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical approval: The study was approved by Kahramanmaraş Sutcu Imam University ethical Committee (Approval number: 2019/18-08).

REFERENCES

1. Kaptchuk TJ. Acupuncture: theory, efficacy, and practice. Ann Intern Med 2002;136:374-83.
2. Acar HV. Acupuncture and related techniques during perioperative period: a literature review. Complement Ther Med 2016;29:48-55.
3. Irnich D, Winklmeier S, Beyer A, et al. Electric stimulation acupuncture in peripheral neuropathic pain syndromes. Clinical pilot study on analgesic effectiveness. Schmerz 2002;16:114-20.
4. Nicolaides AN, Allegra C, Bergan J, et al. Management of chronic venous disorders of the lower limbs: guidelines according to scientific evidence. Int Angiol 2008;27:1-59.
5. Heller JA, Evans NS. Varicose veins. Vasc Med 2015;20:88-90.
6. Yasim A, Eroglu E, Bozoglan O, et al. A new non-tumescent endovenous ablation method for varicose vein treatment: Early results of N-butyl cyanoacrylate (VariClose_). Phlebology 2017;32:194-9.
7. Shepherd AC, Gohel MS, Lim CS, et al. A study to compare disease-specific quality of life with clinical anatomical and hemodynamic assessments in patients with varicose veins. J Vasc Surg 2011;53:374-82.
8. Smyth RMD, Aflaifel N, Bamigboye AA. Interventions for varicose veins and leg oedema in pregnancy. Cochrane Database Syst Rev 2015;10:CD001066.

9. Reid J, Wiseman ML, Scott EM, et al. Development, validation and reliability of a web-based questionnaire to measure health-related quality of life in dogs. J Small Anim Pract 2013; 54:227-33.
10. Kawakita K, Okada K. Acupuncture therapy: mechanism of action, efficacy, and safety: a potential intervention for psychogenic disorders?. Biopsychosoc Med 2014;8:4.
11. Meissner MH, Gloviczki P, Bergan J, et al. Primary chronic venous disorders. J Vasc Surg 2007;46:54-67.
12. Padberg FT. CEAP classification for chronic venous disease. Dis Mon 2005;51;176-82.
13. http://acupuncture.com/education/points/lung/lu9.htm
14. Wang L, Chu K, Zeng L, et al. Primary varicose veins treated with HE's fire needle therapy: a randomized controlled trial. Zhongguo Zhen Jiu 2016;36:231-6.
15. Van den Berg I, Tan L, van Brero H, et al. Health-related quality of life in patients with musculoskeletal complaints in a general acupuncture practice: an observational study. Acupunct Med 2010;28:130-5.
16. Nuno E.O.F. Silva, Stelio P.L. Luna, Jean G.F. Joaquim, et al. Effect of acupuncture on pain and quality of life in canine neurological and musculoskeletal diseases. Can Vet J 2017;58:941-51.
17. Linde K, Weidenhammer W, Streng A, et al. Acupuncture for osteoarthritic pain: an observational study in routine care. Rheumatology (Oxford) 2006;45:222-7.
18. Zhao. Neural mechanism underlying acupuncture analgesia. Prog Neurobiol 2008;85:355-75.
19. Park SI, Sunwoo YY, Jung YJ, et al. Therapeutic effects of acupuncture through enhancement of functional angiogenesis and granulogenesis in rat wound healing. Evid Based Compl Alt 2012;2012:464586.
20. Braddock M, Campbell CJ, Zuder D. Current therapies for wound healing: electrical stimulation, biological therapeutics, and the potential for gene therapy. Int J Dermatol 1999; 38:808-17.
21. Takayama S, Watanabe M, Kusuyama H, et al. Evaluation of the effects of acupuncture on blood flow in humans with ultrasound color Doppler imaging. Evid Based Compl Alt 2012;2012:513638.
22. Kim TH, Ku B, Bae JH, et al. Hemodynamic changes caused by acupuncture in healthy volunteers: a prospective, single-arm exploratory clinical study. BMC Complem Altern M 2017;17:274.
23. Sumano H, Mateos G. The use of acupuncture-like electrical stimulation for wound healing of lesions unresponsive to conventional treatment. Am J Acupunct 1999;27:5-14.
24. Chodorowska G, Skorupska DR. Cutaneous wound healing. Ann Univ Mariae Curie Sklodowska Med 2004;59:403-7.