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Original Research Article

The Evaluation of Symptoms and Complications in the Treatment of Symptomatic Varicose Veins with Endovenous Laser Ablation

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ABSTRACT

Background: Varicose vein is a problem that is frequently faced by all health professionals. The main objective in the treatment of varicose veins in the lower extremities is to eliminate symptoms of the patient such as pain, itching, burning, heaviness, bleeding and ulceration (if any) by considering aesthetic concerns. It is very important to inform patients about the treatment of varicose veins and to direct them. We aimed to determine the impact and success rate of EVLA that holds an important place in the treatment of symptomatic varicose veins on the symptoms and complications.
Methods: EVLA was applied to 194 patients that have no contraindication for EVLA between June 2012- April 2014. Bilateral EVLA was applied to 55 patients. Sociodemographic and clinical characteristics of the patients were evaluated before EVLA. Before EVLA symptoms connected with varicose veins, after EVLA symptoms of varicose veins and complications which are dependent on EVLA were evaluated in the first week, first month and sixth month. Visual analog scale was used to assess the level of pain.
Results: EVLA was applied to 249 veins, after EVLA, patients said they mostly felt severe pain in the first week but, it was determined that the pain and other symptoms decreased gradually. Paresthesia and hematoma were seen in patients in the first week at most, over time, a decrease was seen in these complications. Complete occlusion was detected in all 249 vessels that were treated in RDUS in the first week and month. The occlusion rate in the sixth month was at a high level such as 99.20%. Conclusion: As a result of our EVLA application, we can say that the rates of symptoms and complications were quite low and the success rate was quite high.

Keywords: Endogenous Laser Ablation, Varicose Vein, Symptoms, Complications

INTRODUCTION

Varicose veins that are caused by venous insufficiency are considered important by patients and very common in the community. [1] Common symptoms of varices due to venous insufficiency are; pain, swelling, cramp, itching, pigmentation and venous ulcers. The pain that occurs in venous insufficiency increases during the hot seasons and typically standing up and

decreases in supine position and in cold environments. Having a leg cramp occurs more at night. Venous ulcer is usually seen typically in the medial face of the leg. Venous hypertension occurring in venous insufficiency may lead to thrombus formation in the varicose veins due to the slow flow. This condition that is called superficial thrombophlebitis is characterized by pain, edema and rashes around the heir to the clot formation. Generally, compression can be easily treated with anti-inflammatory and anticoagulants, but it may cause deep vein thrombosis and even pulmonary embolism by reaching deep veins. [2,3]

In recent years, there have been important advances in the diagnosis and treatment of venous insufficiency. Color Doppler Ultrasonography (CDUSG) has been used first in the diagnosis and second in the treatment of venous insufficiency. With this development, thermal ablation methods have been developed such as endovenous laser ablation (EVLA) and these methods that were applied under local anesthesia guided by ultrasonography (USG), replaced by a rapid surgical treatment in the entire World. [1]

In endovenous laser ablation, veins causing reflux are covered by heat under local anesthesia with laser fiber that is inserted into the lumen (ablation) and then, they are eliminated by the body with fibrosis. The most important advantages of this method are; being performed under local anesthesia, being painless, no lack of wound-cut trail and patient's ability to walk up to his feet immediately after the operation. Because of these advantages, EVLA method has become the first choice of treatment status in a short time all over the world for the relief of venous insufficiency. The "reason" of varicose veins is removed by EVLA and the other symptoms of pain, cramp and swelling of venous insufficiency are reduced or absent. [4-6]

Dilatation of varicose veins that is the major complaint of varicose vein patients raises serious cosmetic concerns in patients. In addition to this cosmetic concern, the number of patients that avoid surgery section increases with the progress of ablation techniques. [7] Varicose vein is a problem that is frequently faced by all health professionals. The main objective in the treatment of varicose veins in the lower extremities is to eliminate symptoms of the patient such as pain, itching, burning, heaviness, bleeding and ulceration (if any) by considering aesthetic concerns. It is very important to inform patients about the treatment of varicose veins and to direct them. In this context, we aimed to determine the impact and success rate of EVLA that holds an important place in the treatment of symptomatic varicose veins on the symptoms and complications.

MATERIALS AND METHODS

In the descriptive study, it was aimed to evaluate symptoms connected with varicose veins before EVLA, symptoms of varicose veins and complications after EVLA in the first week, first month and sixth month.

The sampling was not considered in the research. Between June 2012- April 2014, all 194 patients (249 vessels) were included in the study who had EVLA in Cardiovascular Surgery Clinic, who had no contraindication for EVLA and diagnosed by chronic venous insufficiency in a Private Hospital.

Following the history and clinical examination, the great saphenous vein failure (GSV) was determined by RDUSG for all patients. Venous insufficiency evaluation was performed in outpatients. GSV insufficiency and GSV diameter of planned interference level were noted by

preoperative RDUSG made by operator. When insufficiency was suspected due to increased diameter or relationship with varicose veins, the venous reflux flow was viewed. Diameter measurements that exceed 5 mm in superficial femoral and ambulatory measurement and 3.5 mm in perforating veins of outpatients were considered as venous insufficiency. In the classification of chronic venous insufficiency severity, CEAP system was taken into account.

EVLA was applied to the patients with tumescent anesthesia. 1470 nm radial fiber laser was used. Catheter was removed after EVLA and the puncture area was sealed in a sterile manner. The legs were wrapped with an elastic bandage.

After the procedure, three months medical treatment and compression stockings were used. In the conduct of research, informed consent, autonomy, privacy and confidentiality protection, equity and not harming/usefulness principles were considered. Written consent was obtained from the relevant institutions to do the research. Before applying to the patients that participated in the study, the aim of the study, plan and benefits were explained; the necessary information about the process was given.

Before the procedure, sociodemographic and clinical characteristic of the patients were evaluated. Visual analogue scale (VAS) was used in the assessment of the pain level. A value of 0 means " no pain", a value of 10 means " intolerable pain".

Statistical analysis: Data were evaluated in SPSS 21.0 (SPSS Inc., Chicago, IL, USA) statistical program. As a method of analysis, mean±standard deviation, frequency (n) and percentage (%) values were used for categorical variables.

RESULTS

Socio-demographic and clinical characteristics of patients before EVLA were shown in Table 1. 77.83% of the patients were female and 12.88% had HT, 16.49% had DM diagnosis and 76.29% of them had a family history of varicose veins.

Table 1 Socio-demographic and clinical characteristics of patients (n=194)

Variables	n	%	Variables	n	%
Gender			Varicose veins in the first degree relative		
Female	151	77.83	Yes	148	76.29
Male	43	22.17	No	46	23.71
HT			DM		
Yes	25	12.88	Yes	32	16.49
No	169	87.12	No	162	83.51
CEAP sınıflaması (249 damar)			Age	41.12±9.32	
Class 2	142	57.03			
Class 3	88	35.34			
Class 4	13	5.23			
Class 5	1	0.40			
Class 6	5	2.00			

CEAP C: Clinical presentation, E: Etiologic factors, A: Anatomical distribution, P: pathophysiological conditions, DM: diabetes mellitus, HT: hypertension EVLA was applied to 249 vessels and symptoms before and after EVLA were shown in Table 2. In the first week after EVLA, patients said they mostly felt pain in the first week but, it was determined that the pain and other symptoms decreased gradually (Table 2)

In patients, mostly in the first week paresthesia, hematoma and induration were seen and these complications decreased over time. A complete occlusion was detected in all 249 vessels that were treated in RDUS in the first week and month. The occlusion rate

in the sixth month was at a high level such as 99.20% in spite EVLA was applied to the patients in 4, 5 and 6 category in the classification of CEAP (Table 3).

Table 2 Symptoms of patients (n=249)

SYMPTOMS	n	%	SYMPTOMS	n	%
Before the operation			After a month of operations		
Pain			Pain		
Slight	19	7.63	Slight	153	61.45
Disturbing	103	41.37	Disturbing	75	30.12
Severe	83	33.33	Severe	19	7.63
Very severe	32	12.85	Very severe	2	0.80
Intolerable	12	4.82	Intolerable	0	0
Cramp			Cramp		
Yes	149	59.84	Yes	12	4.82
No	100	40.16	No	237	95.18
Edema			Edema		
Yes	94	37.75	Yes	10	4.01
No	155	62.25	No	239	95.99
Itching			Itching		
Yes	96	38.55	Yes	5	2.00
No	153	61.45	No	244	98.00
Pigmentation			Pigmentation		
Yes	34	13.65	Yes	5	2.00
No	215	86.35	No	244	98.00
After a week of the operation			After six month of operations		
Pain			Pain		
Slight	12	4.82	Slight	201	80.72
Disturbing	48	19.28	Disturbing	42	16.87
Severe	168	67.47	Severe	6	2.41
Very severe	21	8.43	Very severe	0	0
Intolerable	0		Intolerable	0	0
Cramp			Cramp		
Yes	37	14.86	Yes	3	1.20
No	212	85.14	No	246	98.80
Edema			Edema		
Yes	79	31.73	Yes	2	0.80
No	170	68.27	No	247	99.20
Itching			Itching		
Yes	45	18.07	Yes	2	0.80
No	204	81.93	No	247	99.20
Pigmentation			Pigmentation		
Yes	22	8.84	Yes	2	0.80
No	227	91.16	No	247	99.20

Table 3 Complications seen in the patients (n=249)

	First week		First month		Sixth month	
Complication	n	%	n	%	n	%
Paresthesia	25	10.04	6	2.41	0	0
Phlebitis	1	0.40	0	0	0	0
Hematoma	67	26.90	12	4.82	0	0
Induration	12	4.82	2	0.80	0	0
Burn	0	0	0	0	0	0
DVT	0	0	0	0	0	0
The ratio of occlusion	249	100	249	100	247	99.20
Recanalization	0	0	0	0	2	0.80

DVT: deep vein thrombosis

DISCUSSION

Venous insufficiency and varicose veins have a negative impact on quality of life of the patients and also leads to significant labor losses. [8,9] EVLA is the most preferred method in the treatment of varicose veins. Bos et al. (2009) found that in the meta-analysis they did, regardless of the follow-up period EVLA (93.3%) and radiofrequency ablation (RFA) (87.5%) success rate is higher than foam sclerotherapy (UGFS) with stripping and ultrasound. It was emphasized that EVLA is more effective treatment than surgery, UGFS and RFA. [10] Nesbitt et al. (2014) examined randomized controlled studies and found that when it is compared with surgical treatment, major complications are fewer and faster to return normal activity following EVLA and RFA.[11] Darwood et al. (2008) indicated that EVLA provides early return to normal activities and provides important socio-economic benefits when compared to surgical treatment. [12] Doğancı and Demirkilic (2010), in EVLA application, using 1470 nm radial catheter has less side effects according to other wavelength lasers. [13] In the study of Kavala et al.(2014), using 1470 nm wavelength radial tip of the catheter causes higher efficacy and less unwanted side-effect profile. [14]

In our study, 77.83% of the patients were female and the mean age was 41 and 12.88% had HT, 16.49% had DM diagnosis and 28.35% had double-sided EVLA application, 57.3% of them were in CEAP 2 category, 76.29% of them had a family history of varicose veins. Even though there are minor differences in the studies, the results were similar in line with our work. In the studies of Van den Bremer et al. (2009), the mean age of the patients was 45.1 year and 91% of them were female and 81.1% of them were in CEAP 2 group. [15] In the study of Güvenç (2009), 76% of the patients were female, 24% of them were male, the mean age was 45.96±10.4 and 86% of them had a positive family history about varicose veins. [16] In the study of Tan et al. (2009), they examined 169 patients who had EVLA; 66.3% of the patients were female, their mean age was 54 (19-78), 59.8% of them had bilateral and 40.2% had unilateral EVLA. [17] In the study of Gücü et al. (2014), 48% of the patients were male (mean age: 42.1±13.4), 52% of them were female (mean age: 44.68±10.6) and in this preoperative examination, 5 patients had HT, 4 had DM diagnosis. [18]

In our patient group, symptoms before EVLA were examined; 41.37 of them had felt irritating pain, 33.33% had felt severe pain, 59.84% had cramp, 37.75%had edema, 38.55% had itching, 13.65% had discoloration in the skin. In particular, CEAP classification distribution of intravenously applied EVLA in the research may affect these symptoms, so there can be some differences between researches. In a study of Bradbury et al. (1999), it was found that 53.8% of the women with complaints of varicose veins had pain, 23% of them had edema complaint, and 19.8% of them had tingling complaint. [19] In the study of Özdemir et al. (2006), it was found that 87.5% of the nurses that participated in the research and had varicose veins had pain, 55.9% of them had edema, 46.7% had tingling, 42.8% had burning sensation and 93.4% had complaint about more evident vessels. [20] In the study of Güvenç (2009), pain and visible varicose veins are present in all patients; other symptoms were like swelling of the limbs (47.1%), pruritus (34%), healed ulcer (3.8%), active ulcer (1.9%) and skin color changes (26.4%). [16] In the study of Tan et al. (2009), 47.9% of the patients had cramp and pain in the lower extremity and 16.6% had swelling symptoms. [17] In the study of Gücü et al. (2014), 53% of the patients had pain and

cramp in the lower extremity, 18% had swelling and diameter increase, 4% had pigmentation in the skin in the preoperative evaluation of patients. [18]

In our study, in the first week after EVLA, patients often felt pain but pain and other symptoms decreased over time with medical treatment and stocking compressing application. Similar results were found in studies also. In the study of Güvenç (2009), EVLA was applied to 90 vessels and mild-to-moderate thigh-leg pain (84%) was determined in the patients and it was easily treated with medication. The complaints of the 5 patients that had pain stopped in a day and 44 said that pain stopped in a week, only one patient had pain during a month. [16] In the six-month follow-up, Tan et al. (2009) determined that 4.1% of the patients had skin pigmentation. [17] In the study of Pannier et al. in 2011, it was stated that EVLA was applied to 50 patients and 44% of the patients had no pain after treatment. [21] In the studies of Van den Bremer et al. (2009), the pain perception of the patients after EVLA that was applied to 261 vessels was evaluated by VAS score (0- no pain, 10-severe pain), and in the first week, VAS score was 1.64. [15] In the studies of Gücü et al. (2014), the patient satisfaction of 98 patients after EVLA was evaluated by VAS (0-10), at the end of the 6 weeks, the complaints of 37.7% of the patients disappeared, in the complaints of 58.8%, a recovery occurred between 5-9 points and in the complaints of 3.6%, there had been an improvement in the symptoms between 1-4 points. [18] In the study of Doğancı and Demirkılıç (2010), the patients were satisfied from the results that had EVLA application. [13]

10.4% of the patients after EVLA had paresthesia, 26.90% of the patients had hematoma in the first week and over time, and these complications had decreased. There had not been observed severe complications like DVT, burn or embolus. Literature information has similar direction. In the studies of Van den Bremer et al. (2009), they had evaluated EVLA applications in 323 persons and 403 legs and they said that hematoma and paresthesia was frequently observed, however, DVT, pulmonary embolus or skin ulcers were not observed that were major complications. [15] In the study of Güvenç (2009), major complication did not occur except slight paresthesia in three patients and the complaints of these patients regressed spontaneously in a month. In the same study, a slight bruising (90%) was found in the patients but ecchymosis resolution occurred about 2 weeks. [16] Tan et al. (2009) determined that 4.1% of the patients had skin pigmentation during six-month follow up. [17] In the study of Pannier et al. (2009), EVLA was applied to 100 patients and a year later, 45 patients said that they were satisfied with this method, 34 patients said that they were not satisfied but there had been no serious complication. Six months later paresthesia rate in legs was 9.5%, a year later it was 7.6% and it was stated that EVLA process had high success rate and safe and effective treatment option. [22] In another study, serious complications were not observed in any patient. In the first month 4 patients, in the sixth month 3 patients had local paresthesia. 80% of the patients had no ecchymosis and it was stated that EVLA was safe and effective treatment option. [21]

In our study, a complete occlusion was detected in all 249 vessels that were treated in RDUS in the first week and month. The occlusion rate in the sixth month was at a high level such as 99.20% in spite EVLA was applied to the patients in 4, 5 and 6 category in the classification of CEAP. Our results are similar to other studies. In the study of Doğancı Demirkilic (2010) where they used 2 different laser catheter

(980 nm bare fiber laser and 1470 nm radial fiber laser), 60 patients had 100% occlusion in the early period. [13] In the study of Van den Bremer et al. (2009), they stated the complete occlusion rate as 93.7% after 6 weeks. [15] Sharif et al. (2006) reported that 143 treated legs' complete occlusion rate in the 1-year control was 94%. [23] In another clinical study, it was reported that 1076 legs to which EVLA was applied had occlusion rate as 99% in the early period and in the controls after 36 months, this rate was 97%. [24] In the study of Güvenç (2009), it was detected that 90 vessels that were treated in the first week RDUS controls had complete occlusion. [16] Min et al. (2003) included 423 patients and in total 499 GSV, in a 3-year follow-up series in which EVLA applied, they reported occlusion rates as 98.2% in GSV. [4] Duran et al. (2005) reported occlusion rates as 98% in the series where 112 GSV was available. [25]

CONCLUSIONS

As a result, our study and many other studies showed that symptomatic varicose vain treatment with the method of EVLA is a minimal invasive treatment option preferred by patients with its clinical and aesthetic results and being reliable, efficient, relatively atraumatic and advantageous. It is a treatment method that can be easily recommended to the patients that want to get rid of varicose veins and having reduced quality of live due to varicose veins.

Author Contributions

Conception and design: DA, CA
Analysis and interpretation: DA, SÇ
Data collection: DA
Writing the article: DA, CA
Critical revision of the article: SÇ
Final approval of the article: DA
Statistical analysis: DA, SÇ
Obtained funding: Not applicable
Overall responsibility: DA

REFERENCES

1. Yılmaz S. Venous insufficiency and varicose veins in treatment of the current approach. Clinical Development 2010; 2:57-62.
2. Labas P, Cambal M. Profuse bleeding in patients with chronic venous insufficiency. Int Angiol 2007;26:64-66.
3. Marchiori A, Mosena L, Prandoni P. Superficial vein thrombosis: risk factors, diagnosis, and treatment. Semin Thromb Hemost 2006; 32:737-743.
4. Min RJ, Khilnani N, Zimmet SE. Endovenous laser treatment of saphenous vein reflux: long-term results. J Vasc Interv Radiol 2003;14:991-996.
5. Yılmaz S, Çeken K, Alparslan A, et al. Endovenous laser ablation for saphenous vein insufficiency: immediate and shortterm results of our first 60 procedures. Diagn Interv Radiol 2007; 13: 156-163.
6. Morrison N. Saphenous ablation: what are the choices, laser or RF energy. Semin Vasc Surg 2005; 18:15-18.
7. Özçalışkan Ö, Arslanoğlu Y, Deniz H, et al. Early and mid term results of our 120 patients treated with endovenous ablation techniques in terms of deep venous thrombosis and clinical ımprovement. Turkish Journal of Vascular Surgery 2012; 21:263-268.
8. Çöl C. Varicose veins sclerotherapy in the treatment of the place. Nursing Forum 2000; 3;38-40.
9. Palfreyman SJ, Drewery-Carter K, Rigby K, et al. Varicose veins: a qualitative study to explore expectations and reasons for seeking treatment. Journal of Clinical Nursing2004;13:332-340.
10. Bos RVD, Arends L, Kockaert M, et al. Endovenous therapies of lower extremity varicosities: A meta-analysis. J Vasc Surg 2009;49:230-239.
11. Nesbitt C, Eifell RKG, Coyne P, et al. Endovenous ablation (radiofrequency and laser) and foam sclerotherapy versus conventional surgery for great

saphenous vein varices. Cochrane Database Syst Rev 2011;5:CD005624.
12. Darwood RJ, Theivacumar N, Dellagrammaticas D, et al. Randomized clinical trial comparing endovenous laser ablation with surgery for the treatment of primary great saphenous varicose veins. Br J Surg 2008;95:294-301.
13. Doganci S, Demirkilic U. Comparison of 980 nm laser and bare-tip fibre with 1470 nm laser and radial fibre in the treatment of great saphenous vein varicosities: A prospective randomised clinical trial. Eur J Vasc Endovasc Surg 2010;40:254-259.
14. Kavala AA, Şişli E, TürkyılmazS, et al. The Comparison of 1470 and 980 Nanometer Wave-Lenghts Used in Endovenous Laser Ablation in Regard to Side Effects and Recanalization. Turkiye Klinikleri J Med Sci 2014;34:345-350.
15. Van den Bremer J, Joosten PP, Hamming JF, et al. Implementation of endovenous laser ablation for varicose veins in a large community hospital: the first 400 procedures. Eur J Vasc Endovasc Surg 2009;37:486-491.
16. Güvenç Z. Evaluation of the efficacy of endovenous laser ablation for patients with lower limb chronic saphenous and perforating vein in sufficiency. Başkent University, Faculty Of Medicine, Department Of Radiology. Specialty Thesis. Ankara, 2009.
17. Tan KK, Nalachandran S, Chia KH. Endovenous laser treatment for varicose veins in Singapore: a single centre experience of 169 patients over two years. Singapore Med J 2009;50:591-594.
18. Gücü A, Erdolu B, Ay D, et al. The Evaluation of Patient Satisfaction With Visual Analog Scale After Treatment of Varicosities With Endovenous Laser Ablation: Case Series. Journal of Vascular Surgery 2014;23(1):29-33.
19. Bradbury A, Christine E, Allan P, et al. What are the symptoms of varicose veins? Edinburgh vein study cross sectional population survey. BMJ 1999; 318:353-356.
20. Özdemir N, Khorshid L. The investigation of varicosity complaints and signs in nurses. Journal of Ege University Nursing School 2006;22:19-35.
21. Pannier F, Rabe E, Rits J, et al. Endovenous laser ablation of great saphenous veins using a 1470 nm diode laser and the radial fibre--follow-up after six months. Phlebology 2011;26: 35-39.
22. Pannier F, Rabe E, Maurins U.First results with a new 1470-nm diode laser for endovenous ablation of incompetent saphenous veins. Phlebology 2009;24: 26-30.
23. Sharif MA, Soong CV, Lau LL, et al. Endovenous laser treatment for long saphenous vein Incompetence. Br J Surg 2006;93:831-835.
24. Agus GB, Mancini S, Magi G, IEWG. The first 1000 cases of Italian Endovenous laser Working Group (IEWG). Rationale, and long term outcomes for the 1999-2003 period. Int Angiol 2006;25:209-215.
25. 2525Duran M. Endovenous laser treatment with 980 diode laser: follow up in two years in 670 procedures. Presented at: 15th ed. World Congress of UIP; Rio, Brazil, 2005.

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