

## The Comparison effect of using a period of microneedling and surgical vein cut usage in the treatment of women with varicose leg

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### ABSTRACT

*The present study aims to compare the effect of a period of microneedling and surgical vein cut usage in the treatment of women with varicose leg. For this purpose, 30 women were selected as subjects with varicose veins of the lower limb. After randomization of subjects into three groups of 10 people, for 20 weeks, a meeting every 4 weeks and a total of 5 sessions using microneedling and surgical vein cut was conducted on patients. The control group did not have any therapeutic intervention. To analyze the data, paired and independent t-test were used at a significance level of  $0.05 > P$ . The findings have shown that among the measured values the improvement index before and after the test for microneedling significantly increases and decreases respectively  $0.05 > P$ . The results showed that the use of microneedling can be used as a safe and effective treatment in people with varicose veins of the lower body. The study showed a 76 percent reduction in the size of the ankle after treatment of the groups receiving surgical vein cut.*

**Key words:** varicose veins, Microneedling, surgical vein cut.

### INTRODUCTION

Varicose veins originating from the Latin root Varix means twisted, and it refers to swollen vein or dilate veins. Varicose veins, is the most common human vascular disease that affects about 10-20% of the population (Harrie and Kendall 2014). Varicose veins are veins long, dilated and twisted and is often seen at the interior surfaces of the lower limbs. The highest prevalence of varicose veins is estimated among women aged 40-49 years. Varicose veins are large, fully bulged and noticeable and sometimes palpable and dilated and elongated, and sometimes have more than 4 mm diameter. Swollen and spider web-like Varicose veins are very common (Harrie and Kendall 2014).

More than 40 percent of women over 50 suffer from the disease. Varicose veins are superficial veins, dilated and zigzagged due to structural defects and performance of the saphenous veins, or due to the inherent weakness of the vein wall or rarely due to Arteriovenous fistulas. More than 20

million adult Americans are suffering from varicose vein disease. The disease causes a feeling of illness or nausea and as a result reduces the normal functions of the patient (Chung, McCray et al. 2000). These veins are related to leg swelling, pain, dermatitis, phlebitis and ulcers. Patients with venous failure often complain of pain in their legs that worsen with prolonged standing and is relieved by elevating the feet. In the examination of shank diameter, edema of superficial varicose veins and erythema, dermatitis, hyperpigmentation can be seen in the lower leg and the skin near the external ankle might become ulcerous (Chung, McCray et al. 2000).

Varicose veins are mostly asymptomatic and only the aesthetic aspects require medical attention. If symptomatic, the pain, fullness and diffused non-specific heaviness are felt in the legs, especially after standing a long time. Sometimes swelling in the ankles and bulged vessels can be seen in the feet (Chung, McCray et al. 2000).

Avoiding long time standing or sitting position, avoiding long-time exposure of legs in the sun and heat or prolonged contact with garter or belt, avoidance of continuous wearing of strip (band) or stockings, avoiding simple sugars and lipids and the use of medications such as flavonoid derivatives, sodium morrhuate are among the methods of reducing the symptoms of varicose veins (Stiegmann, Sun et al. 1988).

Microneedling is a method recently used for skin diseases. Microneedling is a device for general skin needling which has a comparable impact with laser treatments and chemical peelings. This device can be used exclusively or as a complement to other treatment methods. . The disposable needles' points are short and tiny, it includes 12 microneedles that should be discarded after each treatment. For treatment, needle penetration depth must be between 25% to 2/5 mm set with a speed of 25 beats per second and beat for 90 beats per seconds which finally between 300 and 1,000 tiny holes in seconds are created in the surface. Microneedling is used to stimulate the skin to make natural collagen. Furthermore, treatment with this device helps penetration and absorption of drugs to the skin, skin rejuvenation and wrinkles, acne scars healing, improvement of body craze and the overall appearance of the skin and shrinkage of the size of the pores. Backlog and increasing the elasticity of the skin, new collagen production, surface and deep wrinkles reduction, improving crazes, and improving decrements of pigmented lesions' penetration ,materials, creams and vitamins to the skin after treatment with microneedling can be named as the advantages of microneedling (Van Stiegmann and Goff 1988).

Therapeutic approach for primary varicose veins is in the form of protection like keeping the leg up and bandaging in form of sclerotherapy and surgery (3).

The traditional method of varicose veins surgery involves cutting off the large saphenous vein at the junction of thigh or small saphenous vein at the junction of popliteal and then removing some specific branches of varicose veins. The procedure is performed under general or spinal anesthesia and has complications such as hematoma, infection and saphenous nerve damage. It is even possible that, according to the type of work, the patients are deprived of their jobs from 1 to 3 weeks (3 and 4). The recurrence rate in the method has been mentioned to be about 20 percent (5).

Now, for the treatment of varicose veins, alternatives methods have been proposed such as cutting intravenous (AP) in outpatient form. In this method, in addition to saphenous-femoral, prominent varicose veins are seen in the lower extremities while standing (this place is most likely the location of incompetent perforating veins).

Then through local anesthesia at the cut area, a few millimeters on the skin, varicose veins are tied off. This method seems to have fewer side effects, be more tolerable for the patient, and have good

results aesthetically (6 and 7). The aim of this study is to investigate and compare the effects of one period of micro needling on duration of hospitalization, duration of surgery, and postoperative complications in AP and ST surgery methods in the treatment of women with leg varicose.

### **Research hypotheses**

A 20-week period of microneedling has no significant effect on the treatment of women with varicose leg

A 20-week period surgical vein cut usage has no significant effect on the treatment of the women suffering from varicose legs.

## **MATERIAL AND METHOD**

### **Research Methodology**

The study population included all women with varicose veins in the age range between 40 to 60 years who have gone to health centers for treatment.

The sample consisted of a total of 30 diagnosed women, of those, 10 patients were randomly divided into a control group and two groups of 10 people will be selected as the experimental group.

After introducing the participants about the purpose of the study, in the first step, measuring pain intensity was performed using questionnaires. After the initial evaluation of samples, microneedling and surgical vein cut were used and conducted for 20 weeks and every four weeks for a total of 5 session meetings under the supervision of an expert. It should be noted that the research subjects must not have experienced the microneedling or the use of surgical vein cut, previously. Moreover, the use of any antidepressant medications during the study will be prohibited and any treatment with these drugs should be avoided for at least 7 days before the study begins. This study regarding the lack of any physical and psychological risks to the subjects will be approved by sports medicine and orthopedic specialists.

Subjects who were 30 patients were divided randomly into three groups equally. Group A: control group, including subjects who during the 20-week study did not have any therapeutic intervention. Group B and C, the experimental group who used microneedling and surgical vein cut for 20 weeks and a session for each 4 weeks and a total of 5 sessions.

In the present study to determine effects of microneedling and the surgical vein cut in two stages, mentioned indicators were measured regarding micro needling and the gel usage: one day before the beginning, and in the second phase one day after the 20-week period ends.

The subjects had to answer questions based on a Likert scale of 5 options. Each subscale separately and based on visual analog scale VAS were qualitatively determined.

## **RESULT AND DISCUSSION**

### **Surveying Normal Data Distribution in Microneedling Method**

To study the normal distribution of data Kolmogorov-Smirnov test was used. According to this test, distribution is normal when the amount is significantly higher than 0/05. The results are provided in table (1-4).

**Table (2-4). Kolmogorov-Smirnov test results for the variables before and after the test**

The significance level	Average and Standard deviation	Group		Variables
<b>0/44</b>	20/4±7/3	pre-Test	Control	Improvement
<b>0/31</b>	21/2±6/2	Post-Test		
<b>0/54</b>	19/1±3/2	Pre-Test	Experimental	
<b>0/21</b>	12/5±8/5	Post-Test		

Based on the results of Kolmogorov-Smirnov test, distribution data for all studied variables were normal. Therefore, statistical parametric tests were used for data analysis and hypothesis testing.

**A 20-week period microneedling has no significant effect on improvement of women with skin-deep varicose legs.**

To check this hypothesis, first and foremost, the statistical paired t-test (paired) were used to compare pre-test and post-test of each group (Table 2-4) and then t-test was used for comparison of independent groups (Table 2-4) at the significant level of  $P \leq 0.05$ .

**Table 3-4** paired t-test results of pretest and posttest

The significance level	t	Degrees of freedom	Within-group mean difference	Post-Test	Pre-Test	Group	Variable
0/089	1/72	9	1/3	21/2±6/2	20/4±7/3	Control	Improvement
0/001	7/11	9	7/4	12/5±8/5	19/1±3/2	Experimental	

**Table 4-4** independent t-test results in post-test

Two-tailed significance level	t	Degrees of freedom	The mean difference between groups	Variable
0/001	5/2	19	9/3	Improvement

Results showed that the experimental group in post-test after the exercise protocol in comparison to the pre-test, show significant difference in the pain, and pain in the experimental group were significantly reduced. But in the control group no significant difference was observed in the degree of pain in the pretest and post-test. Also according to the results from the table, in comparing the change in the groups in post-test, significant difference was observed between the changes. Therefore, the null hypothesis of no effect of 20 weeks of micro-needling on the improvement of the women suffering from skin-deep varicose leg is rejected and it can be stated that this type of intervention causes improvement in these individuals.

In this study, five patients were examined through ST and five patients through AP methods.

Table 1 shows assessment indices in the two groups. As can be seen, duration of surgery and hospitalization of patients in ST surgery is significantly higher than AP group.

**Table 1:** Mean and standard deviation of a group of indicators evaluated for patients undergoing outpatient vein cut surgery (AP) and extracting (ST) in the treatment of varicose veins

Surgery type	Age (year)	Surgery duration (minutes)	Hospitalization length (days)
AP	47.31±12.52	48.94±11.06	00.12±1.31
ST	42.79±12.71	84.16±22.34	2.83±1.02
p-value	P<0.05	P<0.001	P<0.001

Table 2 expresses the complications of surgical procedures used to treat varicose veins. The results of this table show that there are significant statistical differences between the complications of surgeries (hematoma, paresthesia and pain) between AP and ST groups.

**Table 2:** Comparison of surgery complications of vein cut surgery (AP) and extracting (ST) in the treatment of varicose vein

Surgery type	Hematoma		Paresthesia		Pain intensity			
	Positive	Negative	Positive	Negative	0	1	2	3
AP	1	18	19	-	13	6	-	-
ST	16	8	13	11	-	-	7	17
p-value	P<0.001		P<0.001		P<0.01			

### CONCLUSION

Microneedling by stimulating stem cells and fibroblasts in the skin does restorative work in the best possible way. Given the fact that in skin- deep varicose, the faulty veins are at the skin surface, 20 weeks use of microneedling stimulates the vascular and skin tissues and reduces complications of varicose veins and consequently results in its improvement. The results showed that the use of microneedling can be a safe and effective treatment in reducing pain in patients with varicose veins in lower limbs.

In this study, hematoma in AP surgery method was significantly lower than that of ST that can be due to less damage to vascular and subcutaneous tissues in AP method (8). Moreover, the incidence of paresthesias in AP surgery method was significantly lower than that of ST. In AP method, vessels are locally closed and due to less sense damage, paresthesia is associated with a lower incidence. Pain intensity was also significantly lower in AP group that is due to less tissue damage resulting from the surgical site in the AP method compare to ST.

Operation and time hospital stay after surgery in ST method were significantly more than that of AP that is inconsistent with the results of Eskavi (9) that has stated average time of hospitalization in both groups to be about 2 days. In this study, the average time of surgery in AP method was roughly the same as AP method in the study by Eskavi, but surgery duration in ST method was obtained 30 minutes longer than his findings. In our study, contrary to the findings of Alionsia (7), no thrombophlebitis or skin necrosis was observed. In his study, Ramlet (8) concluded that, AP factors are rare and depend on the indications of surgery and the skill of the surgeon.

According to the findings, it seems that AP method, because of fewer complications, shorter hospital stay, and less operation time, is a good alternative to ST (especially in elderly patients who have a high risk of unconsciousness). Moreover, concerning the cost level of patient satisfaction will lead to beneficial results for patients (10, 11).

According to what was said, studying the long-term effects of surgical procedures of ST and AP, especially in terms of recurrence in patients operated, requires further investigation.

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