Original Article (Araştırma Makalesi)

**Actual Practices in Diagnosis and Treatment of Venous Diseases by Using Veinviewer**

**Veinviewer ile Venöz Hastalıkların Tanı ve Tedavisinde Güncel Uygulamalar**

**Kısa Başlık:** Veinviewer

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**Abstract**

**Objective:** Veinviewer visualize peripheral vessels localized 8-10 mm deep under skin. This device can be used as a novel diagnostic and therapeutic assistant which provides chronoprofilaxy, cost reduction and comfort for patient and clinician. Thus, a prospective and randomized study was designed to assess versatility of Veinviewer in various applications.

**Method:** The study included overall 40 patients who referred to outpatient clinic. Group 1 patients underwent sclerotherapy with or without using Veinviewer. Group 2 patients underwent phlebectomy with or without using Veinviewer.

**Results:** It was seen that duration of the process was significantly reduced; and easiness of the process and patient quality of life were improved in the patients who underwent sclerotherapy via using Veinviewer (p<0.05). It was found that duration of the phlebectomy was significantly reduced; and convenience in the process of finding and removal of varicose vein were improved in the patients who underwent surgical varicose vein excision via using Veinviewer (p< 0.05).

**Conclusion:** It was detected that use of Veinviewer in sclerotherapy and phelebectomy, improved the comfort of patient and clinician, provided shorter and easier procedure and markedly contributed to effectiveness of therapy.

*Key words:*Veinviewer, phlebectomy, sclerotherapy

**Öz**

**Giriş**: Veinviewer deri altında yer alan 8-10mm. derinliğindeki periferik damarları görüntüleyen bir sistemdir. Bu cihaz venöz hastalıklarda, kronoprofilaktik, maliyeti azaltan, hasta ve hekim için işlem konforu sağlayan yeni bir diagnostik ve terapötik yardımcı olarak kullanılabilir. Bu amaçla, farklı uygulamalarda Veinviewerin çok yönlülüğünü değerlendirmek için prospektif, randomize klinik olan bu çalışma planlandı.

**Yöntem**: Bu çalışma polikliniğe başvuran toplam 40 hastayı kapsamaktadır. Grup I, skleroterapi yapılan toplam 20 hastayı kapsamaktadır. Grup II, flebektomi yapılan 20 hastayı kapsamaktadır. Bu hastalardan da on kişiye Veinviewer kılavuzluğunda, diğer on kişiye de Veinviewer kullanılmadan işlem yapılmıştır.

**Bulgular**: Veinviewer kılavuzluğunda skleroterapi yapılan hastalarda işlem süresinin anlamlı olarak kısaldığı (p<0.05), işlem kolaylığının ve hasta memnuniyetinin arttığı tespit edilmiştir.

Veinviewer kılavuzluğunda flebektomi yapılan hastalarda da flebektomi süresinin (p<0.05), ağrı görülme sıklığının önemli oranda azaldığı ve hasta memnuniyetinin arttğı tespit edilmiştir.

**Sonuç:** Venöz hastalıklarda tedavi uygulamalarından olan skleroterapi ve flebektomi işlemlerinde Veinviewer kullanımının; hekim konforunu, hasta konforu ve memnuniyetini artırdığı, işlemlerin daha kısa sürede ve kolaylıkla yapılmasını sağladığı, tedavideki etkinliliğe büyük katkılarda bulunduğu tespit edilmiştir.

*Anahtar Kelimeler:* Veinviewer, flebektomi, skleroterapi

**INTRODUCTION**

“Veinviewer” is a new system that visualizes peripheral vessels 8-10 mm deep under the skin. It performs a real-time image by using reflective near-infrared technology. With this new invention that makes visible the subcutaneous vessels which can’t be seen with naked eye by using infrared technology, now it is easy to localize these veins.

Infrared rays pass through skin and subcutaneous fat tissue easily. These rays are absorbed or transported in blood. Because of this, blood has a darker image, because their absorption is low in these tissues. However, skin and subcutaneous fat tissue has a brighter image. We planned this prospective and randomized clinical study to localize the veins in treatment of varicose veins and telangiectasia. We also planned to determine the versatility of Veinviewer in different practices.

**MATERIAL AND METHOD**

We got approval in Erciyes University Ethics Committee for this study. It includes two independent groups of totally 40 inpatient and outpatients of Cardiovascular Department clinics with informed consent. The patients will be compared with other patients in their own groups via time of procedure, pain (Visual Analogue Scale), repeat of the process in insufficient procedures and patient pleasure criteria.

Group I: Sclerotherapy performed patients:

IA- Veinviewer guided sclerotherapy performed patients: (n=10).

IB- Non-Veinviewer guided sclerotherapy performed patients (n=10).

GroupII: Phelebectomy performed patients:

IIA-Veinviewer guided phlebectomy performed patients (n=10).

II B- Non-Veinviewer guided phlebectomy performed patients (n=10).

Data were loaded and analyzed in SPSS 15 programme for Windows. Chi-Square Test, Independent Samples Test (T test) and Spearman Correlation Test were performed in statistical analyses. In these tests, p<0.05 value was accepted statistically significant.

**RESULTS**

After groups were compared in the study, statistically significant values are shown in Table 1 and Table 2.

**Table 1**. Sclerotherapy duration mean between Veinviewer guided and non- Veinviewer guided patients

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Veinviewer** | **t** | **p** |
| **Group1A (n=10)** | **Group 1B (n=10)** |
| **Time(sec) (mean ± standard deviation)** | 124 ± 25,0 | 160 ± 27,9 | 3,038 | 0,007 |

**Table 2.** Incidence of pain between Veinviewer guided and non- Veinviewer guided sclerotherapy performed patients

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pain +** | **Pain -** | **TOTAL** |
| **Number** | **%** | **Number** | **%** | **Number** | **%** |
| **Group IA** | 2 | 20,0 | 8 | 80,0 | 10 | 100,0 |
| **Group IB** | 9 | 90,0 | 1 | 10,0 | 10 | 100,0 |
| **TOTAL** | 11 | 55,0 | 9 | 45,0 | 20 | 100,0 |

Difference in duration time was found to be statistically significant between two sclerotherapy performed patient groups (p=0,007 The Independent Samples T test).

In sclerotherapy performed patients, incidence of pain in Group 1A is %70 less than Group 1B and this data is found to be statistically significant (p=0,02 Chi-Square test).

Difference in duration time was found to be statistically significant between two phelebectomy performed patient groups (The Independent Samples T test, p=0.001) (Table 3).

**Table 3.** Phlebectomy duration mean in Veinviewer guided and Non-Veinviewer guided Phlebectomy performed patients

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Veinviewer** | **t** | **p** |
| **GroupII A (n=10)** | **GroupII B (n=10)** |
| **Time(sn) (mean± std. deviation )** | 135,5 ± 37,6 | 183,0 ± 44,6 | 3,640 | 0,001 |

Difference in incidence of pain was found to be statistically significant between two phlebectomy performed patients ( p=0,02 Chi-Square test ) (Table 4)

**Table 4.** Incidence of pain in Veinviewer guided and Non-Veinviewer guided phlebectomy performed patients

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pain +** | **Pain -** | **TOTAL** |
| **Number** | **%** | **Number** | **%** | **Number** | **%** |
| **Group IIA (n=10)** | 1 | 10,0 | 9 | 90,0 | 10 | 100,0 |
| **Group IIB( n=10)** | 7 | 70,0 | 3 | 30,0 | 10 | 100,0 |
| **TOTAL** | 8 | 40,0 | 12 | 60,0 | 20 | 100,0 |

**DISCUSSION**

Telangiectasias with feeding vessels are localized too deep to be seen with naked eye, and too superficial to be determined with ultrasonography. Telangiectasias cannot be determined by using ultrasonography because of the collapse in them.

VVP (Veinviewer Project) is not only used for drawing blood sample from thin vessels and giving intravenous medications but also for visualizing the feeding vessels in an appropriate way for the diameter and depth (1). This device is accepted totally non-harmful and also used for determining venous flow or reflux.

The image must be focused and the angle between skin and device must be appropriate to get optimum benefits from VVP device. The captured image is seen broad darker than normal venous image.

Patients who are healthy and admit to a physician with cosmetic concerns should be treated in aesthetically oriented. In such conditions, esthetic treatment should have reliable techniques.

This device is first developed for difficulties during vascular access in patients and children. In a study performed in Cardinal Glennon Childrens Health Center, Veinviewer was shown to be successful for vascular access with fewer attempts. In the same study, it was also detected that patients had less pain during procedure by using Veinviewer (2).

In 2006, another study was published in the Journal of American Society for Dermatology Surgery. Phlebological patients treated by using Veinviewer were compared with patients treated without using Veinviewer. Sclerotherapy and phlebectomy were performed in these patients and it was detected that Veinviewer guided treatment caused better patient comfort and higher treatment efficiency when compared with naked eye treatment (1).

In our study, when we compare two different patient groups who had sclerotherapy and surgery, Veinviewer applied patients ( Group 1A and 2A) had less incidence of pain than non-Veinviewer applied patients (Group 1B and 2B) and this difference is statistically significant.

In a study of University of Tennessee, differences between ultrasound and Veinviewer were analyzed in vein sizes and depth. In the study, a perfect correlation was detected between vein depth and Veinviewer visualization. Better images were captured in superficial veins. Using contrast in vessels with larger diameter gave more significant results by Veinviewer. On the contrary, a linear correlation was detected between diameter and depth of the veins. Furthermore, it was detected only in fewer amounts of veins of arms. No significant relation was found between diameter and depth of the veins in sample size of this study (2).

This device helps easy vascular access in the first attempt to the veins with low blood flow (3).

During such procedures performed with naked eye, undesirable effects may occur as pain in patient, infection risk because of the many times repeated procedures, injuries of nerves close to vein walls, waste of time for patient and health employee and high treatment costs.

In our study; for each group of 20 patients sclerotherapy or phlebectomy were performed, we detected shorter mean of procedure time and lower incidence of pain in patients that Veinviewer used than patients who Veinviewer not used. These differences are found to be statistically significant.

Veinviewer can be used in vascular surgery; sclerotheraphy, control after sclerotherapy treatment, endovenous laser, phlebectomy, venous mapping, congenital vascular malformations (for treatment approach in venous malformations ) .

**Conclusion**

Further research powered for the particular clinical settings and patients in which the near-infrared light technology might add a distinct benefit should be conducted for this potentially promising technology. Future studies, using the next-generation device, may be better able to evaluate the usefulness of near-infrared light in obtaining vascular access. When considering easy use and benefits of Veinviewer, it is a necessary device in terms of physicians and patient comfort.

**KAYNAKLAR**

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