

CHALLENGES IN THE REFLUX ABLATION IN A PATIENT WITH CHRONIC VENOUS LEG ULCER – CASE REPORT

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ABSTRACT

Introduction: Venous leg ulcer is a severe health problem for patients with a long history of venous hypertension. The treatment includes invasive procedures including both surgical removal of insufficient veins and their intravenous ablation. The latter technique, although often used especially in patients with refractory or recurrent ulceration, sometimes encounters difficulties that reduce the chances of its success.

Material and methods: In a patient with a 30-year history of venous ulceration due to insufficient saphenous vein, intravenous laser ablation was performed due to the inability to heal the ulcer for a long time with various forms of conservative treatment.

Results: Within a few weeks of the surgery, the venous ulcer was effectively healed. After 8 months, recanalization of the proximal section of the great saphenous vein, connecting with the varicose veins of the thigh, leg and venous plexuses in the area of the ulcer, was found, but without the accompanying opening of the wound. Despite the constant use of compression therapy by the patient, about a year after the procedure, the ulcer reopened. Next, sclerotherapy of the insufficient great saphenous vein trunk as well as varicose veins was performed, resulting in the wound healing again.

Conclusions: The procedure of intravenous ablation of insufficient venous trunks is an effective form of venous ulcer treatment. However, in order to maintain a long-term positive effect of treatment, it is advisable to eliminate all sources of venous insufficiency as early as possible and carefully monitor the patient at all stages of therapy.

Key words: venous insufficiency, sclerotherapy, venous ulcer, endovenous laser ablation.

CASE REPORT

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INTRODUCTION

Venous leg ulcer (VU) is one of the most advanced stages of chronic venous disease (CVD), diagnosed in a significant number of the patients. The treatment of VU is a complex, time-consuming and costly task that requires coordinated and disciplined cooperation between health-care providers, the patient, and the patient's family. Although conservative management is the main way of treatment in patients with venous leg ulcer, surgical treatment plays an increasingly important role in the therapeutic approach. According to the results of the ESCHAR study, surgical treatment aimed at reducing venous hypertension in the superficial venous system significantly reduces the risk of recurrence of venous leg ulcers [1]. In this study patients were randomized to a group treated with standard therapy, including compression therapy, or to a group in which surgery in the superficial veins was additionally performed. However, no effect of the surgical treatment on the improvement of ulcer healing results was observed. Technological progress and the development of minimally invasive treatment methods, as well as the recently published results of the EVRA study, have

significantly changed the approach to CVD surgical treatment [2]. According to the results of the study, early surgical treatment of venous insufficiency using minimally invasive methods of reflux ablation in the superficial vein system, combined with compression treatment, increases the healing rate and speeds up the process. The possibility of using a minimally invasive procedure not only creates a chance to cure the patient, but also potentially reduces the risk of treatment complications. Although the EVRA study proposes surgical treatment early after ulcer diagnosis, surgical ablation of superficial veins with venous hypertension can also be successfully performed much later. This undoubtedly creates a chance to cure patients with a long-lasting VU or with ulceration resistant to the current treatment (recalcitrant ulcer). This paper is a case report of a patient in whom conservative treatment of VU did not bring the desired effect and it became necessary to undergo surgical treatment without full wound healing.

MATERIAL AND METHODS

A 70-year-old patient came to our center for the first time in 2019. The patient manifested an extensive scarred

area covering about half of the circumference of the left leg, including the active ulcer area behind the medial ankle (Fig. 1). VU has been present since the first half of the 1990s, and the first symptoms of CVD in the form of varicose veins observed by the patient appeared around the age of 20. From the onset of the disease, the patient had multiple episodes of superficial vein thrombosis of varicose veins in the leg, thigh and left great saphenous vein (GSV). For over 20 years, venous ulcers were treated with exudate-absorbing dressings and compression therapy in the form of 2-degree compression stockings and periodically short-stretch bandages. VU was successfully healed several times, but, despite continued use of compression therapy, VU recurred. The last episode of active VU lasted for 12 months, with a 1 x 3 cm wound during the initial meeting and substantial accompanying effusion. The patient was transferred to our center from another phlebological clinic where he was treated conservatively with short-stretch bandage application, but with no progress in terms of healing of VU for about a half of the year.

Additionally, the patient had a long history of hypertension and atrial fibrillation that was treated with rivaroxaban. Obesity was among other aggravating factors. In the past, the patient did not undergo any surgical procedures, such as removal of varicose veins of the lower extremities.

During the first visit, the patient presented with active VU behind the medial ankle of the left lower limb with serum effusion. On the medial side of the leg there was a large scar covering most of its medial side, and most of its circumference was affected with lipodermatosclerosis-type trophic changes. The patient had severe swelling of both lower limbs in the proximal area of the feet, ankles, and legs. In addition, very large varicose veins were visible in the upper part of the leg, the knee area and the lower part of the thigh. The patient did not report pain from the ulcer, although he complained of periodic itching of the skin around it. The patient's ankle-brachial index (ABI) was measured without any signs of left lower limb ischemia, and a Doppler ultrasound examination of the lower limb venous system was performed.

In ultrasound examination, the deep venous system of the left lower limb presented no signs of thrombosis, no post-thrombotic changes and all veins of the deep system were competent. GSV was insufficient from the level of the femoral saphenous junction (FSJ) down the entire length of the thigh to about the middle level of the leg. In the femoral segment, the GSV width was up to a maximum of 15–17 mm (with two segmental widenings up to 23 mm). Inside the vein for most of its length on the thigh and leg, post-thrombotic changes were present, taking the form of thick (up to 4 mm) connective tissue partitions reaching the area of the FSJ (Fig. 2). At many levels, the vein wall thickened. The insufficient branches of the GSV were present in the lower thigh and the upper part of the leg and most of them were varicose veins. Numerous varicose veins with signs of venous insufficiency were present in the leg (Fig. 3), reaching the area of VU (Fig. 4). The small saphenous vein was efficient with no post-thrombotic changes and with no connections to insufficient leg varicose veins.

The patient was instructed to use foam dressings to absorb effusion, to continue using short-stretch Rosidal K Lohmann & Rauscher bandages applied from the foot up to the groin with two layers of bandages, and was provided with endovenous laser ablation (EVLT). The procedure was carried out on 11.2019. A laser with a wave-



Fig. 1. Ulceration before treatment



Fig. 2. Great saphenous vein post-thrombotic partition



Fig. 3. Great saphenous vein and varicose veins

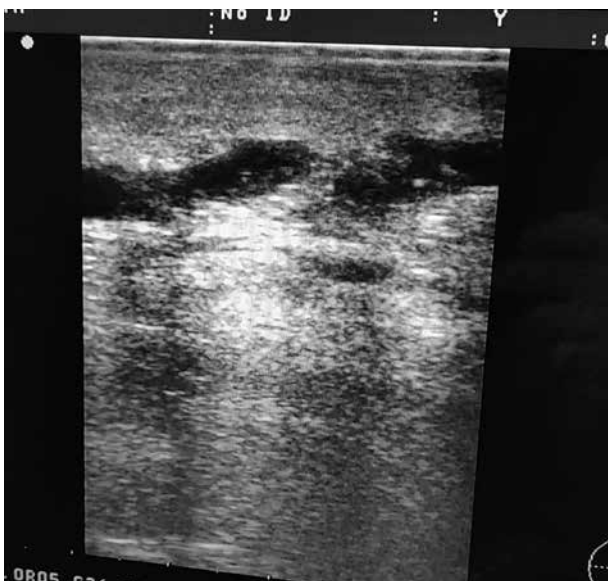


Fig. 4. Venous plexus below the ulceration

length of 1470 nm and one ring laser wire was used. Due to the intraluminal, post-thrombotic changes, two places for the venous access to GSV had to be used: mid-thigh and mid-calf. The ablation with one ring laser fiber was started 1 cm below the FSJ. Tumescent anesthesia (TA) was performed and GSV ablation with energy of 150 J/cm was carried out (Fig. 5–7). Total energy used was 5750 J. Immediately after the procedure, the patient was instructed to use compression stockings in the 2nd degree of compression and return to the short-stretch bandages afterwards.

RESULTS

The first follow-up visit took place 7 days after the procedure and it was noted that the effusion subsided, and the size of the ulcer decreased (Fig. 8). In ultrasound examination the GSV was successfully occluded in the whole femoral section and down to the puncture site. Another follow-up visit took place 30 days after the procedure, when the patient presented a healed area of VU.



Fig. 6. Laser ablation



Fig. 5. Wire positioning

Additionally, a slight regression of lipodermatosclerosis and varicose veins was observed. In ultrasound examination the GSV was obstructed, filled with mixed-echogenic interior with dominance of hyperechoic tissues. Due to the healing of the ulcer and the patient's lack of consent to further surgical treatment at this stage, the surgical treatment of residual varicose veins in the lower limbs was abandoned, and further follow-up visits were recommended. After another 8 months, the local condition of the limb presented as previously, the ulcer was still healed (Fig. 9), but the ultrasound examination revealed partial recanalization of the proximal GSV section at a length of about 20 cm down to the level of the wide venous branch connecting with varicose veins in the knee and upper part of the leg. The proximal part of the GSV was 8–12 mm wide, with signs of insufficiency, and it contained numerous partitions as well as organized thrombus. Below that section the GSV was still successfully obstructed. The patient was recommended to continue applying compression therapy – 2nd degree compression stockings. Due to the morphology of the changes in the proximal part of the GSV, the patient was not qualified for thermal ablation, as it was highly probable that it would not be possible to pass a guidewire or a probe through it.



Fig. 7. Operation site



Fig. 8. Seven days after endovenous laser ablation



Fig. 9. Eight months after endovenous laser ablation

Moreover, a hard-wall vein is poorly compressible, which would make TA harder to perform. After talking with the patient, sclerotherapy was also abandoned at this stage. Another follow-up was performed one year after the primary surgery due to the reopening of the ulcer behind the medial ankle with active effusion (Fig. 10). Ultrasound examination revealed as previously an insufficient

20 cm proximal section of the GSV with fibrotic partitions and wall attached hyperechogenic thrombi, as well as varicose veins in the thigh and leg, connecting with insufficient venous branches that joined the patent proximal section of the GSV. The lower part of the GSV with sectionally thickened wall presented hyperechoic thrombus. Foam dressings were used for the ulcer locally, and



Fig. 10. One year after endovenous laser ablation



Fig. 11. One and a half years after endovenous laser ablation and 6 months after sclerotherapy

the form of compression was changed, as previously, to short-stretch Rosidal K Lohmann & Rauscher bandages applied from the foot up to the groin with two layers of bandages. The patient was scheduled for further treatment with ultrasound-guided sclerotherapy. Sclerotherapy of varicose veins of the thigh and leg (2% polidocanol, foam) departing from the proximal insufficient section of GSV with closure of the very proximal section (3% polidocanol, foam) was performed. After the procedure, the effusion from the ulcer was reduced. In the next stage, foam sclerotherapy (1% polidocanol) was performed on the venous plexuses present under the ulcer, leading to their closure and complete healing of the ulcer (Fig. 11). A one-month follow-up after sclerotherapy revealed healing of the VU, completely obstructed GSV, obstructed GSV venous branches, and obstructed varicose veins in the thigh and leg. The patient was provided with dedicated UlcerX compression products and continuous follow-up was recommended.

DISCUSSION

VU treatment is a complex and usually multi-stage process. As mentioned in the introduction, the key task for achieving therapeutic success is the correct application of various forms of therapy, both conservative and interventional, at the right time [3]. Due to the multitude of possible techniques and the lack of unified guidelines, many patterns of therapeutic approach have developed. Most doctors treating VU agree that the necessary element of any treatment is the use of proper compression therapy and even if it is possible to heal VU without its usage, the effect is short-lived [4]. In the discussed case, compression was used at every stage of treatment, but despite the initial use of short-stretch bandages, it turned out to be insufficient, and the patient had recurrences of VU. Of course, as in any case of VU lasting many years, the question remains as to the correctness of the application of this type of compression, as well as whether the patient is following the recommended therapy during remission of the ulcer.

The case discussed in the article confirms the legitimacy of considering surgical treatment in patients with VU due to venous insufficiency, not only in patients with previously diagnosed ulceration (EVRA policy) but also in patients with refractory or recurrent VU.

According to clinical observations and research data, patients with VU are characterized not only by a variety of clinical presentations, but also the variety of pathology found in the ultrasound examination. The most common disorder is superficial vein insufficiency (74–93%) with or without concomitant deep vein pathology. According to the literature, isolated superficial vein insufficiency can be found in 17–54% of patients with VU, and isolated lesions limited to the deep vein system in only 10% of these patients [5–10].

Considering such prevalence of superficial vein insufficiency in the population of patients with VU, it is advisable to look for patients who can potentially benefit from surgical treatment, especially since the currently proposed minimally invasive treatment significantly reduces the potential risk of complications of the operated site. The present case was related to the insufficiency of the post-thrombotic GSV as well as the development of varicose veins in the thigh and leg. According to the results of the ultrasound examination, the patient was scheduled for EVLT as the first step of treatment. Despite the technical difficulties related to the treatment of the post-thrombotic GSV, its closure allowed the VU to heal, unfortunately, as it turned out later, only temporarily.

The further clinical condition of the patient, including the recurrence of VU due to recanalization of the proximal segment of the GSV, suggests the need for careful monitoring of patients undergoing treatment of venous insufficiency, especially in its advanced cases, with the risk of recurrence of VU in mind. The most likely cause of partial (proximal) recanalization of the GSV in the subject was most likely post-thrombotic changes inside the GSV, which reduce the chances of therapeutic success of ablation mainly for two reasons. Firstly, connective tissue partitions and wall clots cause that, regardless of the factor used during ablation, it does not affect equally effectively, or does not affect at all, the vein wall in places where post-thrombotic changes are present. Secondly, post-thrombotic veins are characterized by reduced flexibility, which significantly reduces the effectiveness of TA and its ability to contract the vein on the ablation catheter. For the same reason, the success of surgical methods is also hindered. It is because post-thrombotic veins are more fixed within the subcutaneous tissue, and due to a decrease in their elasticity, their fragility increases, which does not allow long sections of the vein to be removed from access through the usually used small skin incisions.

Venous leg ulcer recurrence caused by the recanalization of the GSV proximal segment and the reappearance of reflux within the unremoved network of veins in the thigh and leg also indicates the need for the most radical elimination of reflux in this group of patients already during the primary procedure. After the GSV was closed the VU healed, and as the condition of the limb satisfied our patient, further surgical treatment was discontinued. The clinical course in such cases, however, suggests the validity of treatment aimed at the elimination of all potential sources of reflux leading to the area of VU. The final closure of the ulcer was achieved after the obliteration of the segmental recanalization of the GSV, its insufficient branches as well as the varicose veins of the thigh and leg with a network of veins directly under the VU. It should be emphasized, however, that also in this situation it is justified to conduct further careful observation of the patient.

CONCLUSIONS

Ablation of superficial vein insufficiency increases the possibility of healing of VU. To avoid recurrences, it is necessary to carefully monitor the state of the patient's venous system as well as to perform treatment aimed at eliminating all sources of reflux that may be a potential cause of VU.

The authors declare no conflict of interest.

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