

## Venous ulcer treatment with autologous stem cell

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Özen Y, Cekmecelioglu D, Günay D, et al.. Venous ulcer treatment with autologous stem cell. J Phlebol Lymphol. 2018;11(1):1-2.

Chronic venous insufficiency ulcer (CVIU) is a pathology developing due to the venous pathologies, and it is not recovered for long time despite the treatment, consequently decreases the quality of life and leads to economic problems. Proven treatment methods of this disease, which has been

known for a long time, are the compression therapy and the treatment of venous pathology, while the efficiency of other methods either have been found to be limited or could not be proven due to the studies on small patient groups. Stem cell therapy, which is widely used nowadays and efficiency-proven, was implemented to a patient having chronic venous insufficiency ulcer.

Key Words: Venous ulcer, Stem cell, Stasis

### CASE PRESENTATION

72 year-old female patient applied with the complaint of wound discharge in her right leg, which has not healed for 5 years. Despite the fact that she has used double-layer compression socks for last 1 year, the wound has not healed. In physical examination, the findings were significant increase in diameter of right lower limb in proportion to other leg, 2 ecchymosis in diameters of 15 cm and 5 cm under the knee joint in posterior and anteromedial regions, and surficial skin ulcer with serous discharge in the middle (Figure 1). The distal pulses were palpable, and obvious redness and increased local temperature were observed below the knee joint. When examined with Doppler ultrasound (USG), besides the normal arterial circulation, grade 4 reflux in VSM (vena saphenous magna), SFV (superficial femoral vein) and CFV (common femoral vein) in mentioned extremity and 11 mm of VSM diameter were observed. Because of the venous insufficiency ulcer and venous pathology, VSM ablation via variclose method and subcutaneous injection of stem cells around the wound region were applied in same session. Stem cells are picked up within bone marrow aspiration and applied to subcutaneous tissue directly. After the intervention, 4-layer elastic bandage used for compression for 48 hours and then the treatment of 2-layer compression stocking were applied. Follow up of the wound showed an extremely well prognosis. We observed distinct difference between first and fourth week physical examinations as shown in Figure 2 and 3 respectively.

### DISCUSSION

CVIU is a disease affecting 1% of the society. Its prevalence increases with the increase in mean lifetime of humans and the increase in smoking habits and obesity. CVIU's characteristic is to show no sign of healing for 3 months despite the appropriate treatment or no completion of healing process within 12 months. This situation leads to a significant decrease in quality of lives of patients, and causes economic problems. Furthermore, if these ulcers are not treated, they may lead to deep tissue infections and malignancy [1]. For these reasons, CVIU is a disease that must be treated.

Many treatment methods have been tried in order to treat CVIU. The most known treatment method is the compression application that is known as conventional treatment. Compression is implemented in different ways, and 4-layer bandage treatment and 2-layer compression stocking have been reported to be superior to other compression methods [2,3]. Despite the positive outputs, there also are factors limiting the compression implementation. Those are arterial circulation pathologies, pains due to compression, and necrosis developing due to unsuccessful implementation of compression. We implemented 2-layer compression stocking therapy for our patient after the treatment.



Figure 1: Venous ulcer.

In order to treat the underlying venous pathology, the implementation of ligation, ablation and stripping of superficial or perforator veins are discussed in surgical topic. In studies, it has been determined that the applied methods were not superior to each other [4,5]. It has also been found that the surgical intervention in addition to the compression therapy didn't offer significant contribution to the healing of CVIU but only decreased the recurrence rate. In our patient, the existing VSM pathology was treated with variclose method.

Although almost 80% of acute venous ulcers heal, this portion is about 22% in chronic venous ulcers despite the treatment for 6 months [6]. And

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Received: January 2, 2018, Accepted: January 16, 2018, Published: January 20, 2018



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this requires additional therapies and interventions in addition to conventional treatments in chronic venous ulcers.



**Figure 2:** First week of the treatment.



**Figure 3:** 4<sup>th</sup> week of the treatment.

Among the pharmacological therapies implemented to date, aspirin, micronized purified flavonoid fraction (MPFF) and mesoglycan have not

been sufficiently proven to have contribution for the treatment. Although pentoxifyline has been found to be useful in ulcer treatment, the medical interactions and the side effects of the medicine limits the usability [7]. There is limited number of studies on use of bioengineering-product for skin care, but many products have not been found to be suitable for routine usage. Only skin graft has been found widely use of area because of its easy feasibility. But unfortunately, due to the persistent tissue edema developing secondary to underlying venous pathology, the implementation of skin graft couldn't reach the enough efficiency [4].

Stem cell therapy has been reported to have promising outputs in wounds developing due to different underlying etiologies; those have not healed for a long time. Successful applications of stem cell therapy in diabetic foot ulcers have been reported, but there is limited number of literature data on implementation for ulcers which developed due to venous pathologies [8,9]. In studies, it has been reported that, besides transformation of stem cells into connective tissue elements and repairing the deficit structures; stem cells have been reported to significantly contribute to the healing of wounds through increasing the cell reproduction, collagen synthesis and growth hormone secretion and stimulating the contraction of wound edges and the neovascularization [3,4]. For these reasons, we implemented stem cell therapy for our patient having chronic venous insufficiency ulcer. At the end of therapy, we observed significant in wound healing besides the easier treatment of wound infection. That is why; we believe that the stem cell therapy might have positive effects on chronic venous insufficiency ulcers.

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