CASE REPORT

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Cutaneous Leukocytoclastic Vasculitis with Necrotic Lesion in a Patient Followed with the Diagnosis of Pulmonary Embolism Caused by COVID-19

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ABSTRACT The patient, who was followed up for pulmonary embolism due to coronavirus disease-2019 and had eschar-shaped lesions resembling peripheral circulatory disorders and different from the skin involvements mentioned in the literature, had normal angiography images and could not walk. He also had aspegillus infection of the lung and diffuse emphysomatous lesions in 2 lung lobes. In addition to anticoagulant therapy, steroid, immuran and plaquonil treatment was continued for a long time. Amputation was previously recommended due to chronic wounds; with a multidisciplinary approach, first epidermis graft transplantation (cellulotome) and then micro graft (Punch graft) was performed. The patient was discharged on foot after 15 months.

Keywords: Pulmonary embolism; vasculitis

Aspergillus may be seen as a co-infection in coronavirus disease (COVID) patients under corticosteroid treatment. In influenza B infections (H_1N_1) virus infections, 19% was reported. Viral infections increase comorbidity in steroid-treated patients.[1] Leukocytoclastic vasculitis has been detected in patients with a wide range of findings including generalized purpuric eruptions, vesicular rashes, maculopapular lesions, occlusion and livedo and necrotic lesions indicating vascular disease.[2]

CASE REPORT

The patient was informed that the case data would be published and a consent form was obtained. A 33-year-old refugee male patient was followed for pulmonary embolism and had skin lesions resembling peripheral circulatory disorders**.** Pulmonary computed tomography (CT) angio revealed "pleural effusion, ground glass densities, nodular consolidations, varicose bronchiectatic appearances and filling defects consistent with embolism in the upper lobar branch of the right main pulmonary artery and in the lobar and segmentary branches of the left main pulmonary artery". The patient was unable to walk. Peripheral CT angio images were normal. Aspergullus infection was detected in lung bronchial lavage. Blood pressure was low, 80/40 mmhg. Inotropic support was started. Anti-coagulant (low molecular weight heparin was ordered. 1 mg/kg/day 2x1) was administered subcutaneously. Intravenous

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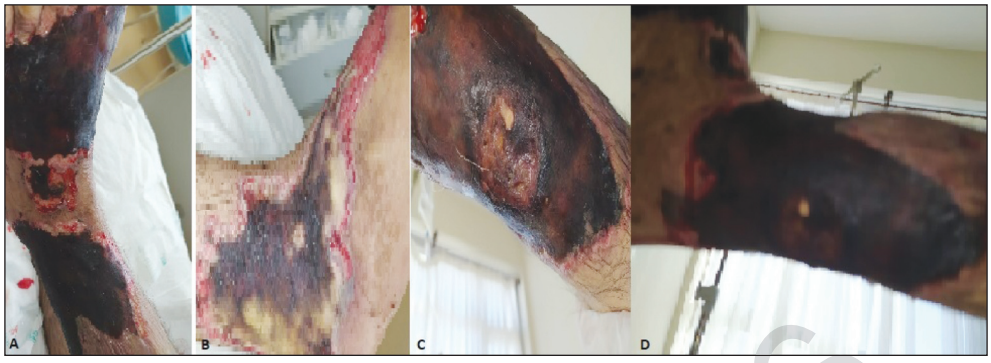

FIGURE 1: Necrotic Skin Tissue with Eschar Appearance; **A)** Right foot, **B)** Left foot, **C)** Right leg, **D)** Left leg

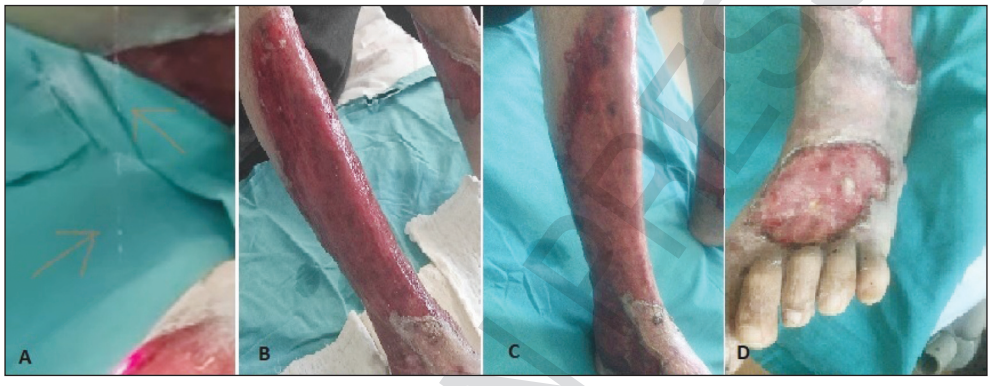

FIGURE 2: Spincare technology is aimed at developing a microscopic nanofiber material Electrospinning Healing Fibers (EHF™) that provides wound protection and tissue regeneration. It allows patients to continue their lives while healing. **A)** Spincare, **B)** Before application, **C)** 1 week after application **D)** 2nd week after

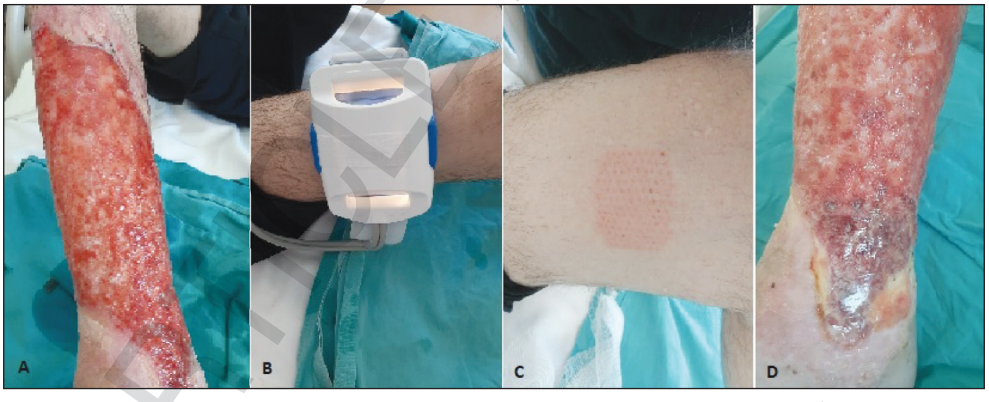

FIGURE 3: Celluloteme **A)** Before the prodecure, **B)** Cellulotome applicator, **C)** Donor area, **D)** 1st week.

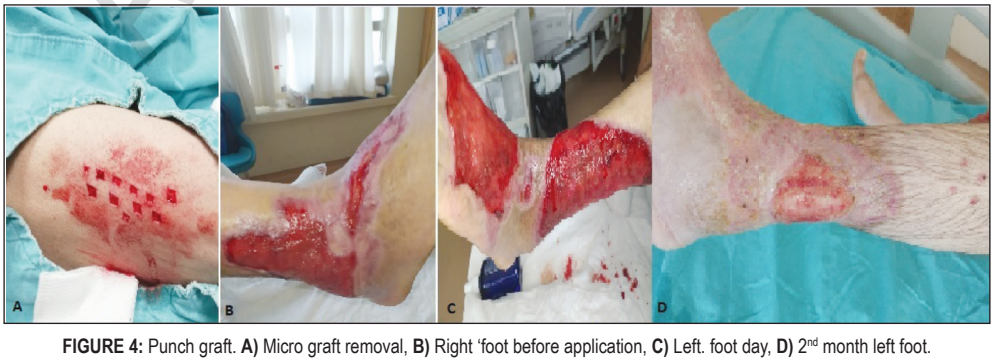

FIGURE 4: Punch graft. **A)** Micro graft removal, **B)** Right 'foot before application, **C)** Left. foot day, **D)** 2nd month left foot.

loading of 70 mg/m^2 capsofungin was performed for 1 hour for aspergullus and an additional 50 mg/m^2/day was given. Although the warfarin dose was increased, international normalized ratio (INR) did not reach therapeutic values. Warfarin was discontinued and enoxiparin was continued. C-reactive protein (CRP) values started to decrease on the 3rd day. Inotropic support was discontinued with an exercise program. Drug Marketing Authorization Holder (DMAH) treatment continued continuously and pulmonary embolism started to regress in the 2nd month. Sarcopenia was stopped with protein-based nutrition support. The patient was put on passive physical therapy program and started to walk with bandages. Black necrotic escar tissues in both lower extremities were debrided. Culture was sent. Skin biopsy was taken. Cutaneous leukocytoclastic vasculitis was reported. Steroid, immurane, caspofungin and plaquonil treatment was continued for a long time besides anti-coagulant treatment. He received regular wound care treatment. Klepsiella grew in the wound site for 4 months. Low pressure instillation wound closure treatment was applied. Antiseptic solution containing hypochlorous acid was used for washing. The patient felt very severe pain during dressing. The frequency of dressing was reduced. In recent years, a number of studies have been published on the successful use of topical sevoflurane in vascular ischemic ulcers.[3] Sevoflurane, used as a tender anesthetic in the operating room, provided rapid, intense and lasting pain relief. It reduced the use of other traditional analgesic drugs and enabled wound cleansing without adversely affecting wound healing. Being a public hospital made it difficult to access this drug. Wound care was continued with collagen and hyaluronic acid sprays. Polyurethane coating knitted spin care was applied. Chronic ulceration of the lower extremity is a common problem that does not always respond to local care. Skin grafting is widely accepted in such cases. The patient and the patient's relatives refused to apply a full thicness graft. Epidermis cell transplantation (Cellulotome) was not successful in our patient. The advantages of punch graft were explained. In a study, a study combining full thickness grafting, punch grafting and Negative Pressure Wound Therapy (NPWT) in the reconstruction of plantar defects after melanoma surgery was described. Punch grafting was reported to give better scar results. This reveals the importance of functional and aesthetic units during grafting. It was emphasized that punch grafting and NPWT reconstruction should be the first choice for weight-bearing areas.[4]

After the wound bed with appropriate granulation tissue developed, the wound sites started to close with Punch graft application. The patient was followed up in the hospital for 15 months and discharged on foot with recommendations.

DISCUSSION

Spike glycoprotein was documented immunohistochemically in all coronavirus disease-2019 (COVID-19)-related involvements. Pathophysiologically, 3 main pathways have been described: activation of alternative and mannan-binding lectin pathways, T cell and Type 1 interferon-induced inflammation by secretion of IL 6 from the endothelium, and Humeral-induced immune system.[5] Another study, pauci-inflammatory thrombogenic vasculitis was defined.[6] In another patient, vasculitis presented with vesicular findings.[7] Leukocytolastic vasculitis was reported after vaccination with accumulation of immune complex deposits in small vessels.[8] With COVID-19, 6 phenotypes showing basic skin manifestations were defined; urticarial, maculopapular, papulovesicular, childblain-like, livedo reticularis/racemosa-like, purpuric vasculitic-like. Skin findings appear between 1.8% and 20.4% of COVID-19 patients.[9] After vaccination, Ig A vasculitis (Henoch Schönlein), lymphocytic vasculitis, ANCA-associated vasculitis, leukocytoclastic vasculitis, urticarial vasculitis, immune complex vasculitis were defined.[10] Punch biopsy results reported fibrinoid collection in the vascular wall, neutrophilic infiltration, perivascular lymphocytic, histiocytic, eosinophilic, neutrophilic infiltration and leukocytoclasia.[11] In a patient with peripheral arterial disease, vasculitis manifested itself with extensive skin necrosis and he died due to multiple organ failure.[12] In another study, skin necrosis, ulceration and livedo retucularis vasculitis were reported in large and medium vessel vasculitis due to COVID-19 and vaccines. In our patient, no large or

medium-sized vessel involvement was observed, but there was widespread skin necrosis.[13] It has been reported that the mechanism of immune thromboembolism in vasculitis with autophagosome proteins LC3B and LC3C in microvascular endothelial cells with diffuse spike protein accumulation is due to endothelial damage.[14] In a study conducted in patients with cutaneous leukocytoclastic vasculitis, Platelet Lymphocyte Ratio (PLR), Neutrophil and Lymphocyte Ratio, CRP Albumin Ratio, Fibrinogen Albumin Ratio values were examined and a significant change was found only in PLR values.[15] In our patient, traditional wound care, dressings, local and systemic immune suppressive therapy were applied. Because of the poor wound bed, skin graft was not initially considered. Due to the pathergy phenomenon the use of skin grafting in atypical ulcers is limited. A multidisciplinary approach to similar wounds is required. Median healing time for atypical wound ulcers using conventional wound care has been found to be shorter than those treated surgically. Multiple comorbidities have a negative impact on wound healing. Although topical or systemic glucocorticoids are used, skin grafting should be considered in ulcers with delayed healing and wounds suffering from severe pain and recurrent infections. The simplicity of application of the punch graft, its minimal invasiveness, the fact that it does not require special equipment and surgical experience, and the good quality scarring of the wounds on the correct granulation have made the micrograft preparation method preferred in large or complex wounds. We applied this method in our patient. Epidermis cell transplantation (cellulotom) was not successful in our patient.

In conclusion, it is stated that patients suffering from cutaneous leukocyto-clastic vasculitis, which has been widely mentioned in the literature, do not have lesions similar to our case, only in a case with peripheral arterial disease, a patient who presented with necrotic skin tissue had his legs amputated and the patient died of multi-organ failure. Although our patient had comorbidity factors such as young age, pulmonary embolism, aspergillus, emphysema and inotropic support, cachexia and immobility, multidisciplinary approach triggered the treatment. We have shown that vasculitis with extensive chronic skin necrosis but not impaired peripheral circulation does not require single amputation.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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