Case of Non Healing Chronic Venous Ulcer Healed after COVID-19

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Abstract

Background

Chronic venous insufficiency with edema, skin changes, and ulceration indicates advanced chronic venous disease. Active venous ulcers usually heal with proper wound care and surgical treatment of underlying venous abnormalities. However, ulcers associated with obstructive venous pathology, incompetent perforators, and varicose veins often heal poorly or recur frequently. The association between venous ulcer progression and COVID-19 is poorly understood.

Case Report

We report a case of a 55-year-old female with a chronic non-healing venous ulcer, venous hypertension, and varicose veins, whose ulcer healed following COVID-19 infection. This improvement is suspected to be related to COVID-19-associated coagulability (CAC).

Conclusion

This case suggests that COVID-19 infection may influence the healing of chronic venous ulcers, potentially through alterations in coagulation pathways, warranting further investigation.

Keywords: *Case report, COVID-19, Deep Vein Thrombosis, Sclerotherapy, Venous ulcer.*

Introduction

Venous leg ulcers are responsible for 60-80% of the leg ulcers and are prevalent among 0.18-1% of the general population.[1] Non healing venous ulcers are common in cases of deep vein thrombosis, varicose veins, chronic venous insufficiency and are associated with significant morbidity affecting quality of life.[2] Treatment for venous ulcers includes compression therapy, leg elevation, pharmacotherapy and surgical treatment[3] Here, we report a case of improved prevailing venous ulcer following COVID-19 infection. This manuscript has been reported according to SCARE 2020 criteria.[4]

Case Report

A 55-year-old female presented to the outpatient department with a history of improvement of prevailing venous ulcer in 2 weeks time following infection with COVID-19. She was diagnosed with symptomatic familial Deep Vein Thrombosis (DVT) fifteen years back with history of bilateral lower limb swelling with DVT involving common femoral vein, superficial femoral vein and popliteal veins on both the sides. On examination for the past thirteen years, she had bilaterally prominent dilated veins in lower leg along with a non healing ulcer in the inner aspect of right leg just above the ankle joint.

She has been taking warfarin regularly since the last fifteen years with dose adjusted to maintain International Normalized Ratio (INR) 2-3.

Radiological investigations were sent and the imaging revealed bilateral secondary varicose veins with multiple incompetent lower leg perforators. She had two surgical procedures involving ligation of incompetent perforators along with two sessions of targeted sclerotherapy. The ulcer is deep with irregular border and clear watery discharge. The skin around the ulcer shows purple pigmentation (figure 1).

Figure 1. *Chronic venous ulcer on the medial aspect of the right ankle.*

However, the ulcer showed no signs of healing for 7 years despite daily dressing, multiple layered bandaging and sclerotherapy. These procedures helped for some symptomatic improvement in terms of pain and discharge from ulcer but the ulcer had never healed for seven years.

She had a mild COVID-19 infection six months back and was treated at home. The symptoms resolved in a week. However, in follow-up after a month of COVID-19 infection, her ulcer surprisingly started healing. The ulcer appeared shallow with irregular borders and the overlying wound bed has yellow fibrinous exudate formation with no discharge (Figure 2). Her other symptoms. due to ulceration like discharge and pain had also subsided. Doppler ultrasonography revealed thrombosis of all the tributaries under the ulcer.

Discussion

Venous ulcers usually present as a sequelae of Deep Vein Thrombosis (DVT), varicose veins, perforator or muscle pumping insufficiency of the lower limb.1,5,6 There are superficial and deep veins; drainage from deep vein is facilitated by perforator vein and pump action of calf muscles.5 The calf muscle pump with good dorsiflexion of the index leg and a higher percentage of volume of blood displaced are the potential protective factors of ulceration.[5]

Figure 2. *Healing venous ulcer on the medial aspect of the right ankle.*

Damage to both calf muscle and perforator veins can lead to venous pooling of blood which leads to venous hypertension and ulceration later on.[5] Incompetent venous reflux or venous obstruction also causes increased permeability and leakage of hemosiderin in the skin changing its texture and elasticity.[6]

The risk factors for development of venous ulcer include advancing age, family history of venous diseases, physical inactivity and/or history of prolonged standing, obesity, previous thromboembolic events, DVT, high estrogen state, varicose veins and factor V Leiden mutation.[1,7] Larger wounds, ulcer duration of >1 year, fibrin in >50% of wound surface, history of venous ligation are the poor prognostic factors to this disease.1 While venous ulcers present as a sequelae of DVT and varicose veins, incidence of concomitant DVT and varicose veins is rare.[8] No cases of concomitant DVT and varicose veins have been reported in association with venous ulcers in Nepal to our knowledge. Furthermore, the role of COVID-19 in regard to the course of the venous ulcers has not been explored yet.

The patient in our case is an elderly female with DVT and varicose veins with a family history of venous disease (DVT), all of which are associated with risk of developing venous ulcer. Additionally, the venous ulcer had persisted for seven long years and had no signs of healing suggesting poor prognostic characteristics.

Venous ulcers predominantly occur in the lower third of the leg around the medial malleolus also known as gaiter's area.[2,9] This finding was consistent with our case, where the patient has venous ulcer on the right gaiter region.

Venous thromboemboli are the most frequently occurring thrombotic event in COVID-19. Endothelial inflammation, breakdown of intercellular junction and the production of microthrombi are all distinct microvascular anomalies in COVID-19.[10] A meta-analysis of 42 studies involving 8271 patients showed that overall venous thromboembolic events rate was 21%, and DVT rate was 20% among SARS-CoV-2 infected patients; severely infected ones being at higher risk.[11]

A case control study among 241 people aged 40 to 99 years estimated people who had a diagnosed thrombo-embolism were at almost three times higher risk of having a leg ulcer.[12] Robertson, et al. in a case control study of 240 people estimated that patients with varicose veins (most common in great saphenous vein followed by short saphenous vein), chronic venous insufficiency and deep vein incompetence are at greatly increased risk of ulceration.[5]

Treatment options for venous leg ulcers include compression therapy, leg elevation, medications(Pentoxifylline, aspirin) and surgical treatment(debridement, skin grafting) among which compression therapy is the standard of care.[3] General patients diagnosed with DVT with venous ulceration have ulcer healing in about 80% within 24 weeks following appropriate treatment.[13] Nelzen et al. concluded that the overall ulcer healing for patients with varicose veins treated conservatively was about 60% at 5 years in his prospective cohort study among 382 participants 14 However in case of venous ulceration due to concomitant DVT and varicose veins, ulcer healing is exceedingly rare despite adequate management.[8]

In our case, she had a history of symptomatic DVT (familial and recurrent), bilateral secondary varicose veins along with non healing ulcers for thirteen years. Despite intervention and adequate compression therapy, her ulcer hasn't healed for thirteen years. However, her ulcer started healing following COVID-19 infection. Venous ulceration was at stage C6 before she contracted COVID. After COVID, the ulcer started to heal and turned to stage C5.

Thrombosis as a result of SARS CoV2 infection in the veins underlying venous ulcer might have eliminated the processes responsible for recurrent discharge from the ulcer. The discharge usually is rich in proteolytic enzymes causing proteolysis of growth factors that was required for healing. The removal of discharge might have reduced the proteolytic activity enhancing the growth factors function and thereby, healing the venous ulcer.[15]

Conclusion

Venous ulcers associated with Deep Vein Thrombosis (DVT) and varicose veins, despite appropriate management, are linked with delayed healing. Moreover, literature suggests that the venous thromboembolic pathology of COVID-19 infection is associated with poor prognosis of venous diseases.11. Contrary to this, the patient in our case had a remarkable healing of the venous ulcer from stage C6 to C5 post COVID-19 infection.

Consent

Written informed consent was obtained ensuring patient's anonymity.

Conflicts of Interest

There are no conflicts of interest.

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