An Unusual Case of Pulmonary Embolism in a Patient with Psoriasis: Highlighting the Association between Psoriasis and Pulmonary Embolism

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Highlights
Psoriasis is a common immunoinflammatory disease and studies have demonstrated that psoriasis patients have an increased risk of thromboembolic events. We present an unusual case of pulmonary embolism (PE) in a patient with recurrent and poorly controlled plaque psoriasis and review the pathophysiology and diagnostic considerations. This case highlights the importance of having clinical awareness of occurrence of PE in patients with psoriasis.

Keywords: Pulmonary embolism, Psoriasis, Thromboembolic events

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Introduction
Psoriasis is a common chronic immunoinflammatory disease affecting approximately 2% of the population. Clinical data have convincingly demonstrated that psoriasis patients have an increased risk for developing cardiovascular disease and an increased risk of thromboembolic events. We report a unique case of a patient who suffered from both psoriasis and subsequent pulmonary embolism (PE). The magnitude of the associated PE in this case is one of the aspects that makes it unique and draws attention to the association between psoriasis and PE.

Case Report
A 45-year-old Chinese male of Han ethnicity who had been previously diagnosed with poorly controlled and recurrent plaque psoriasis for the last 8 years and on topical treatment with betamethasone cream presented with a chief complaint of dyspnea and shortness of breath on exertion for the past 2 months. The shortness of breath and exertional dyspnea were deteriorated 3 days prior to admission and was accompanied with dry cough. He also reported swelling and fatigue in his left lower extremity for the past week. He denied fever, chill, hemoptysis, wheeze, palpitations, chest pain, or syncope. He denied any recent surgery, immobilization, bed rest, long distance trips, active cancer history, or smoking history. The psoriasis had spread during the last 2 weeks and covered the majority of his lower extremities.

On presentation, the patient had a temperature of 36.5°C. His blood pressure was 125/80 mm Hg, heart rate was regular and at 80 beats/min, respiratory rate was 30 breaths/min, and oxygen saturation on room air was 90%. Physical examination revealed well defined psoriatic plaque lesions on the trunk and bilateral lower extremities as well as non-pitting edema to the level of the popliteal fossa in his left lower extremity (see Figure 1). Cardiovascular, respiratory, digestive, and nervous system examinations were unremarkable.

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His laboratories revealed a normal complete blood count and normal electrolytes. Serial troponin were negative as well as brain natriuretic peptide (BNP), D-dimer: 1488.29 ng FEU/ml (normal range < 500 ng FEU/ml). ANA (antinuclear antibody) and Anti-dsDNA (anti-double stranded DNA) assays were negative, and titers for Anti-Smith antibody, beta-2-microglobulin, and cardiolipin were within normal limits. Echocardiography was performed and revealed significant right ventricular strain due to clot burden. He had a moderately enlarged right ventricle as well as moderately reduced systolic function. Lower extremity Doppler color ultrasound revealed evidence of acute deep venous thrombosis in the left common femoral vein, superficial femoral vein, and popliteal veins. A computed tomography pulmonary angiography showing extensive pulmonary emboli, left greater than right (Figure 2), and a small, left pleural effusion and left lower lobe airspace disease likely representing a pulmonary infarction. Electrocardiogram (ECG) revealed sinus rhythm at 80 beats/minute and T-wave inversion in leads V1-6.

The patient was diagnosed with deep venous thrombosis, PE and psoriasis. He was treated with 5000 IU of low molecular weight heparin per 12 hours subcutaneously and warfarin orally. The dose of warfarin was adjusted according to the international normalized ratio (INR).

The patient’s symptoms resolved after treatment as well as the edema of left lower extremity. Warfarin was continued to maintain the blood INR value between 2 and 3 after discharge. His psoriasis has continued to be treated with topical steroid creams and his care has been followed-up closely.

Discussion

Venous thromboembolism (VTE) encompasses deep vein thrombosis and PE. It is the third most frequent cardiovascular disease with an overall annual incidence of 100-200 per 100 000 inhabitants. The epidemiology of PE is difficult to determine because it may remain asymptomatic, or its diagnosis may be an incidental finding; in some cases, the first presentation of PE may be sudden death. Overall, PE is a major cause of mortality, morbidity, and hospitalization in the worldwide

This is an unusual case of a patient with no other risk factors of PE aside from recurrent and poorly controlled plaque psoriasis who subsequently developed deep venous thrombosis. Psoriasis is no longer viewed as an isolated dermatological disease and instead is considered a systemic immunoinflammatory disease. This condition is characterized by autoimmune dysregulation and systemic inflammation. Venous thrombosis complicating psoriasis has been recorded in medical literature in 19145. Since then, however, subsequent observational reports impressed upon the increased incidence of thromboembolic disease seen in psoriasis. Some studies demonstrated that being diagnosed with psoriasis increased the risk of venous thrombosis and embolism by as much as 40%

The pathogenesis is still uncertain, and varied hypothesis and contributing phenomenon have been queried and linked to the occurrence of VTE in psoriasis. Studies showed that common inflammatory cascades play critical roles in the initiation and maintenance of psoriasis and VTE, including activation of antigen presenting cells and macrophages. Psoriasis patients have significant inflammation not only in
the skin, but also subclinical inflammation in the liver, joints, tendons and vascular tree even after adjusting for traditional cardiovascular risk factors, suggesting that psoriasis itself predisposes to pro-inflammation pathways independent of traditional risk factors. Others have suggested a more direct hypothesis that psoriasis-initiated skin and systemic inflammation cause insulin resistance, which promotes endothelial cell dysfunction, subsequent atherosclerosis and ultimately thromboembolic events. It had been demonstrated that sustained skin-specific inflammation promotes inflammation and thrombosis and suggest that aggressive treatment of skin inflammation may attenuate pro-inflammatory and pro-thrombotic pathways that produce thromboembolic events in psoriasis patients.

In psoriatic patients, the occurrence of new onset typical but non-specific symptoms of VTE such as chest pain, shortness of breath, oedema, sudden onset headache, vision impairment should raise the suspicion of possible VTE as PE, deep vein thrombosis, inferior vena caval occlusion, cerebral venous thrombosis and central retinal vein occlusion. Similarly abdominal pain and swelling in a psoriatic patient could point toward the consideration of a rare yet probable occurrence of portal vein thrombosis. Though psoriasis is now recognized to be associated with PE, it is still an uncommon occurrence, and this may have led to the delay in both presentation and diagnosis.

This case highlights the importance of having clinical awareness of occurrence of PE in patients with psoriasis. Typical symptoms and signs favoring PE should prompt thorough investigation to exclude this rare yet possible complication in patients with psoriasis. Prophylaxis with anticoagulation still lacks strength of evidence to be justified in psoriasis. The exact pathogenesis of PE in patients with psoriasis is still unexplained and further studies are needed to clarify the causal association.

Declarations of Interest

The authors declare that there is no conflict of interests

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We thank the patient who participated in this research. Ethics approval: The authors assert that all procedures contributing to this work comply with the Helsinki Declaration of 1975, as revised in 2008, and has been approved by the institutional committees (the Ethics Committees of Dongguan Affiliated Hospital of Medical College of Jinan University and the Fifth People’s Hospital of Dongguan). Written informed consent was obtained from the patient.

The authors state that they abide by the statement of ethical publishing of the International Cardiovascular Forum Journal.

References