Platelet-rich plasma injections and the development of cutaneous sarcoid lesions: A case report

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INTRODUCTION

Sarcoidosis is a systemic disorder characterized by noncaseating granulomas that most commonly affect the lungs but may also affect the skin, lymph nodes, joints, and eyes. Skin manifestations of sarcoidosis can occur at sites of cutaneous injections with foreign materials including tattoos, insulin injections, and cosmetic fillers.[1] We report the first case of cutaneous sarcoid lesions developing at nonforeign material injection sites in a patient who received platelet-rich plasma (PRP) therapy with no previous history of injections with foreign materials.

CASE REPORT

A 62-year-old Chilean woman with a medical history of uveitis presented with a 3-year history of firm asymptomatic nodules on her face (Fig 1) and right shoulder (Fig 2). These lesions developed at injection sites 4 months after PRP treatment for a right rotator cuff injury as well as injections in the supraciliary region, nasolabial folds, bilateral cheeks, and upper lip for cosmesis.

Ultrasonography found granulomas distributed throughout the injected regions. Punch biopsies from 2 sites found chronic inflammatory processes with foreign body sarcoid granulomas (Fig 3). At this time, PRP injections were stopped. Two years later, repeat soft tissue ultrasonography showed an increase in the number of nodules, 35 on the face and 5 on the right shoulder.

Abbreviation used:

PRP: platelet-rich plasma

The patient denied fevers, dyspnea, fatigue, loss of appetite, night sweats, unintentional weight loss or gain, edema, cardiac issues, or systemic symptoms. General laboratory studies, including complete blood count, comprehensive metabolic panel, urine analysis, lipid profile, and serum angiotensin-converting enzyme were within normal limits. QuantiFERON and herpes simplex virus serology were negative.

On chest computed tomography, multiple symmetric lymph nodes were found in the mediastinum. The patient had an endobronchial ultrasound on 2 hilar and 1 subcarinal lymph nodes, all of which were negative for pathologic conditions. Lymphoid elements were found in different stages of maturation with fibro hyaline nodules consisting of noncaseating granulomas, suggestive of sarcoidosis. In February 2019, the patient refused any form of treatment, and the lesions remained stable. In September 2019, the patient agreed to receive intralesional corticosteroid injections, which yielded little response. The patient recently started on oral corticosteroids and is being followed up for response.

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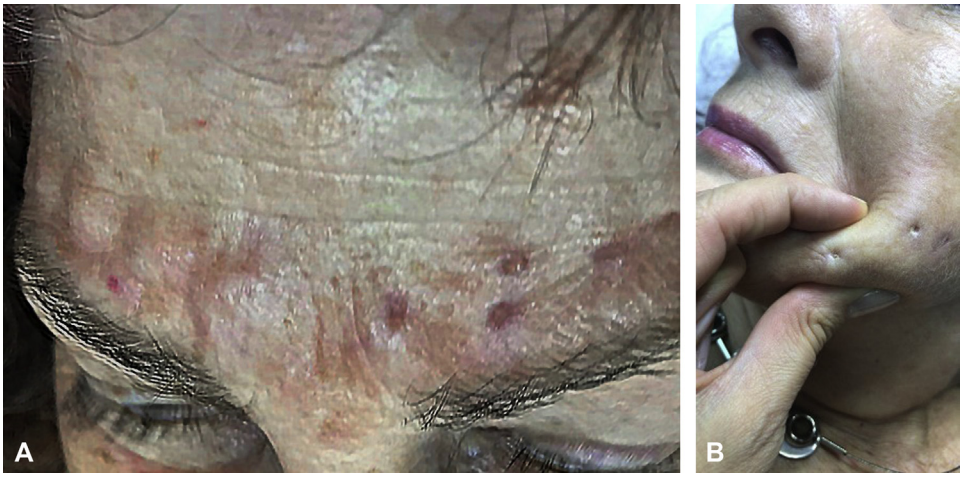

Fig 1. A, Well-defined reddish-brown erythematous plaques and nodules in glabellar and superior brows bilaterally. **B**, Multiple punctate ulcers with extrusion of xerotic keratinized substance on the jawline.

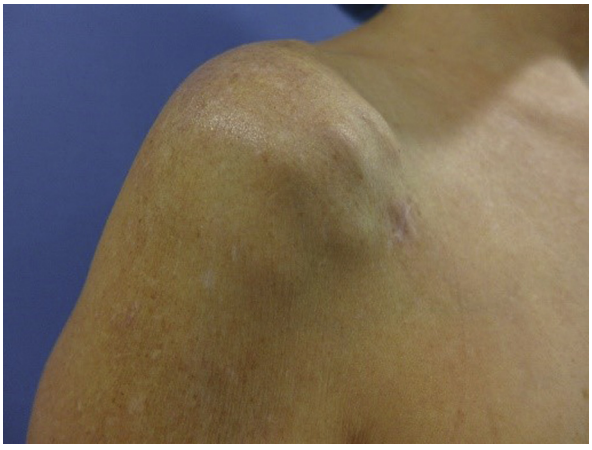

Fig 2. Multiple pink erythematous plaques and flesh-colored subcutaneous nodules on the right shoulder.

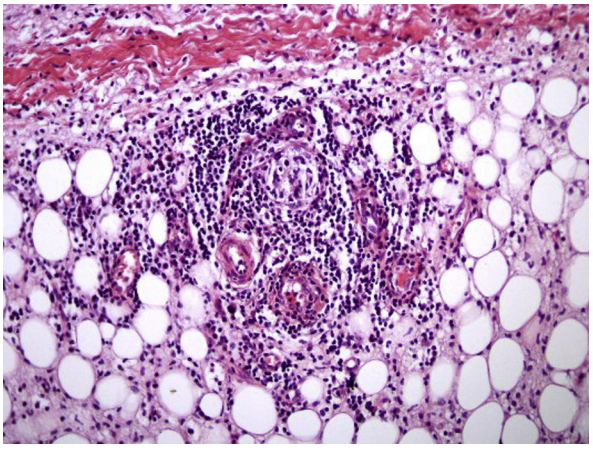

Fig 3. Noncaseating epithelioid granulomas with surrounding perivascular lymphocytic infiltrate. There is an extension of infiltrate into the deep subcutaneous space. No evidence of vasculitis.

DISCUSSION

We describe a patient who had sarcoid lesions at sites of PRP injections. This case produces important clinical concerns about the use of PRP in patients with sarcoidosis. We hypothesize that skin trauma elicited a Koebnerization phenomenon that led to cutaneous sarcoid lesions.

Compared with whole blood, PRP is an autologous plasma that contains an increased platelet concentration. PRP injections have been beneficial in many dermatologic applications and are often used for skin rejuvenation procedures.[2] Additionally, PRP has been used as an adjuvant treatment to augment musculoskeletal tissue healing.[3]

Serizawa et al[4] describe a case of a 68-year-old Japanese woman who had sarcoid skin lesions after treatment with PRP. In addition to PRP treatment, however, this patient had a history of receiving hyaluronic acid and botulinum toxin injections. The introduction of foreign material, such as silica and hyaluronic acid, has been reported previously to trigger cutaneous sarcoidosis.[5] They suggest that injections of PRP may lead to the stimulation of growth factors and the activation and migration of monocytes, which trigger the formation of cutaneous sarcoid granulomas.[6]

In contrast to the case by Serizawa et al,[4] our patient received PRP injections only, having no previous history of injections with foreign substances. Although Serizawa et al suggests a link between PRP and granuloma formation, we speculate that the formation of sarcoidosis at PRP injection

sites is caused by the skin injury from the injection itself; a Koebnerization reaction.

Cutaneous sarcoidosis develops at sites of skin trauma.[7] Chesner et al[8] describe a case of a patient with cutaneous sarcoidosis who was treated with broadband light therapy. The patient developed bullae, which triggered a Koebnerization response, leading to the formation of new sarcoid plaques. We hypothesize that skin trauma secondary to PRP injections triggered the formation of cutaneous sarcoid lesions in our patient.

An important clinical consideration in our case is whether the patient had subclinical sarcoidosis prior to PRP treatment. She had a medical history of uveitis, years before the PRP treatment was initiated. Uveitis is found to be the most common ocular manifestation of sarcoidosis and is present in 20% to 50% of sarcoidosis patients. Patients may also present with ocular sarcoidosis in the absence of any other systemic involvement.[9] Given the patient's history of uveitis, we believe that the patient had systemic sarcoidosis that was previously undetected.

Topical or intralesional corticosteroids are first-line therapy for localized and mild sarcoidosis limited to the skin.[7] Oral corticosteroids are the drug of choice for rapidly progressive or topical therapy-unresponsive lesions. Treatment is not necessary for all patients with sarcoidosis, as the disease can remain stable or spontaneously remit, and the effect of organ involvement may not justify the risk of drug-induced complications. As well, patients with inadequate responses to corticosteroid therapy are candidates for systemic treatment with antimalarial drugs, methotrexate, or tetracyclines.

Because of the complicated nature of the disease and the wide range of symptoms with which sarcoidosis can present, there is unfortunately no single test for the diagnosis or exclusion of sarcoidosis. In patients who present with symptoms concerning for sarcoidosis, further evaluation may be warranted before proceeding with PRP injections. Bronchoscopy with biopsy remains one of the most common procedures for detection of granulomas.[10] In our case, biopsy from facial lesions as well as endobronchial ultrasound scan with needle aspiration found noncaseating granulomas, confirming a diagnosis of sarcoidosis.

CONCLUSION

This case report should caution physicians about the use of PRP injections in patients with active sarcoidosis. Appearance of new sarcoid lesions at sites of PRP injections may be suggestive of a Koebnerization reaction to the injection itself. If sarcoidosis is suspected in patients considering PRP treatment, further investigation including bronchopulmonary evaluation of lesions may be warranted to differentiate the type of granulomas present, prior to proceeding with PRP.

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