Cutaneous polyarteritis nodosa with clinical features of pyoderma gangrenosum

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INTRODUCTION

Cutaneous polyarteritis nodosa (cPAN) is a vasculitis of medium-sized vessels with typically unknown etiology and a varied clinical presentation making the diagnosis elusive. Here, we describe a unique presentation of cPAN mimicking the clinical appearance and behavior of pyoderma gangrenosum.

Abbreviations used:

BD: Behcet disease
cPAN: cutaneous polyarteritis nodosa
PAN: polyarteritis nodosa

CASE REPORT

A 49-year-old white female smoker with a history of intravenous drug use and chronic hepatitis B complicated by early cirrhosis presented to the emergency room for painful ulcers on her right third finger and right second toe. She reported a 4-year history of recurrent spontaneous, painful black nodules, which would ulcerate and then heal with scarring. She had been treated with multiple rounds of oral and intravenous antibiotics for presumed infections without resolution. Review of systems was significant for subjective fevers, occasional aphthous ulcers, nonspecific eye redness, morning stiffness, and weight gain. She denied genital ulcers, fatigue, chills, photosensitivity, and leg cramps on exertion.

Physical examination found an afebrile woman in no acute distress, with tender papules on the right dorsal third finger (Fig 1, *A*) and right first and second toes. There were tender, stellate-shaped plaques with underlying indurated-to-firm discrete nodules on her bilateral thighs (Fig 1, *B*), right forearm, and left elbow. Cribriform scarring was present on the left posterior lower leg. Evaluation of conjunctivae and sclera were normal.

Her liver transaminase levels were slightly elevated consistent with her known liver cirrhosis, but otherwise her comprehensive metabolic profile and complete blood count values were within normal limits. Hypercoagulability and autoimmunity panels were all normal including cryoglobulin, cryofibrinogen, rheumatoid factor, anticardiolipin antibody, β-2 glycoprotein antibody, lupus anticoagulant screen, cytoplasmic antineutrophil cytoplasmic antibodies, and perinuclear antineutrophil cytoplasmic antibodies, and protein C and S. Laboratory studies were significant for elevated erythrocyte sedimentation rate and C-reactive protein of 22 mm/h and 0.7 mg/dL, respectively. Her viral load of hepatitis B was 33,479,494 copies/mL.

Magnetic resonance imaging of the right hand showed nonspecific arthritis of the third proximal interphalangeal joint without evidence of septic arthritis or osteomyelitis. Magnetic resonance imaging of the right foot showed mild skin irregularity over the second toe, interpreted as focal cellulitis. However, blood cultures and right foot and finger tissue cultures had no growth. Transesophageal echocardiogram did not find evidence of an interatrial shunt or valve vegetation. Given her history of eye symptoms, the ophthalmology department was consulted; no ocular condition including uveitis or vascular pathology was found.

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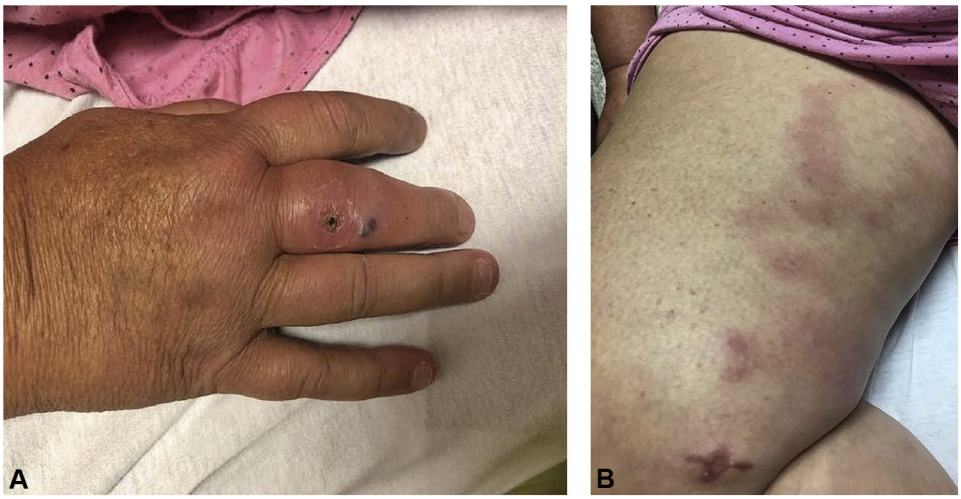

Fig 1. Cutaneous polyarteritis nodosa: Presentation. **A**, Hemorrhagic crusted papule with background soft tissue erythema and edema on the right dorsal third finger at presentation. **B**, Subcutaneous nodules on thighs.

A punch biopsy was obtained from a purpuric papule on her right third finger. The day after biopsy, there was profound pathergy, creating a pyoderma gangrenosum-like lesion (Fig 2, *A*). Histopathology testing found a dense neutrophilic dermatitis with vasculitis, and near-complete obliteration of a medium-sized arteriole in the reticular dermis (Fig 2, *B*).

Based on histopathology, lack of criteria to meet diagnosis for Behcet disease (BD), negative tissue cultures, and absence of systemic involvement, a diagnosis of cPAN was made. Prior to immunosuppression, she was instructed to start tenofovir, 300 mg/d. One week later, she started on a 3-week oral prednisone taper, starting at 0.5 mg/kg/d, in addition to colchicine, 0.6 mg twice daily, and topical clobetasol 0.05% ointment twice daily. Three weeks later, her disease flared and she re-started prednisone, 0.5 mg/kg, colchicine, 0.6 mg/d, and azathioprine. Six weeks later, the patient was re-admitted because of worsening pain and decreased functionality of the right third finger. Because of the severe arthritic changes seen on imaging, poor wound healing, and chronicity, the patient unfortunately underwent amputation of the finger.

DISCUSSION

cPAN, like systemic polyarteritis nodosa (PAN), is a predominantly neutrophilic vasculitis of medium-sized arteries in the reticular dermis and subcutaneous tissue.[1] Proposed diagnostic criteria include cutaneous manifestations with correlated histopathologic findings in the absence of systemic symptoms to distinguish from PAN.[2] Consistent with these criteria, our patient demonstrated purpura, ulcerations, and tender recurrent subcutaneous nodules on the lower extremities as evidenced by the patient's postinflammatory hyperpigmentation.[3,4] Although no pathognomonic laboratory values exist for cPAN, our patient had a slightly elevated erythrocyte sedimentation rate and a negative perinuclear antineutrophil cytoplasmic antibodies, consistent with 60% and 80% to 90% of patients respectively.[3-5] Our patient presented with arthritic changes to the third proximal interphalangeal joint, which progressed to destructive arthritis. Arthralgias occur in up to 69% of patients with cPAN and can progress to arthritis confined to the area of skin involvement as in our patient.[5,6]

Our patient had several risk factors for the development of cPAN. In a cohort of 79 patients, cPAN was found more commonly in women than men (1.7 to 1) and the average age of patients with ulcers was 47 years.[4] Although hepatitis B is more commonly associated with systemic PAN, a few cases of hepatitis B–associated cPAN have also been noted in the literature.[7,8]

A unique finding of our case was the pyoderma gangrenosum–like evolution of one of the papules after biopsy of the lesion. Ultimately based on the caliber of vessel, degree of inflammation, and fibrinoid necrosis present, the histopathology supports the diagnosis of primary vasculitis, seen with cPAN, rather than secondary vasculitis as seen with pyoderma gangrenosum. To the best of our knowledge, there is only 1 prior case reported in which a patient in whom pyoderma gangrenosum was initially diagnosed and was later found to have systemic PAN after biopsy.[9] cPAN-like lesions have been described in association with BD. However, our patient had less than 3 aphthous ulcers per year,

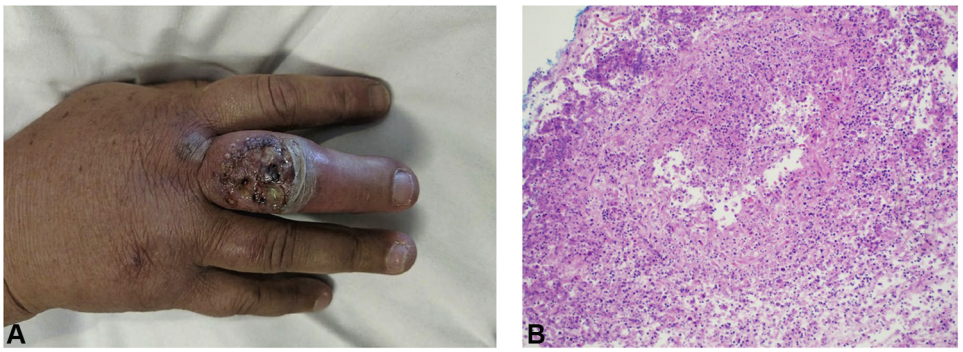

Fig 2. Cutaneous polyarteritis nodosa: biopsy and histology. **A**, Subsequent change in appearance of the right dorsal third finger after punch biopsy into a pyoderma gangrenosum—like lesion, characterized by a large ulcer with a granulating base and a pseudo-undermined grey-to-erythematous border. **B**, Hematoxylin-eosin stain of punch biopsy of right third finger shows near-complete obliteration of a medium-sized arteriole and dense neutrophilic infiltrate. (Original magnification: ×200.)

no ocular findings, and no reactions at her intravenous sites making true pathergy less likely; therefore, our suspicion of BD was low.

Treatment for cPAN includes the use of topical or intralesional corticosteroids for limited disease, systemic corticosteroids for extensive disease, and nonsteroidal anti-inflammatory drugs for symptomatic relief.[3] cPAN is difficult to control and often requires longer courses of prednisone and steroid-sparing agents such as colchicine.[3,4] A recent study of 22 patients with cPAN found that pretreatment ulcers and elevated C-reactive protein are both risk factors for relapse.[10] Delayed diagnosis and the inability to reduce severity of the flares resulted in prolonged skin, soft tissue, and joint damage leading to amputation of the affected digit. Therefore, early recognition is critical to control symptoms and prevent prolonged patient morbidity.

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