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Diagnosis of an Annular Rash in an Adult with Multiple Risk Factors: A Case Report

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Abstract

Introduction: With a wide variety of associated diseases, proper diagnosis and treatment of annular rashes can prove clinically challenging.

Case Report: A 53-year-old male presents with a painful, purpuric, annular eruption in addition to multiple risk factors for systemic diseases. An extensive in-patient work-up yielded a suspected diagnosis of IgA-vasculitis despite an atypical presentation.

Conclusion: A differential diagnosis for an annular eruption may include cat scratch disease, DRESS syndrome, IgA-vasculitis, among multiple other causes. It is essential to remain vigilant of atypical presentations of disease and to complete a comprehensive history, physical, and workup to ensure optimal patient care.

Keywords: ***Annular rash; IgA-vasculitis; Cat scratch disease; DRESS syndrome; Henoch Schönlein purpura***

1. Introduction

Severe annular lesions-plaques, macules, nodules, or pustules with a ring-like morphology-have been documented in over 30 distinct diseases and disorders. With a wide differential inclusive of both isolated cutaneous disease and systemic disease, proper diagnosis and treatment of an annular rash can prove challenging for clinicians. Extreme variability in symptomology further complicates the diagnostic process [1]. In this report we describe the unique case of a 53-year-old gentleman who presented with a progressing annular rash in the setting of multiple risk factors for systemic diseases. While his initial presentation was concerning for cat scratch disease (*Bartonella henselae* infection) or drug reaction with eosinophilia and systemic symptoms (DRESS) syndrome, thorough evaluation suggested a nonclassical presentation of IgA vasculitis (IgAV).

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This report will discuss the difficulty in diagnosing and treating annular eruptions and review current literature regarding the epidemiology and presentation of associated disorders.

2. Case Presentation

2.1 Day 1: Patient assessment

A 53-year-old Caucasian male presents to the Emergency Department for evaluation of a painful rash on his bilateral lower extremities. He believes the eruption started two months prior, around the time he adopted two stray kitchens which he notes, "like to scratch him." At that time, the lesions appeared as mildly erythematous, linear scrapes for which his primary care provider prescribed clindamycin 300 mg four times daily. The patient recalls some resolution of the erythema with this regimen; however, the eruption never fully cleared. Over the past two weeks, he notes the rash evolved from linear scratches to raised pustules, and ultimately to round, ulcerative lesions with "black spots." The patient reports "digging out" pustules using "needles" which elicited drainage of white and clear fluid. During this time the lesions have spread proximally from his ankles and lower legs to the level of his knees with few scattered papules on his arms, bilaterally. At its worst, he notes pain has been 10/10 in severity. In addition to pain, a review of symptoms is positive for itching, nausea, vomiting, sore throat, and wheezing. He denies any burning sensation, shortness of breath, joint pain, urinary symptoms, and fever. Past medical history is significant for asthma and substance use disorder. The patient also notes "bad teeth" for which he has undergone numerous dental procedures with the most recent being one month ago. He is unsure if his tetanus vaccination is up to date. Medications include Albuterol, Advair, and Suboxone sublingual tablets. He has no known drug or environmental allergies. Social history is positive for occasional alcohol consumption, a 30-year history of chewing tobacco, and 15 years of methamphetamine use. Family history is negative for autoimmune disease, cancer, or chronic conditions.

Physical exam reveals numerous circular, 2 mm -10 mm papules and few 5 mm - 40 mm ulcers with central necrosis scattered across the shins, calves, and ankles bilaterally (FIG. 1). Papules do not blanch upon pressure. Non-pitting edema can be seen on the lower legs in addition to some dry scale of the plantar feet. Further examination reveals approximately 10-20 red papules ranging from 2-6 mm in size on the bilateral wrists and forearms which are not necrotic. The patient's vital signs are within normal limits, including a temperature of 98.3 °F and oxygen saturation of 98% on room air. Examination of the head, neck, chest, and abdomen is unremarkable.

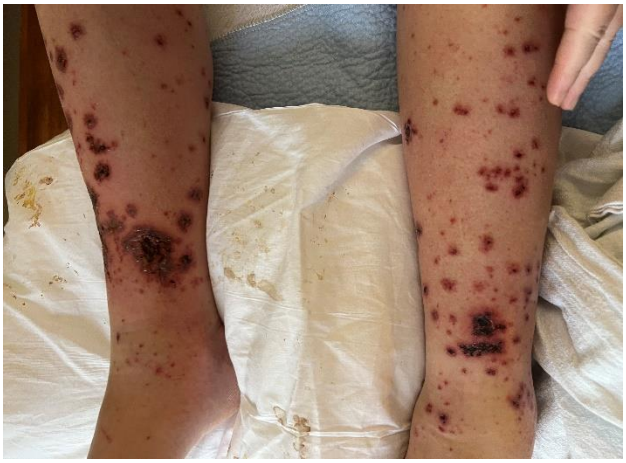

FIG. 1.

The patient is admitted to observation and an initial workup begins. Chest X-ray is negative for any obvious pulmonary causes of his reported wheezing. Lab draws are remarkable for eosinophilia (12.4×10^9/L, ref $<0.5 \times 10^9$/L) elevated ESR (27 mm/hr, ref 1-13 mm/hr) and elevated CRP (1.7 mg/dL, ref <1.0 mg/dL). Serial blood cultures are ordered to rule out bacteremia and endocarditis due to the patient's history of invasive dental procedures and illicit drug use. The patient is started on empiric antibiotic therapy with vancomycin and levofloxacin. Infectious disease is consulted.

2.2 Day 2: Infectious disease consultation

After a review of patient history and a thorough physical examination, the consulting physician suggests a differential diagnosis of DRESS syndrome (secondary to clindamycin) vs. vasculitis vs. *B. henselae* infection. Additionally, the physician orders an echocardiogram to rule out endocarditis while awaiting blood culture results. Two 4 mm punch biopsies are performed, sampling lesions from the patient's left lower leg. The patient's antibiotic regimen is switched to vancomycin, doxycycline, and cefepime for a broader spectrum of coverage. Lastly, a *Bartonella* assay is drawn.

2.3 Days 3-4: Continuation of care

Infectious disease and the hospitalist group continue to oversee the patient's care in collaboration. His echocardiogram reveals no abnormal findings. The patient is discontinued from vancomycin due to continued eosinophilia. Furthermore, three serial blood cultures all have negative findings, and infectious disease recommends the patient discontinue cefepime. Punch biopsy results are finalized revealing fibrinoid necrosis with a leukocytic and neutrophilic infiltrate. The pathologist reports a high suspicion for IgAV but recommends clinical correlation. Methylprednisolone is prescribed.

2.4 Day 5: Discharge

Over the next two days, the patient's eruption begins to resolve with significant decreases in pain, erythema, and swelling. His vital signs continue to remain within normal limits. After a four-day inpatient stay, the patient is discharged on a regimen of Doxycycline 100 mg twice daily and prednisone 10 mg daily. He is counseled on methamphetamine cessation. He leaves in stable condition and is instructed to follow-up with infectious disease and his primary care physician in 2 weeks. His *B. henselae* assay results are returned after discharge revealing negative serology for IgG and IgM, providing further evidence for the suspected diagnosis of IgAV.

3. Discussion

An annular rash can manifest secondary to a wide variety of both cutaneous and systemic diseases. These same pathologies are often defined by intrinsic variability in presentation and progression, further complicating the diagnostic process. The patient described in this case report possessed numerous risk factors for systemic disease including illicit drug use, invasive dental procedures, and exposure to unvaccinated animals, necessitating a broad scope of clinical suspicion. The patient's initial complaint of a rash secondary to cat scratches favored a diagnosis of *B. henselae* infection. Also known as cat scratch disease, this infection most commonly presents as a cutaneous eruption with regional lymphadenopathy but can include fever, visceral organ involvement, and neurologic manifestations [2]. An erythematous, vesicular lesion develops at the site of inoculation, often where a young cat or cat with fleas has scratched a patient. In this case, the patient's non-blanching lesions and exposure

to unvaccinated kittens favored this diagnosis [3]. However, the absence of lymphadenopathy and fever warranted further exploration.

DRESS syndrome was proposed as an alternative diagnosis by the infectious disease team. This drug-induced hypersensitivity reaction often initially involves a maculopapular rash that coalesces to form purpura and/or annular lesions. Cutaneous findings are often accompanied by eosinophilia and leukocytosis, as well as systemic symptoms, such as fever, lymphadenopathy, and signs of visceral organ involvement [4]. The patient's respiratory complaints, eosinophilia, and annular rash coincided with this description. Additionally, though DRESS syndrome is most often associated with antiepileptics, allopurinol, sulfonamides, and vancomycin, cases of clindamycin-induced DRESS have been reported [5,6]. Though the patient's recent medication use did coincide with the progression of this eruption, characteristics of DRESS still did not fully satisfy his clinical picture.

Throughout the patient's extensive workup, IgAV (formerly Henoch-Schönlein purpura) persisted as a potential diagnosis despite its non-classical presentation. Often diagnosed in children between four and six years of age, only approximately 10% of cases of IgAV occur in adults [7]. This self-limited systemic vasculitis is characterized by palpable purpura, arthralgias, abdominal pain, and kidney dysfunction and shows a preponderance for males (male-to-female ratio of 1.5:1) [8]. While the pathogenesis of IgAV is not fully understood, symptoms are presumed to be secondary to IgA immune-complex deposition within the skin and viscera [9,10]. Recent reports have also associated the onset of IgAV with COVID-19 and group A streptococcus infections [11,12]. Laboratory studies in IgAV patients may show mild leukocytosis, elevated inflammatory markers (ESR and CRP), occasional eosinophilia, and normal platelet levels; however, definitive diagnosis is obtained via skin biopsy. Biopsy will reveal leukocytoclastic vasculitis with deposition of IgA and fibrinoid necrosis, occurring most commonly in small vessels [13].

In this case, the patient's age, and lack of hallmark symptoms-renal, gastrointestinal, and joint manifestations-caused clinicians to question IgAV as a diagnosis of the observed annular eruption. However, rash morphology, respiratory symptoms (which may have been induced by COVID-19 due to endemic spread at the time of presentation), eosinophilia, and positive inflammatory markers suggested otherwise. It was not until punch biopsy results were received that IgAV was elevated to the primary differential. Considered the gold-standard of IgAV diagnosis, punch biopsy findings of "fibrinoid necrosis with a leukocytic and neutrophilic infiltrate" prompted the addition of steroids to the patient's treatment protocol, an intervention which was successful in reducing his symptomology. This case emphasizes the necessity of a comprehensive patient workup including extensive history, physical, and laboratory evaluation. Additionally, the patient's presentation, suggestive in-part of numerous pathologies, encourages clinicians to maintain a broad differential and exercise awareness of non-classical presentations. Such approaches can prevent the premature disregard of disease states for which the patient does not satisfy all traditional criteria and allow for a prompt improvement in patient health.

4. Conclusion

Proper diagnosis and treatment of annular rashes can prove challenging due to tremendous variety in pathologic associations. When evaluating these eruptions, it is essential to remain cognizant of atypical presentations of disease and to conduct a thorough history, physical, and laboratory workup to ensure a comprehensive clinical picture. Such approaches can aid in early intervention and quicker improvement in patient symptoms and well-being.

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