CLINICAL VIGNETTE

Not So Sweet: A Case of Acute Febrile Neutrophilic Dermatosis

Alexandra C. Milin, MD and Kelley Chuang, MD

Introduction

Neutrophilic dermatoses may have dramatic presentations that can mimic a variety of conditions. Early identification is key since the management greatly varies depending upon the underlying etiology.

Clinical Vignette

A 35-year-old previously healthy male with a history of keloids and cystic acne presented to an outside hospital with progressive skin lesions over his left scalp and neck. Three weeks prior he developed symptoms of an upper respiratory infection, and noted a "pimple" on his left occiput that he self-incised (Figure 1). A second lesion formed over the same area after several days. He went to a local urgent care center where he was given a course of oral doxycycline without improvement. He then presented to an outside hospital with a painful, purulent rash over his left occiput associated with fevers and leukocytosis with a white blood cell count of 27,000 (Figure 2). He developed signs of severe sepsis despite broad antibiotic coverage. The suspected diagnosis was necrotizing fasciitis, but a CT of the head and neck showed only diffuse soft tissue swelling of the neck, so surgical intervention was deferred. He was then transferred to our medical center for a higher level of care.

Upon arrival, he met severe sepsis criteria with a temperature of 40ºC, heart rate of 110 beats per minute, profound leukocytosis with a white blood cell count of 40,000, and had evidence of end organ damage with renal insufficiency and non-anion gap metabolic acidosis. His physical exam was notable for multiple large purulent tender plaques over his left parietal and occipital scalp with underlying skin necrosis and several associated unroofed bullae (Figure 3). There was a separate vesicular rash with superficial crusting on an erythematous base around his mouth, and two keloids over his chest with purulent drainage (Figures 4 and 5). Notably, two small blisters had also formed at the sites of suture insertion securing a central venous catheter that was placed at the previous hospital.

The patient was started on empiric antimicrobial coverage with daptomycin, meropenem, and acyclovir. A broad infectious work up revealed a herpes simplex virus type 2 (HSV-2) infection of his left scalp. Punch biopsy of his left posterior auricular scalp showed sheets of neutrophils. He was diagnosed with a bullous form of acute febrile neutrophilic dermatosis, also known as Sweet syndrome. Given its reported association with underlying malignancy and autoimmune disorders, the patient underwent an extensive evaluation for malignancy. He was treated with high dose intravenous corticosteroids that were later transitioned to rituximab. With these interventions, he had marked improvement in his skin lesions.

Discussion

This case highlights the difficulties frequently encountered in the diagnosis of Sweet syndrome. Patients are often febrile even prior to the onset of the rash and have usually seen several physicians, before the diagnosis is established. The classic rash consists of painful erythematous plaques or papules. Due to the presence of infectious signs and the concerning appearance of classic skin lesions, patients often receive empiric antibiotics. When antibiotics do not lead to clinical improvement, the diagnosis is further obscured since drug eruptions are often entertained. Other conditions to include on the differential diagnosis for this presentation are pustular psoriasis, pyoderma gangrenosum, and acute generalized exanthematous pustulosis. Acute pustular psoriasis often presents with signs of systemic inflammation and can be triggered by drugs, pregnancy, infection, or sudden withdrawal of corticosteroids.[1] Acute generalized exanthematous pustulosis is a systemic inflammatory drug reaction usually triggered by beta lactams, sulfa drugs, or diltiazem. Pyoderma gangrenosum can also present in a pustular form with skin pathergy as is seen with Sweet syndrome.[2] A high index of suspicion for non-infectious causes of pustular rash is warranted. Skin biopsy often establishes the diagnosis.

This young patient was diagnosed with neutrophilic dermatosis based on his symptoms and skin biopsy with the characteristic neutrophilic infiltration in the absence of vasculitis.[3] This poorly understood disease is thought to be a reactive process to an immunological trigger. One retrospective study of 77 patients found that 23% of patients had a preceding infection, 35% had an associated malignancy or myeloproliferative disorder, and 12% had a recent drug exposure that was thought to be the inciting event.[4] Akin to our patient, about 4% of patients in the study noted a flare of HSV several weeks prior to the diagnosis. In about half of the cases, a trigger was not identified. Multiple cytokines have been implicated in this condition, including G-CSF, interferon-gamma, and IL-1, 3, 6, and 8, which account for the SIRS response that is often misdiagnosed as sepsis.

The backbone of management for neutrophilic dermatosis is corticosteroids. Other treatment options include potassium iodide, colchicine, dapsone, cyclosporine, and newer biologic immune modulators. Any debridement or skin trauma will result in expansion and worsening of the skin rash. Our patient developed blisters around the suture insertion sites of his central venous catheter. Interestingly, even when left untreated, lesions often resolve spontaneously after several months but can leave scarring in areas of inflammation. Maintaining this condition on the differential diagnosis is critical to avoiding surgery and rendering the appropriate medical treatment.

Figures

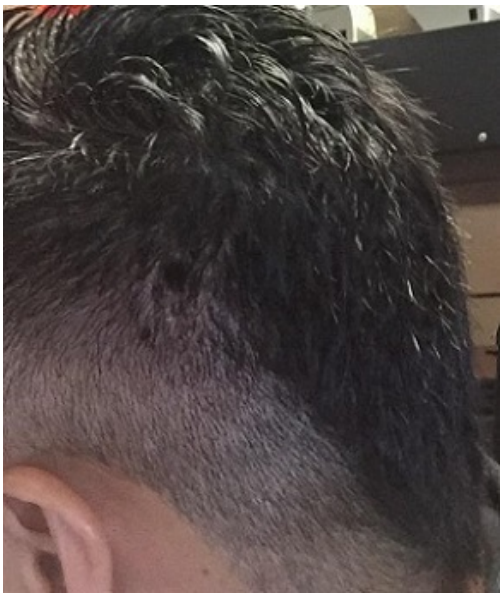

Figure 1

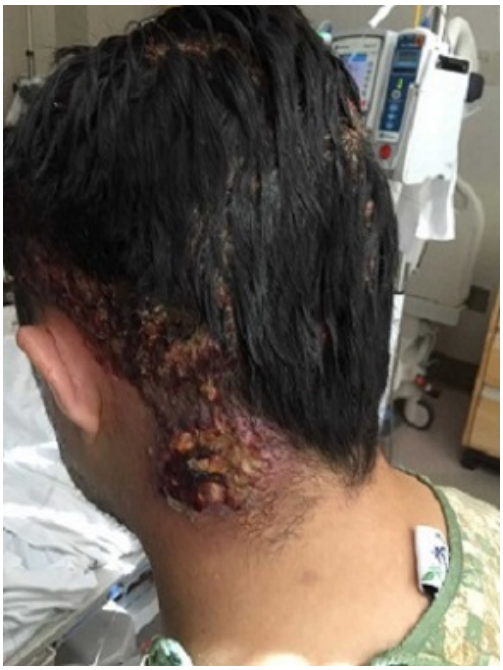

Figure 2

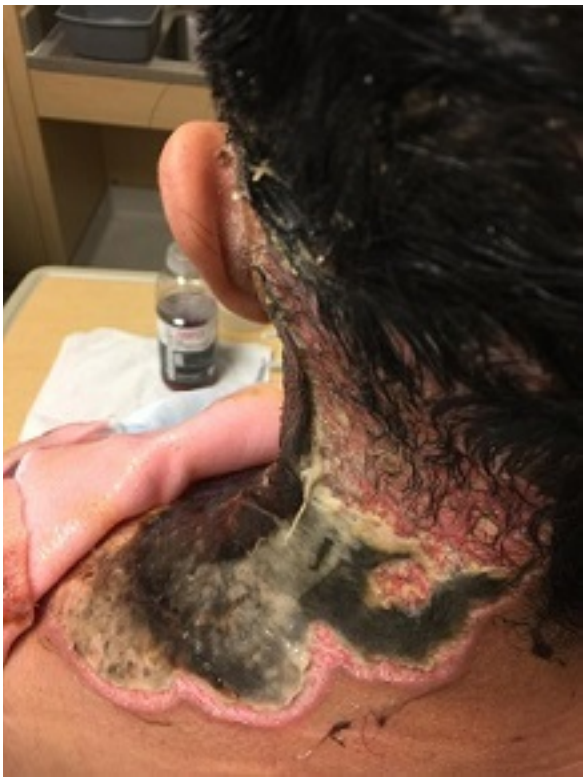

Figure 3

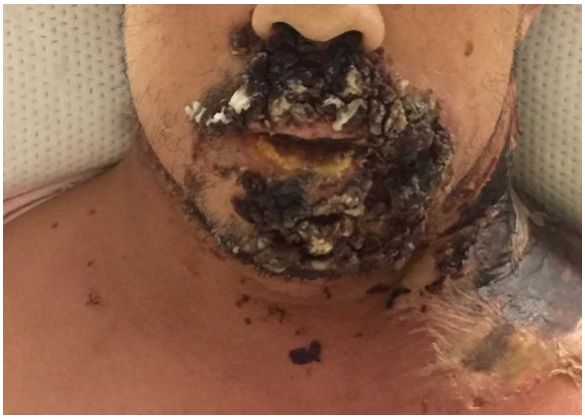

Figure 4

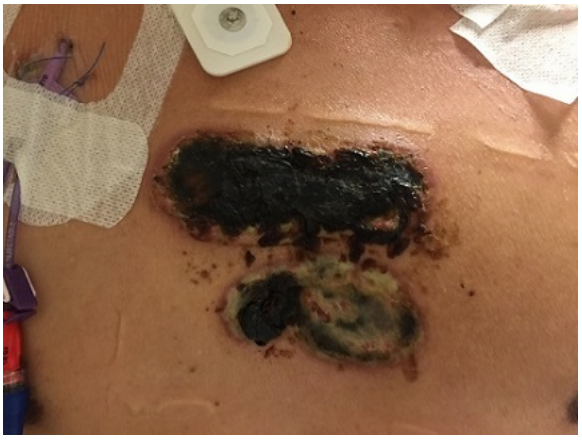

Figure 5

REFERENCES

1. **Benjegerdes KE, Hyde K, Kivelevitch D, Mansouri B**. Pustular psoriasis: pathophysiology and current treatment perspectives. *Psoriasis (Auckl)*. 2016 Sep 12;6:131-144. doi: 10.2147/PTT.S98954. eCollection 2016. Review. PubMed PMID: 29387600; PubMed Central PMCID: PMC5683122.
2. **Braswell SF, Kostopoulos TC, Ortega-Loayza AG**. Pathophysiology of pyoderma gangrenosum (PG): an updated review. *J Am Acad Dermatol*. 2015 Oct;73(4):691-8. doi: 10.1016/j.jaad.2015.06.021. Epub 2015 Aug 5. Review. PubMed PMID: 26253362.
3. **Cohen PR**. Sweet's syndrome--a comprehensive review of an acute febrile neutrophilic dermatosis. *Orphanet J Rare Dis*. 2007 Jul 26;2:34. Review. PubMed PMID: 17655751; PubMed Central PMCID: PMC1963326.
4. **Rochet NM, Chavan RN, Cappel MA, Wada DA, Gibson LE**. Sweet syndrome: clinical presentation, associations, and response to treatment in 77 patients. *J Am Acad Dermatol*. 2013 Oct;69(4):557-64. doi: 10.1016/j.jaad.2013.06.023. Epub 2013 Jul 23. PubMed PMID: 23891394.

Submitted October 23, 2108