Pyoderma Gangrenosum with Leukocyte Adhesion Deficiency Type 1

Tara Ghalambor, BS[1], Miranda Yousif, BS[1], Jordan Ward, MD[2], Lindsay Ackerman, MD[2]

[1]University of Arizona College of Medicine, Phoenix, Arizona, USA; [2]Banner University Medical Center, Phoenix, Arizona, USA

Background

Pyoderma gangrenosum (PG) is an inflammatory neutrophilic dermatosis characterized by progressive painful skin ulcerations with uniquely raised, undermined borders and violet-gray discoloration of the intact cutaneous margin.[1] In this case report, we present a case of recurrent, poorly healed PG lesions in a patient with Leukocyte Adhesion Deficiency type 1.

Case Presentation

A 41-year-old female with a history of developmental delay, ITGB2-associated Leukocyte Adhesion Deficiency type 1 (LAD), and recurrent skin infections since age 12 presented to the ED with extensive skin ulcerations and recurrent skin infections. Multiple lesions were noted including: one round ulceration with central eschar and a violaceous rolled border on the left distal thigh, several smaller violaceous edematous papules and plaques with overlying flaccid bullae on the right proximal thigh, one shallow ulceration with an erythematous border and fibrinous base on the gluteal cleft (figure 1), and extensive scarring from previous lesions proximal to the affected areas (figure 2). These skin findings, which had presented repeatedly for nearly 30 years, were consistent with the diagnosis of PG. Previous biopsy results showed chronic inflammation and scattered multinucleated giant cells without granuloma formation or malignancy.

The combination of the patient's developmental delay, severe pain and anxiety during dressing changes resulted in poor wound care, recurrent superimposed infections and sepsis requiring hospitalization. Once adequately treated for her infectious comorbidities with gentle debridement of necrotic tissue and IV antibiotics, the patient's clinical course related to PG was handled similarly to that of classic PG. She was treated effectively with IV steroids, infliximab. and diligent wound care using silver sulfadiazine primarily as a wound protectant.

Images

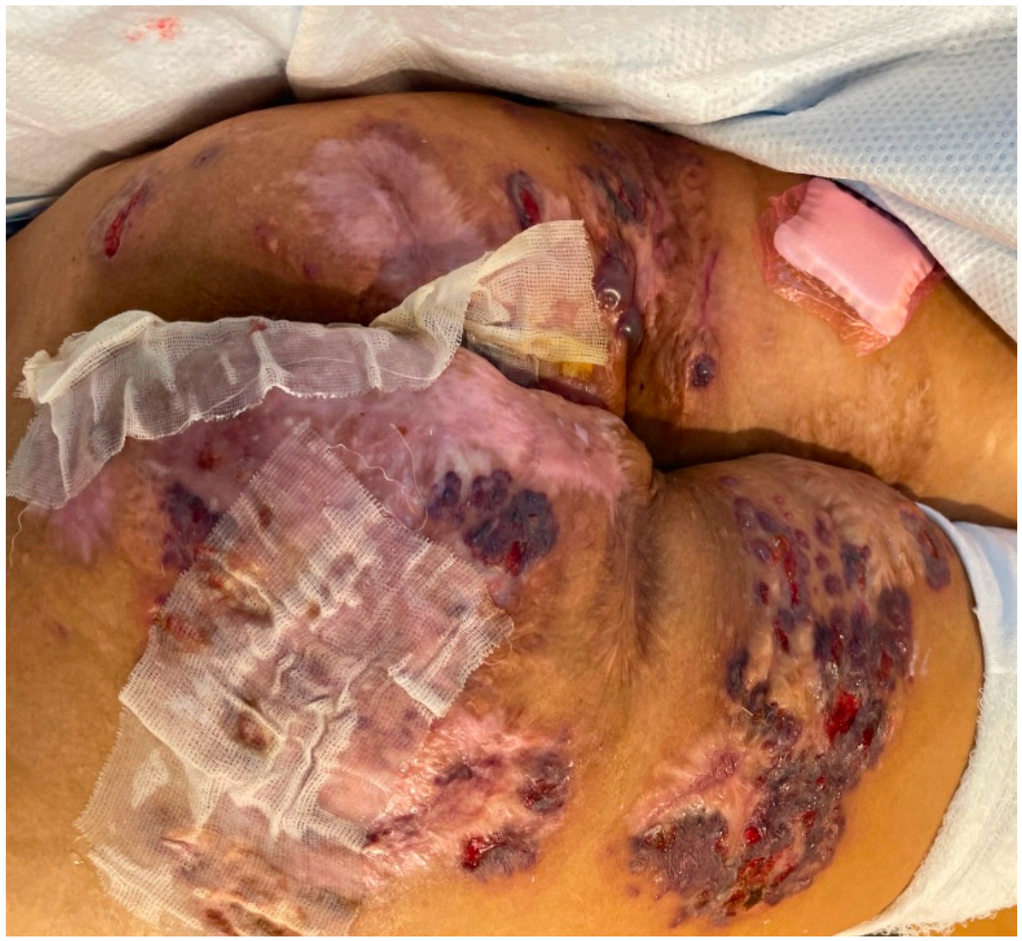

Figure 1: Gluteal cleft, proximal thigh, and previous scarring proximal to affected areas

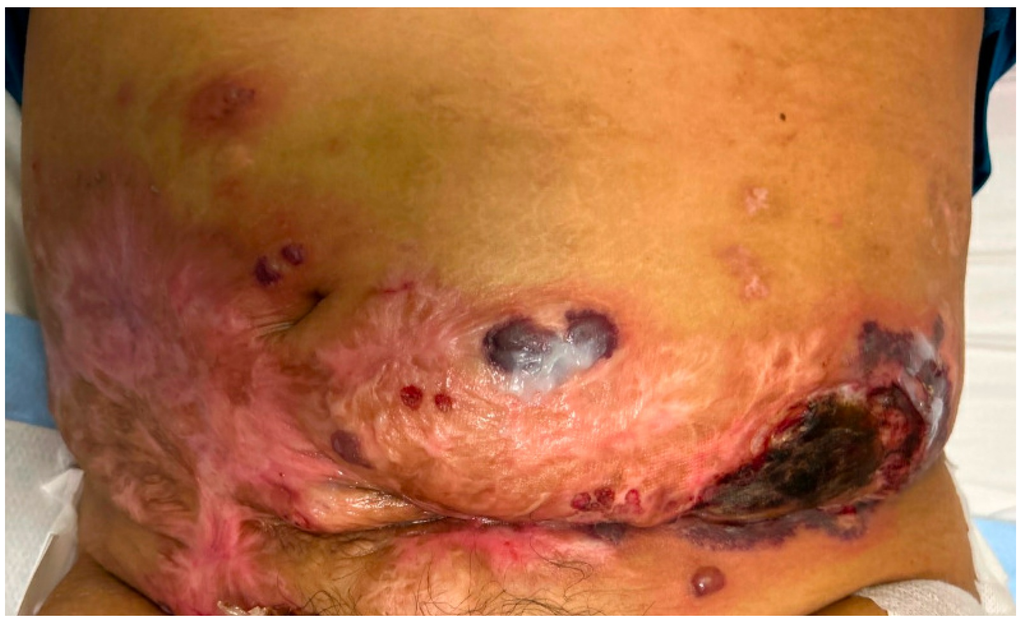

Figure 2: Extensive scarring from previous lesions in addition to an abdominal ulcer with central eschar

Conclusion

LAD-1 is a rare, inherited immunodeficiency that impairs organized neutrophil migration from the bloodstream to inflammatory sites due to mutated cell adhesion molecules. The ITGB2 gene codes for CD18, a molecule on the surface of leukocytes that facilitates their transmigration from the blood to the tissue.[2] Mutations of the ITGB2 gene results in failed tissue leukocyte recruitment resulting in recurrent skin and mucosal infections with characteristic poor wound healing, absent purulence, neutrophilia, and increased risk for septicemia. In the neonatal period, patients with LAD may present with omphalitis and delayed umbilical cord separation.[3] PG-like lesions in the setting of LAD-1 are rare, with only 14 reported cases with varying age of onset ranging from infancy to early 30s. Only 3 of the reported cases show sparse neutrophilic infiltrate on biopsy, which can be explained by the inability for chemotaxis into the ulcer.[4-5]

The idiosyncratic nature of this classic neutrophilic dermatosis arising in a patient with errant and impaired neutrophil migration capabilities is in and of itself an interesting physiologic finding. Our goal in publishing this case is to expand the available literature on this rare association of pyoderma gangrenosum arising in a patient with LAD-1, increasing awareness, and encouraging an effective multidisciplinary management team including dermatology, plastic surgery, infectious disease, and internal medicine.

References

1. Maronese CA, Pimentel MA, Li MM, Genovese G, Ortega-Loayza AG, Marzano AV. Pyoderma Gangrenosum: An Updated Literature Review on Established and Emerging Pharmacological Treatments. Am J Clin Dermatol. 2022 Sep;23(5):615-634. doi: 10.1007/s40257-022-00699-8. Epub 2022 May 24. PMID: 35606650; PMCID: PMC9464730.
2. Lekstrom-Himes JA, Gallin JI. Immunodeficiency diseases caused by defects in phagocytes. N Engl J Med. 2000 Dec 7;343(23):1703-14. doi: 10.1056/NEJM200012073432307. PMID: 11106721.
3. Justiz Vaillant AA, Ahmad F. Leukocyte Adhesion Deficiency. 2023 Jul 3. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 30969592.
4. Bondarenko AV, Boyarchuk OR, Sakovich IS, Polyakova EA, Migas AA, Kupchinskaya AN, Opalinska A, Reich A, Volianska L, Hilfanova AM, Lapiy FI, Chernyshova LI, Volokha AP, Zabara DV, Belevtsev MV, Shman TV, Kukharenko LV, Goltsev MV, Dubouskaya TG, Hancharou AY, Ji W, Lakhani S, Lucas CL, Aleinikova OV, Sharapova SO. Variable CD18 expression in a 22-year-old female with leukocyte adhesion deficiency I: Clinical case and literature review. Clin Case Rep. 2023 Aug 16;11(8):e7791. doi: 10.1002/ccr3.7791. PMID: 37601427; PMCID: PMC10432584.
5. Smith KN, Welborn M, Monir RL, Motaparthi K, Schoch JJ. Pediatric pyoderma gangrenosum associated with leukocyte adhesion deficiency type 1: A case report and review of the literature. Pediatr Dermatol. 2023 Mar 31. doi: 10.1111/pde.15292. Epub ahead of print. PMID: 37002583.