

Bullous Pemphigoid Masked as Severe Tinea Pedis Infection After Recent Covid Booster and Ankle Trauma



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 Level of Evidence: 4, Poster Category: Resident

Statement of Purpose

The purpose of this case study is to **1)** report an unusual presentation of bullous pemphigoid masked initially as erythematous tinea pedis with severe maceration and cellulitis **2)** to better understand the influence of recent vaccinations and trauma in the development of bullous pemphigoid. Additionally, we present this case **3)** to advocate for early lesion biopsy to prevent delay in treatment and **4)** to broaden our understanding of rare presentations of bullous pemphigoid to guide appropriate podiatric intervention.

Literature Review continued

Adverse reactions after COVID-19 vaccines are uncommon and have been previously reported as drug induced hypersensitivity, DRESS syndrome, and Stevens-Johnson syndrome^(1,2,5-9) However, there has been an increasing incidence of bullous pemphigoid after recent COVID-19 and RSV vaccines and boosters, especially in high-risk populations. These new findings warrant further investigation in-order to understand the risk as well as adequate timing in diagnosis of BP to prevent delay in treatment and wound progression.

Methods/Case Study

- A 75-year-old male presented to the emergency department for lower extremity cellulitis, maceration of interdigital spaces, right medial arch ulceration, and upper trunk erythematous rash. Labs revealed leukocytosis although patient was afebrile and hemodynamically stable.
- PMHx of idiopathic peripheral neuropathy, Hepatitis C, previous scabies, prior displaced fibular fracture (now healed), rheumatoid arthritis, recent COVID-19 booster (#2), RSV, and T-dap immunizations
- Patient was admitted for further rash work up and podiatry and dermatology services were consulted

Day X Since Admission	Physical Exam	Treatment/Plan
Day 1-2	Macerated interdigital ulcers with right plantar-medial bullae & ulcer	Betadine paint & DSD
Day 3	Maceration resolved, serous bulla remained at right plantar-medial arch and new hemorrhagic bulla left arch	Triamcinolone with miconazole powder, Lanced plantar medial bulla due to pain with WB, betadine, telfa, & DSD
Day 4	New serous bulla of hip, continued hemorrhagic bullae of plantar-medial arch b/l with worsening upper trunk rash	Dermatology consulted, upper trunk biopsy obtained

Results



Figure 1. Day 1 ER presentation with notable macerated interdigital and right plantar-medial arch ulcer with cellulitis (gentian violet from prior outpatient visit). **1B.** Day 3 of admission with improvement of interdigital maceration with new eruption of left hemorrhagic plantar bullae. **1C.** Day 4 of admission with continued hemorrhagic bullae. **1D.** 4-weeks post discharge with no interdigital maceration and resolving hemorrhagic bulla of the left foot, and near resolution of lesion to the right arch (s/p 4 weeks oral prednisone and topical triamcinolone).

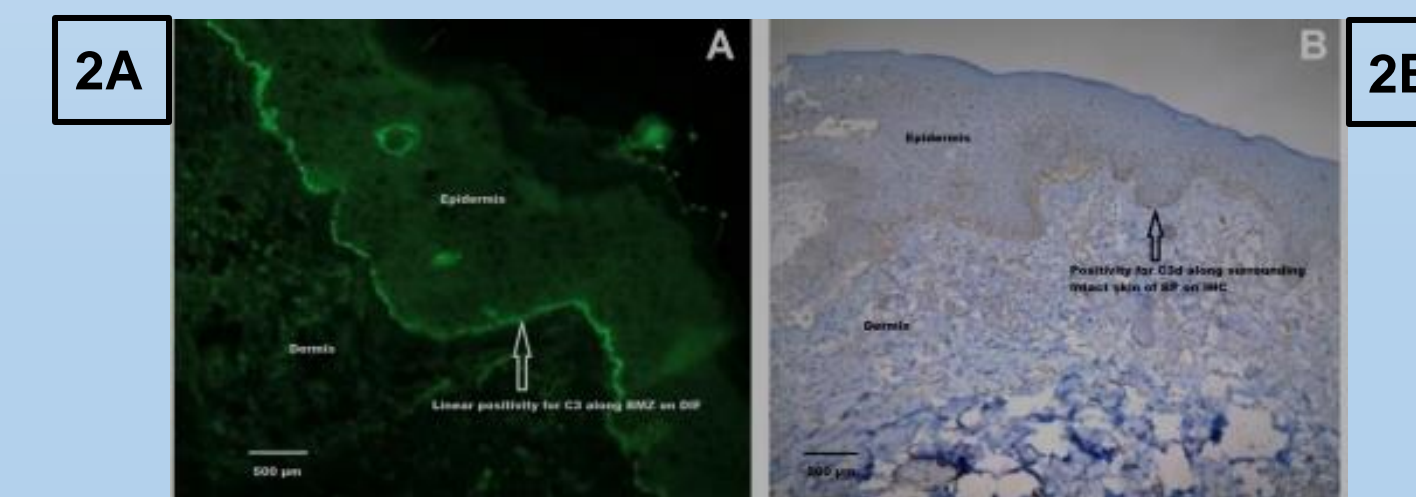


Figure 2 A. Direct immune-fluorescence of lesion biopsy with linear deposits of C3 at the basement membrane. **B.** C3d immunohistochemistry of lesion biopsy showing immunoreactivity at the basement membrane.⁽¹⁴⁾

- Histological analysis: positive for bullous pemphigoid
- Direct immunofluorescence analysis revealed +2 staining for C3 complement

Conclusion & Discussion

Recent literature reports increasing incidence of bullous pemphigoid after trauma and vaccinations in immunocompromised patients, usually but not limited to geriatric aged patients, likely due to an aging population^(10,11).

Current modalities of treatment for BP lesions include 60-80mg daily prednisone combined with topical corticosteroids for 4 weeks duration and can include dapson, azathioprine, mycophenolate mofetil, rituximab or IVIG infusions for refractory cases.⁽¹²⁾

As podiatric surgeons and clinicians, we understand the importance of protecting the integrity of the skin envelope in events of trauma and wound formation, especially in immunocompromised patients, to help provide an optimal healing environment and prevent infection.

With the increasing accessibility of COVID-19 and RSV boosters, and an aging population, it is important to have a higher index of suspicion for bullous pemphigoid which may warrant earlier viral and HLA screening and/or earlier prednisone treatment post-BP lesion development in trauma patients. Caution is needed with the use of prednisone in diabetics and warrants a multidisciplinary approach with medicine and dermatology colleagues^(3-8, 12).

The mechanism of bullous pemphigoid remains poorly described in the current literature. More research is warranted in-order to better understand the etiology and management course of this progressive disease process.

This case report draws awareness to the importance of considering bullous pemphigoid higher on the differential diagnosis in patients presenting with atypical tinea and bullous type lesions.

References

- Singh, D., & Swann, A. (2014). Bullous pemphigoid after bilateral forefoot surgery. *Foot & Ankle Specialist*, 8(1), 68-72. <https://doi.org/10.1177/1938640014546866>
- Verheyden DE, Adams A, Murray DF. A Systematic Review of Drug-Induced Pemphigoid. *Acta Derm Venereol*. 2020 Aug 17;100(15):adv00224. doi: 10.2340/00015555-3457. PMID: 32176310; PMCID: PMC3207627.
- Kim YB, Choi HS, Cho HK, Seo GW. Diagnosis and treatment of bullous pemphigoid that developed twice after total knee replacement arthroplasty: a case report. *BMC Musculoskeletal Disord*. 2021 Jan 28;22(1):118. doi: 10.1186/s12891-021-04000-6. PMID: 33599197; PMCID: PMC7842001
- Kidiri K, Ludwig RJ. The Growing Incidence of Bullous Pemphigoid: Overview and Potential Explanations. *Front Med (Lausanne)*. 2019 Aug 20;5:220. doi: 10.3389/fmed.2019.00220. PMID: 30177969; PMCID: PMC6109638.
- Biraharan M, Kaeber DC, Orme CM, Paravar T, Karis MY. Evaluating risk of bullous pemphigoid after mRNA COVID-19 vaccination. *Br J Dermatol*. 2022 Aug;187(2):271-273. doi: 10.1111/bjd.21240. Epub 2022 May 24. PMID: 35279833; PMCID: PMC9111666
- Tsujii Hirotsugu, Ichiki Naohisa, Niwa Hirofumi et al. (2023). Bullous pemphigoid following hand, foot, and mouth disease. *The Journal of Dermatology*; DOI: 10.1111/1346-8138.16979
- Aashish, Rai A, Khatri G, Priya, Hasan MM. Bullous pemphigoid following COVID-19 vaccine: An autoimmune disorder. *Ann Med Surg (Lond)*. 2022 Aug;80:104266. doi: 10.1016/j.amso.2022.104266. Epub 2022 Jul 31. PMID: 35936564; PMCID: PMC9339096
- Moffhous DE, Anerson E, Rosenbach M, Lipoff JB, Moustafa D, Tyagi A, Desai SR, French LE, Lim HW, Thiers BH, Hsuza GJ, Blumenthal KG, Fox LP, Freeman EE. Cutaneous reactions reported after Moderna and Pfizer COVID-19 vaccination: A registry-based study of 414 cases. *J Am Acad Dermatol*. 2021 Jul;85(1):46-55. doi: 10.1016/j.jaad.2021.03.092. Epub 2021 Apr 7. PMID: 33838206; PMCID: PMC8024548.
- Wan Y, Chen D, Shau CJ, Jung GW. Association between COVID-19 vaccination and bullous pemphigoid - a case series and literature review. *SAGE Open Med Case Rep*. 2022 Oct 17;10:2025313221151868. doi: 10.1177/2025313221151868. PMID: 35274658; PMCID: PMC9580382
- Alshammari, Fouad; Abuzaid, Yasoub; Korari, Abdulrahman; Alalain, Mohammed; Alzonia, Mohammed; Alsheef, Mohammed. Bullous pemphigoid after second dose of mRNA- (Pfizer-BioNTech) Covid-19 vaccine: A case report. *Annals of Medicine & Surgery* 75(1), March 2022. | DOI: 10.1016/j.amso.2022.103420
- E. Schmidt, D. Zillere, Pemphigoid diseases. *Lancet* 391 (2013) 320-332. [https://doi.org/10.1016/S0140-6736\(12\)61140-4](https://doi.org/10.1016/S0140-6736(12)61140-4).
- Langan SM, Smeeth L, Hubbard R, Fleming KM, Smith CJ, West J. Bullous pemphigoid and pemphigus vulgaris—incidence and mortality in the UK: population based cohort study. *BMJ*. 2008 Jul 9;337(7662):a180. doi: 10.1136/bmj.a180. PMID: 18614511; PMCID: PMC2483869.
- Bullous Pemphigoid: Causes, Symptoms, & Treatment (accessed 10/19/2024). <https://my.clevelandclinic.org/health/diseases/15855/bullous-pemphigoid>, 2021.
- Thakur, N., Chatterjee, D., Das, A., et al. Utility of C3d and C3d immunohistochemical staining in formalin-fixed skin or mucosal biopsy specimens in diagnosis of bullous pemphigoid and mucous membrane pemphigoid. *Sci Rep* 13, 11283 (2023). <https://doi.org/10.1038/s41598-023-38193-8>

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