

# A Case of Leukocytoclastic Vasculitis and Associated Conjunctivitis Following MMR Vaccine Administration

Hana Nazir<sup>1</sup>, Aubrey Hess<sup>1</sup>, Abha Soni<sup>2</sup>, and Kathryn Potter<sup>1</sup>

<sup>1</sup>Medical College of Georgia

<sup>2</sup>Contra Costa Pathology Associates

January 9, 2023

## Abstract

Leukocytoclastic vasculitis (LCV) is a small-vessel vasculitis characterized by immune complex deposition in the walls of dermal capillaries and venules. With the COVID-19 pandemic, more adults are receiving the MMR vaccine. We report a case of MMR vaccine-related LCV occurring only on the upper extremities with associated conjunctivitis.

## A Case of Leukocytoclastic Vasculitis and Associated Conjunctivitis Following MMR Vaccine Administration

Hana I. Nazir, BA<sup>1</sup>, Aubrey A. Hess, MD<sup>1</sup>, Abha Soni, DO, MPH<sup>2</sup>, Kathryn A. Potter, MD<sup>1</sup>

1. Medical College of Georgia, Augusta, GA, USA

2. Contra Costa Pathology Associates, Pleasant Hill, CA, USA

Word count: 610

Reference count: 10

Figure/table count: 3

Funding: none

The named authors have no conflict of interest, financial or otherwise.

Corresponding Author:

Hana Nazir

Medical College of Georgia at Augusta University

1004 Chafee Ave FH-100, Augusta, GA 30912

hnazir@augusta.edu

Tel: (706) 721-6231

## Key Clinical Message

As more adults are receiving MMR vaccines during the COVID-19 pandemic, it is important for clinicians to be aware of leukocytoclastic vasculitis as a potential adverse effect in order to treat their patients promptly and properly.

## Introduction

Leukocytoclastic vasculitis (LCV) is a small-vessel vasculitis characterized by immune complex deposition in the walls of dermal capillaries and venules. While the majority cases of LCV are idiopathic, the condition is often associated with infections and newly administered medications.<sup>1</sup> Here we report a case of LCV and associated conjunctivitis arising in a patient secondary to immunization with measles, mumps, and rubella (MMR) vaccine.

## Case Report

A 78-year-old man with a one-year-history of lenalidomide therapy for multiple myeloma presented to an outpatient dermatology clinic with a two-day history of a painful rash on hands, as well as red, painful eyes. He denied any recent upper respiratory infection or having started any new medications.

At the clinic visit, physical examination was notable for scattered pink dermal papules with a dusky red center bilateral dorsal and palmar hands, as well as bilateral conjunctival erythema. (Figure 1). Differential diagnosis included erythema multiforme, acute febrile neutrophilic dermatosis, erythema elevatum diutinum and multicentric reticulohistiocytosis. A punch biopsy was taken from the left index finger.

Histological examination revealed a dense perivascular and interstitial inflammatory infiltrate composed of lymphocytes, histiocytes, and numerous neutrophils with surrounding papillary dermal edema. High power views demonstrated scattered nuclear dust and fibrin within the walls of the small blood vessels with extravasation of red blood cells in the surrounding stroma (Figure 2). The patient's histopathological findings were most consistent with leukocytoclastic vasculitis (LCV). Upon discussion with the patient's oncologist, it became known that the patient had received an MMR vaccine two weeks prior to the rash. The patient followed up one week later with a more typical appearing rash for LCV (Figure 3). The rash resolved with use of topical clobetasol ointment and his eyes also cleared. The patient has continued to receive lenalidomide without any recurrence of the rash.

## Discussion

Leukocytoclastic vasculitis is a small-vessel vasculitis characterized by immune complex deposition in the walls of dermal capillaries and venules. LCV commonly presents as erythematous macules with palpable purpura bilaterally, often in the lower extremities. LCV has previously been associated with vaccines, including vaccinations to influenza and herpes zoster.<sup>2-4</sup>

MMR vaccine-induced LCV in adults, accompanied with conjunctival injection has rarely been described. Typically, the MMR vaccine is indicated for children and adults born before 1957.<sup>5</sup> With the recent COVID-19 pandemic, more adults are receiving the MMR vaccine as it may induce innate immune responses that provide protection against COVID-19 infection via decreased production of pro-inflammatory cytokines.<sup>6</sup>

While the MMR vaccine rarely results in serious adverse effects, it has been associated with fever, transient rashes, transient lymphadenopathy, and parotitis in certain cases.<sup>5</sup> Additionally, subtypes of leukocytoclastic vasculitis in children, such as Henoch-Schonlein purpura and acute hemorrhagic edema of infancy have been reported following MMR vaccine.<sup>7,8</sup> There is one case report of a patient who developed LCV on her upper extremities and uveitis associated with MMR vaccination.<sup>9</sup>

Given that lenalidomide can also cause LCV, the history of recent vaccination was important for this patient to be treated appropriately.<sup>10</sup> Had his oncologist not known about the recent MMR vaccination, it is likely that the treatment of his multiple myeloma would have been postponed or altered. In this case, it is unlikely that lenalidomide triggered the patient's vasculitis given that the patient has continued to receive lenalidomide without recurrence of the rash. Moreover, the patient had a longstanding prior history of lenalidomide therapy without any occurrence of LCV.

This is an interesting presentation of LCV occurring only on the upper extremities with associated conjunctivitis. As more adults are receiving the vaccine during the COVID-19 pandemic, it is important for clinicians to be aware of potential side effects to treat them promptly and properly.

## Author Contributions:

Author 1: Hana I. Nazir, BA, drafting of manuscript

Author 2: Aubrey A. Hess, MD, critical revision of manuscript

Author 3: Abha Soni, DO, MPH, histological description, critical revision of manuscript

Author 4: Kathryn A. Potter, MD, critical revision of manuscript

## References

1. Baigrie D, Bansal P, Goyal A, et al. Leukocytoclastic Vasculitis. [Updated 2020 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): *StatPearls Publishing*; 2020.
2. Cao S, Sun D. Leucocytoclastic vasculitis following influenza vaccination. *BMJ case reports*. 2017:bcr2016217755.
3. Monjazebe S, Philips RC, Wilkerson M. (2016A case of leukocytoclastic vasculitis following influenza vaccination. *JAAD case reports*. 2016;2(4):340–342.
4. Puram V, Lyon D, Skeik N. A Unique Case Report on Hypersensitivity Vasculitis as an Allergic Reaction to the Herpes Zoster Vaccine. *Vasc Endovascular Surg*. 2019;53(1):75-78.
5. McLean H, Fiebelkorn A, Temte J, Wallace, G. Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013 Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2013;62:1-34.
6. Anbarasu A, Ramaiah S, Livingstone P. Vaccine repurposing approach for preventing COVID 19: can MMR vaccines reduce morbidity and mortality? *Human Vaccines & Immunotherapeutics*. 2020;16(9):2217-2218.
7. Da Dalt L, Zerbinati C, Strafella, MS, Renna S, Riceputi L, Di Pietro P, Barabino P, Scanferla S, Raucci U, Mores N, Compagnone A, Da Cas R, Menniti-Ippolito F. Henoch-Schönlein purpura and drug and vaccine use in childhood: a case-control study. *Italian journal of pediatrics*. 2016;42(1):60.
8. Binamer Y. Acute hemorrhagic edema of infancy after MMR vaccine. *Ann Saudi Med*. 2015;35(3):254-256.
9. Sedaghat M, Zarei-Ghanavati S, Shokoochi S, Ghasemi A. Panuveitis and dermal vasculitis following MMR vaccination. *East Mediterr Health J*. 2007;13(2):470-4.
10. Loree, Jonathan M., et al. "Leukocytoclastic vasculitis following lenalidomide during the treatment of follicular lymphoma." *Leukemia & Lymphoma* 58.3 (2017): 711-714.

## Figure Legend

**Figure 1.** Patient presentation at rash onset.

**Figure 2.** Histology on low (Hematoxylin-eosin stain; original magnifications: Ax 20) and high (Hematoxylin-eosin stain; original magnifications: Bx 200) power show a moderately dense perivascular and interstitial inflammatory infiltrate composed of lymphocytes, histiocytes, and numerous neutrophils with surrounding papillary dermal edema. C./D. High power views demonstrate scattered nuclear dust (karyorrhexis) and fibrin within the walls of the small blood vessels with extravasation of red blood cells in the surrounding stroma (Hematoxylin-eosin stain; original magnifications: Cx 400; Dx 400).

**Figure 3.** Rash at 1 week follow up.

**Consent statement :** Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.



