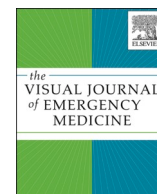




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## Visual case discussion

## Moderna COVID-19 vaccine induced skin rash

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## Visual case discussion

A 62-year-old male patient was admitted with the chief complaint of a blistering rash on his anterior chest and upper torso for the past month. Patient past medical history is significant for seasonal allergies, hypercholesterolemia, and mental retardation with guardian appointed personnel. The patient was found to have an allergy to peaches, of which the reaction is unknown. Patient reported no new initiations of any medications nor changes in current medications which included risperidone 1 mg PO q12h, atorvastatin 10 mg PO qHS, and loratadine 10 mg PO q12h. As per the patient's guardian, the patient received the Moderna COVID-19 vaccine within the month prior to hospital admission. He adamantly denied usage of new soaps or detergent. The patient reported that he developed a mild rash 2 weeks after the first dose that resolved without intervention. Following the second dose of Moderna vaccine, he started developing worsening of the blisters and redness to the anterior chest, genitalia, bilateral hands, and bilateral lower feet with larger blisters involving the sole aspect of his feet. The patient denied any oral or facial mucosal involvement. There were no infectious symptoms preceding this event and no associated fevers, chills, chest pain, shortness of breath, abdominal pain, nausea, vomiting, urinary or stool changes.

The patient was admitted to the burns ICU and a skin biopsy of the left shoulder revealed findings consistent with erythema multiforme, bullous pemphigoid and Stevens-Johnson Syndrome. Given no mucosal involvement, Stevens-Johnson Syndrome was less likely. Toxic epidermal necrolysis could be another differential; however, no necrosis of epidermis was observed in the biopsy. Biopsy also showed a presence of a significant number of eosinophils that could be suggestive of drug-induced erythema multiforme. Periodic acid-Schiff (PAS) and Grocott

methenamine silver (GMS) stains were negative for fungal organisms.

## Questions and answers with a brief rationale true &amp; false and / or multiple-choice questions

- Given the patient's presentation, what is the most likely diagnosis?
  - SJS
  - TEN
  - Bullous Pemphigoid

Correct Answer = C

-The lack of mucosal involvement, no skin detachment observed makes SJS less likely to be the diagnosis.

-The biopsy showed no necrosis of epidermis and also there was no mucosal involvement.

-Given the patient presentation and multiple fluid-filled blisters, bullous pemphigoid would be a likely diagnosis

- Could this rash be drug or vaccine induced?
  - Drug-induced
  - Vaccine-induced
  - both A And B
  - none of the above.

Correct Answers = C

There is a possibility this rash is drug induced by the patient's home medication of risperidone; however, the patient has been stable on risperidone for several years and less likely to be the cause of a drug-induced erythema multiforme.

Risperidone-induced erythema multiforme have been reported in

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Fig. 1.

literature search, however it presents as a mild, self-limiting reaction needing only supportive treatment such as use of topical steroids, fluid and electrolyte replacement, and pain/analgesia management.

The patient denied the addition of any new medications including soaps or detergents.

There is a high probability that the rash is Moderna COVID-19 vaccine induced, given the temporal relationship between vaccination administration and rash development. Within 10 days from the first dose, the patient developed a self-resolving mild rash that subsequently expanded into bullous lesions following four days after second vaccination completed.

This is an FDA reportable adverse reaction through MedWatch, given COVID-19 vaccine is a new entity developed during the pandemic to be administered under Emergency Use Authorization (EUA).

- 1 Once a diagnosis is given, how could the patient's condition be medically optimized?
  - a) Topical corticosteroid
  - b) Systemic corticosteroid
  - c) Steroid-sparing immunosuppressant
  - d) Immunomodulator
  - e) All of the above

Correct Answer = E

Once diagnosis is established based on skin biopsy, patient therapy is codependent on the severity of the rash and extent of skin involvement. Once the source control is achieved, patient may be prescribed the following agents in sequential or combinational based on severity:

- Mild/moderate: Topical corticosteroids, such as triamcinolone cream
- Mild/moderate/severe: Add systemic corticosteroids, such as methylprednisolone IV or prednisolone PO if patient is able to tolerate oral route
  - o Weight-based corticosteroid dosing 0.5–1 mg/kg/day in divided or daily dosing
- Moderate/severe: Steroid-sparing immunosuppressant such as mycophenolate mofetil, methotrexate, and azathioprine
- Severe/refractory: Immunomodulator agents for example, rituximab, IV immunoglobulin (IVIG)

#### Author declaration Template

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant



Fig. 2.



Fig. 3.

financial support for this work that could have influenced its outcome.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no





Fig. 4.



Fig. 5.

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We further confirm that any aspect of the work covered in this manuscript that has involved either experimental animals or human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript. Figs. 1–5

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