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Case Report

Varicella Zoster Reactivation Post COVID-19 Vaccination: Two Case Reports

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Abstract

Background: After initiation of COVID-19 vaccination, many side effects were described (Itching, swelling, pain, redness, induration, coughing, fatigue, fever, diarrhea, nausea, headache, vomiting, pruritus, myalgias, arthralgias, anorexia, malaise). Whether traditional, vector-based, or mRNA-based, all COVID-19 vaccines have had many mild and severe adverse events. In this article, we describe two cases of Varicella-Zoster Virus (VZV) reactivation one day after receiving Pfizer's mRNA-based vaccine first dose, and another one month after the second dose. Both patients were not immunodeficient and not on immunomodulator therapy. To our knowledge, few similar cases have been described in the literature before, and thus it would be an important addition to guide future expectations and management in morbid patients receiving the mRNA vaccine for COVID-19.

Case presentation: Case one is a 74-year-old male who presented with zoster reactivation one day after receiving the first mRNA COVID-19 vaccine. He was treated successfully with valacyclovir. The second case is an 83-year-old lady who presented with facial zoster reactivation one month post the second dose of the mentioned vaccine and was also treated with oral valacyclovir.

Conclusion: The patients were not immunodeficient and not on immunomodulatory therapy, which is a major difference from the other reported cases, which are already few in the literature. To our knowledge, very few similar cases have been described in the literature before. Reporting more of such rare side effects would be of utmost importance to establish a full side effect profile of mRNA vaccines and to better understand such clinical finding. It is worth noting, however, that despite the risks that accompany these vaccines, the benefits far outweigh them.

Keywords: Case Report, Zoster, COVID-19, Pandemic, Vaccine, mRNA

Introduction

The exponential increase in COVID-19 vaccination rate as the pandemic spread has led to a lot of concern regarding its side effect profile, fueling major resistance moves against the vaccine [1]. Among the annoying side effects are the skin manifestations post-vaccination. Many adverse reactions were noted post-COVID-19 vaccination (Itching, swelling, pain, redness, induration, coughing, fatigue, fever, diarrhea, nausea, headache, vomiting, pruritus, myalgias, arthralgias, anorexia, malaise) [2]. Whether traditional, vector-based, or mRNA-based, all COVID-19 vaccines have had many mild and severe adverse events [2]. Nevertheless, zoster reactivation remains an important, yet rare entity to be described after mRNA-based vaccines. In this article, we describe two cases of Varicella-Zoster Virus (VZV) reactivation one day after receiving Pfizer's mRNA-based vaccine first dose and another one month from the second dose. Both patients were not immunodeficient and not on immunomodulator therapy. To the best of our knowledge, few similar cases have been described in the literature before, and thus it would be an significant report to guide future expectations and management in morbid patients receiving the mRNA vaccine. It would also provide more insight into such a scarce yet very aversive finding in the general population. Indeed, with the ever-increasing numbers of people getting vaccinated worldwide, mentioning the lesser-seen adverse effects would always be of additional benefit.

Case Presentation 1

This is a 74-year-old gentleman who presented with vesicular lesions that developed on the left side of the abdomen. These lesions extend from the back midline along the T9-T10 dermatome, spreading to the umbilicus. The lesions were very painful and red. One day before, the patient family reported him receiving the first dose of the Pfizer-BioNTech vaccine. There has been no reported fever, chills, diarrhea, vomiting, nausea, or abdominal pain. No lesions were described elsewhere on the patient's body.

The patient's past medical history was obtained from his wife because of a history of a Cerebro-Vascular Accident (CVA) on May 30th, 2017, with right-sided paralysis and expressive aphasia as sequelae. His medical history also includes congestive heart failure (CHF, status post open bovine Mitral Valve Replacement (MVR) seven years ago), history of Crohn's disease (CD, diagnosed 25 years ago, was well-controlled on Mesalazine (Asacol), that was stopped by the patient around ten years ago without new flareups), atrial fibrillation, dyslipidemia (DL), and benign prostate hyperplasia (BPH). He has a history of childhood chickenpox infection. Past surgical history includes a laminectomy performed twelve years ago, as well as the described MVR. He is of Mediterranean descent. He did not have a significant family history apart from diabetes mellitus type 2. The patient was a very heavy smoker, with over 120 pack-year smoking history. He stopped smoking after his CVA four years ago. He was an occasional alcohol consumer with no known history of food or drug allergies. He was on Esomeprazole, Bisoprolol, Levetiracetam, Venlafaxine, Dutasteride, N-Acetylcysteine, Amiodarone, Atorvastatin, Silodosine, Rivaroxaban, and Quetiapine.
Upon physical examination, the patient was found to be afebrile and with normal vitals. His neurological status was at his baseline with no signs of deterioration. Chest auscultation was normal and cardiac examination revealed an irregularly irregular rhythm with a mild mitral regurgitation murmur. Skin examination revealed the presence of a maculo-vesicular rash that was painful and itchy, spreading along the left T9-T10 dermatomal area from the back midline to the umbilicus and limited to the left side (Figure 1).

Lab evaluation revealed a white count of 6,310/mm3, and a platelet count of 138,000/mm3. Hemoglobin was 15.2 g/dl. Sodium level 132mmol/l, Potassium 4.14 mmol/l, Chloride 101mmol/l, Serum Glutamic Pyruvic Transaminase (SGPT) 77IU/L, International Normalized Ratio (INR) 1.65, and Partial Thromboplastin Time

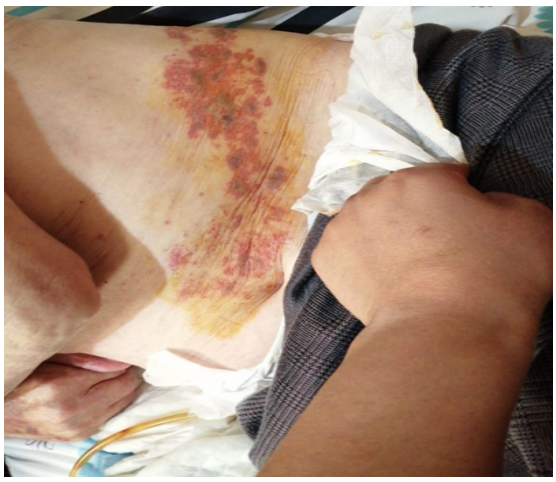

Figure 1: Picture showing the maculo-vesicular rash spreading along the left T9-T10 dermatomal area.

(PTT) 43.6 sec. C-Reactive Protein (CRP) was 24 mg/l. IgE level: 80.88UI/ml.
The patient was diagnosed with zoster reactivation. He had regular wound antiseptic dressings and was given Valtrex (Valacyclovir) 500mg two tablets every 8 hours for ten days. The patient did well, and the shingles became less painful over the course of 48 hours, regressing and responding to the antiviral medication. No further investigations were performed, and the patient proceeded to take the second dose of the vaccine with no complications. The first two images show the lesions seen on this patient (Figure 1,2).

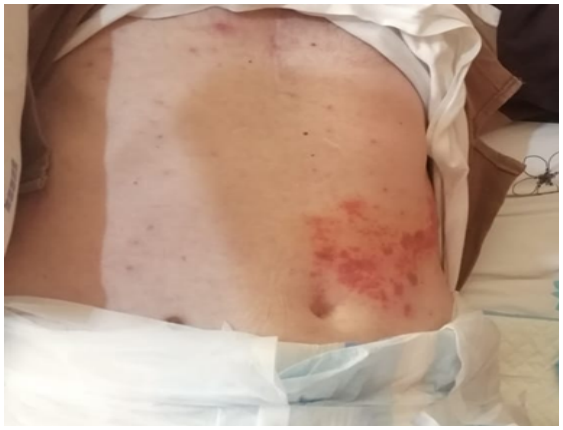

Figure 2: Picture showing the maculo-vesicular rash spreading along the left umbilical region.

Case Presentation 2

This is a case of an 83-year-old lady who presented with vesicular lesions on the left side of the face. They started on the upper lip and then spread to the left periorbital and nose area over the course of a few days. The lesions were very painful with a burning sensation. The patient's symptoms started on 18/04/2021. A day later, she applied an unknown steroid ointment which she does not recall, and the lesions became more aggressive. The patient reported having received the COVID-19 Pfizer-BioNTech vaccine second dose on 19/03/2021. Her past medical history includes tachycardia and congestive heart failure. She has a history of childhood chickenpox infection. She does not have a surgical history. She is a never smoker and a non-alcoholic with no history of surgeries except for bilateral cataracts. The patient is allergic to Aspirin.
She is of Mediterranean descent and has a family history significant for congestive heart failure. Patient medications included Atenolol, Aspirin, and Furosemide. Physical examination reveals no fever and normal vital signs. Chest and cardiac exams were non-revealing except for an old systolic ejection murmur. Skin examination revealed the presence of a maculo-vesicular rash that was painful and itchy, spreading along the left side of the face involving the eye and nose, limited to the midline (Figure 3).

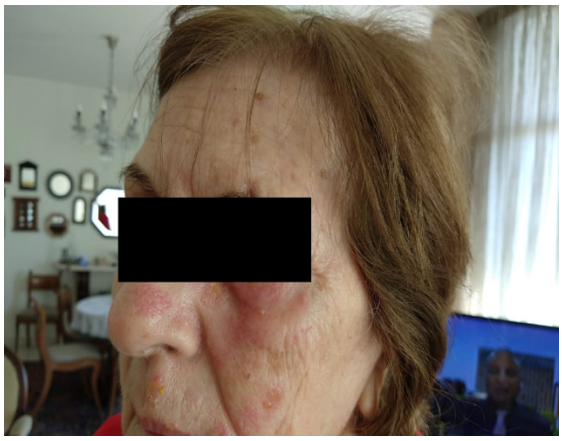

Figure 3: Picture showing the maculo-vesicular rash spreading along the left side of the face with eye and nose involvement.

A lab workout was not performed. The patient was diagnosed with varicella-zoster reactivation clinically and started on Valacyclovir 500mg 2 tablets every 8 hours for ten days. The patient recovered fully and

proceeded to take the second and third doses with no complications. The third image shows the lesions seen on this patient.

Discussion

This report presents a new case of zoster reactivation after exposure to Pfizer-BioNTech's COVID-19 mRNA vaccine. The first patient had a history of Crohn's disease that is well-controlled off treatment with mesalazine for ten years. The other case was relatively previously healthy with no evidence of any chronic inflammatory conditions or autoimmune process.

Varicella-Zoster Virus (VZV) presents as a primary infection of chickenpox that usually recovers, but the virus stays dormant in the cranial and dorsal root ganglia and never leaves the body [3,4]. Zoster would be caused by the reactivation of this virus that can come spontaneously but is more often linked to stress, trauma, or any state of immunosuppression [4]. It usually presents as unilateral vesicular painful lesions spreading along the course of 1 dermatome [5].

The literature describes a few cases of reactivation of VZV after COVID-19 infection [6]. However, the reports of its reactivation following vaccination remain few [4]. The vaccine would possibly induce a form of immune modification that would trigger the VZV reactivation [5]. There has been some literature describing VZV reactivation after receiving other vaccines than COVID-19 vaccines, such as yellow fever or hepatitis A [7]. Interestingly, the cases of zoster reactivation associated with COVID-19 vaccination seem to be mild [8]. Even though reactivation of herpes zoster was not described in the initial trials of COVID-19 vaccines, several cases reporting that aspect were described [9]. It has been hypothesized that the shift of CD8+ T cells that keep zoster under control cannot keep up with the suppression after the big shift of naïve CD8+ to target SARS-COV2. [9]. Many of the cases reported though are associated with immunosuppressive medication use, whether steroids, Rituximab, or others [10]. There is little known about the risk of viral activation in patients with autoimmune conditions after the SARS-CoV-2 mRNA vaccine. A case series was reported in the Palestinian territories published on April 15, 2021, where six patients, all with autoimmune comorbid conditions like rheumatoid arthritis or antiphospholipid syndrome, experienced VZV reactivation a few days after the COVID-19 mRNA vaccination [2]. To note, all those patients were on immunomodulation agents or steroids while receiving the vaccine, whether tocilizumab, tofacitinib, baricitinib, padacitinib, mycophenolate mofetil, or prednisone [2]. In a study in Switzerland published on April 9th, 2021, cases of VZV activation were reported up to 55 days after the Pfizer or Moderna Vaccine [7]. Another case was described five days after receiving the inactivated COVID-19 vaccine on February 27th, 2021 [11].

Despite the possible various risks that might be associated with COVID-19 vaccination, the benefits of vaccines, especially in areas where the incidence and prevalence of infection remain high, far outweigh their risks [12]. Van Dam et al. describe the risk of zoster reactivation that seems to be associated with both vaccination and infection with COVID-19 [13]. The rate of activation associated with the actual infection seems to be higher, possibly due to a greater presence of lymphopenia [13]. A systemic review of 54 patients could not find a solid link between the described vaccines and zoster [14]. Vaccination against COVID-19 remains strongly recommended as a result [15].

Conclusion

What is different in our cases is that our first patient was on no immunomodulatory agents and that the VZV activation occurred within as little as 24h after the injection. The second case presents a reactivation after the second mRNA vaccine dose in a patient with

no history of autoimmune disorders or inflammatory disease.

Even though reactivation of VZV is reported with various vaccines and following COVID-19 infection, few are the cases that report such a reactivation after vaccination against COVID-19 specifically [4,5]. Therefore, reporting new cases remain crucial as they can provide a hint of what to expect in patients with or without autoimmune conditions after receiving the mRNA COVID-19 vaccine, as well as more insight about such a condition.

With enough evidence and cases, such findings might be clustered in the future to highlight a possible association with the vaccine, or to possibly define an actual risk of reactivation of VZV associated with it. With more new cases emerging, such a finding might be found not to be that rare after all. However, despite the reported complications, the benefits of vaccination against SARS-COV2 far exceed the risks and are therefore still recommended.

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