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Case Report **Pathology**

Leucocytoclastic Vasculitis Following Coronavirus Vaccine: A Case Report

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Abstract

Background: The coronavirus disease 2019 pandemic is an unprecedented situation. Mass vaccination is a considered a promising solution to combat this global health crisis. Different vaccine have used to control transmission of the disease. Some complications of this vaccine were reported including rare cases of vasculitis. We report a case of leucocytoclastic vasculitis following BNT162b2 corona virus vaccine. ***Case Presentation****:* A 42 year old man with no medical history or drug intake presented 3 days after the third dose of BNT162b2 vaccine an infiltrated purpura at the lower extremities, fever, asthenia and myalgia. At physical examination, multiple palpable indurated purpuric papules were present only on the lower extremities. Laboratory tests were normal. The skin biopsy revealed leucocytoclastic vasculitis. The direct immunofluorescence staining detected only fibrinogen deposition. ***Conclusion:*** Leucocytoclastic vasculitis is an exceptional vaccine side effect. The resemblance of the vaccine-induced spike proteins with human components is highly likely to produce pathological autoantibodies and vaccine-induced autoimmunity through molecular mimicry.

Keywords: Coronavirus vaccine, vaccination, COVID-19, leucocytoclastic vasculitis.

INTRODUCTION

In 2019, Humanity faced with an unprecedented situation caused by the coronavirus disease [1]. Efforts were mobolized worldwide to control coronavirus transmission and infection [1]. Mass vaccination is a promising solution to combat this global health crisis [1]. Different vaccines have been developed within a year to induce immunity [2]. One of the earliest approved vaccine was the mRNA-based vaccine BNT162b2 [3]. The most common side effects following COVID- 19 vaccination are typical vaccine related symptoms, such as pain at injection side, chills, fever, arthralgia, myalgia and headache [4]. Vasculitis cases following vaccination against COVID-19 are exceptional [1]. We report the case of a patient who developed a leucocytoclastic vasculitis three days after vaccination with BNT162b2

CASE REPORT

A 42 year old man with no medical history or drug intake presented 3 days after the third dose of BNT162b2 vaccine and 6 months after the two doses of ChAdOx1 nCoV-19 an infiltrated purpura at the lower extremities, fever, asthenia and myalgia without respiratory gastrointestinal or urinary symptoms. At physical examination, multiple palpable indurated purpuric papules were present only on the lower extremities. Initial laboratory tests including erythrocyte sedimentation rate and c-reactive protein were normal. Antistreptolysin-o, antineutrophil cytoplasmic antibodies (ANCA) and cryoglobulin were negatives. Skin biopsy revealed infiltration of vessel walls with neutrophils that also extend into the perivascular zone and beyond. These neutrophils undergo degeneration. The vessel walls are thickened by the exudate of inflammatory cells and edema fluid. There is also exudation of fibrin. Endothelial cells are usually swollen and some are degenerate. The dermis shows minime edema and extravasation of red blood

cells. The direct immunofluorescence staining detected only fibrinogen deposition.

Figure 1: Palpable purpuric papules at the lower extremities

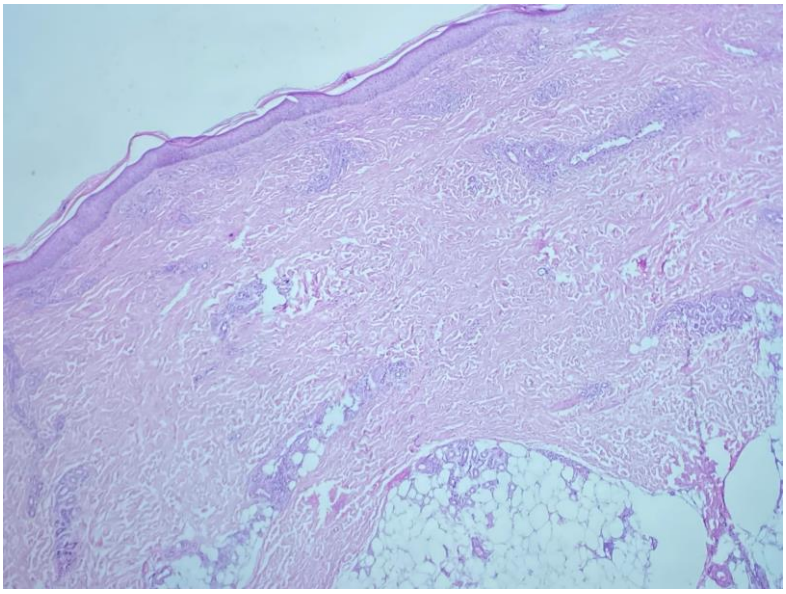
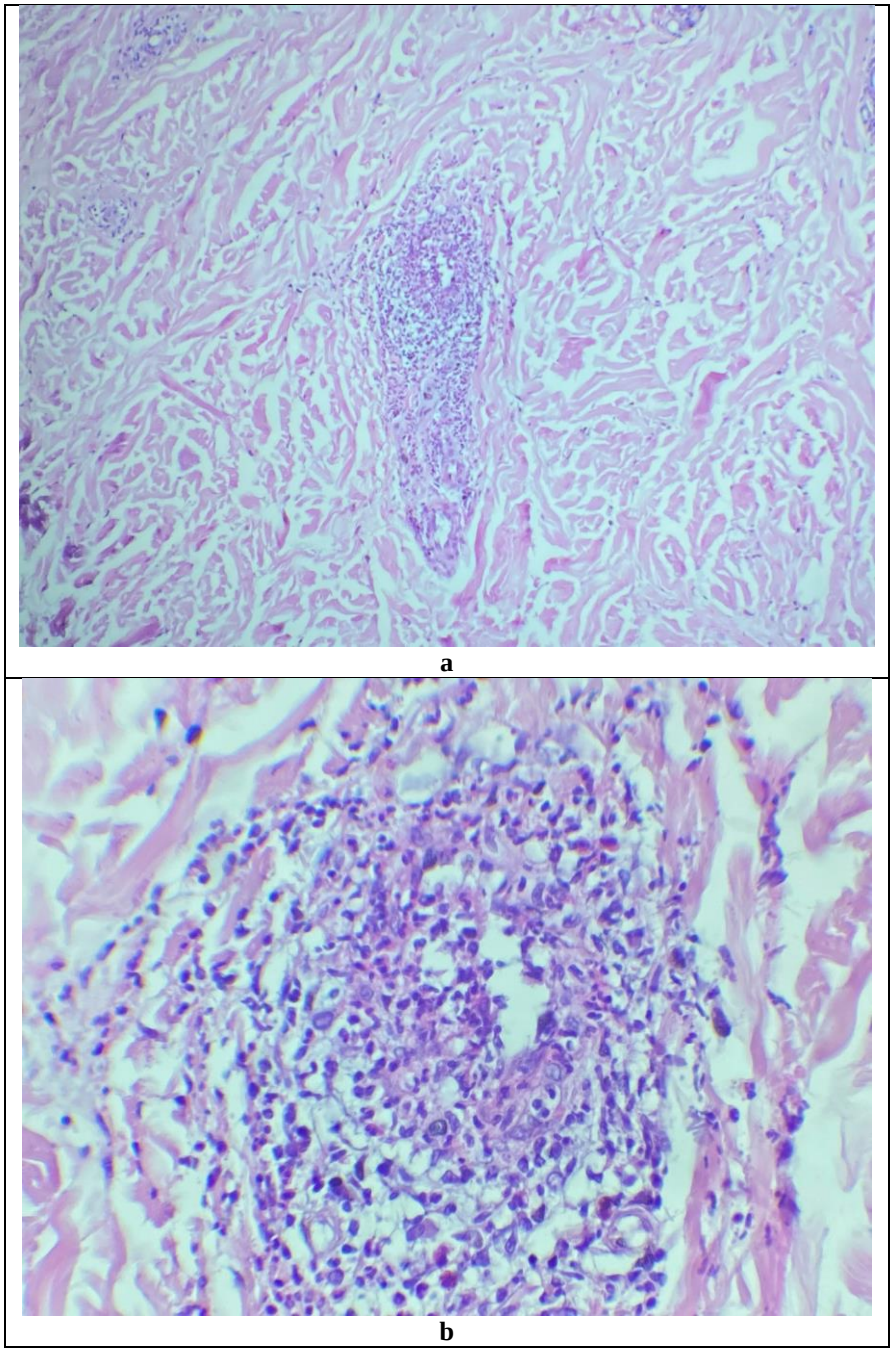


Figure 2: Perivascular inflammatory infiltrate (magnification at x40)



a

b

Figure 3a and b: Inflammatory cells consisting of neutrophils and lymphocytes infiltrating the vessel wall with leucocytoclasia (magnification at x100 and x400)

DISCUSSION

One of the most promising solution to manage the COVID-19 pandemic is vaccination. Like other vaccines, cutaneous side effects to the COVID-19 vaccine have been reported [1, 5]. Local reactions such as erythema, swelling, and urticarial eruptions are the most common cutaneous side effects [6, 7]. Rare vasculitis cases following COVID-19 vaccine have been reported. Only three cases of vasculitides were reported in an international registry of 414 cutaneous reactions following Pfizer-BioNTech, and Moderna vaccines [6]. Leucocytoclastic vasculitis is an exceptional vaccine side effect [8-11]. To our knowledge, only one case following the BNT162b2 vaccine has been reported [10]. The induction of cutaneous vasculitis following infection by SARS-CoV-2 is widely established [12, 13]. The vaccines proteins may release the host immune system and stimulate antibody secretion which will be eventually deposited within the post-capillary venules and trigger an inflammatory cascade leading to vascular endothelium damage and vasculitis [4, 12]. Some comorbid conditions such as advanced age, diabetes mellitus, hypertension, and obesity are associated with

endothelial damage rendering the occurrence of vasculitis after COVID-19 more probable [12]. None of these factors wer found in our patient. The resemblance of the vaccine-induced spike proteins with human components is highly likely to produce pathological autoantibodies and vaccine-induced autoimmunity through molecular mimicry [1].

CONCLUSION

Leucocytoclastic vasculitis is an exceptional side effect of the coronavirus disease. It's likely due to hyperactivation of the immune system secondary to cross reactivity and molecular mimicry between the virus and self-antigens [10]. Healthcare professionals should be aware of this possible complication of the BNT162b2 vaccine to avoid its potentially consequences.

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