Alemtuzumab-induced petechia and epistaxis in a patient with relapsing remitting multiple sclerosis; A case report

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Abstract: This case report presents a 58-year-old woman with Multiple Sclerosis (MS) who developed petechiae and epistaxis, rare side effects following Alemtuzumab treatment. While these reactions are infrequent, heightened awareness among healthcare providers is essential as Alemtuzumab gains popularity in MS treatment. Recognizing and managing such hypersensitivity reactions promptly is crucial for improved patient care. 1.Introduction Multiple Sclerosis (MS) is an autoimmune disease that affects the central nervous system. The course of the disease varies among individuals, leading to a wide range of symptoms and patterns of presentation. Additionally, there are other conditions, such as radiologically isolated syndrome, which can progress to MS(1). While there is no curative therapy for this condition, certain drugs can modify the course of the disease and improve the prognosis and quality of life for patients.

Disease-modifying treatments (DMTs) are the preferred treatment option for patients with MS. Alemtuzumab is an intravenously administered DMT drug that has been available since 2014 for the treatment of patients with multiple sclerosis who have not responded adequately to two or more DMTs. It is a recombinant DNA-derived humanized monoclonal antibody that selectively binds to the CD52 antigen on B and T lymphocytes, depleting them from the bloodstream. This drug has been described as a safe and effective treatment with minimal side effects for patients with relapsing-remitting multiple sclerosis.(2)

While there are few studies on the cutaneous adverse effects of Alemtuzumab, in this study, we report the first case of an MS patient treated with Alemtuzumab who developed drug-induced petechiae and epistaxis.

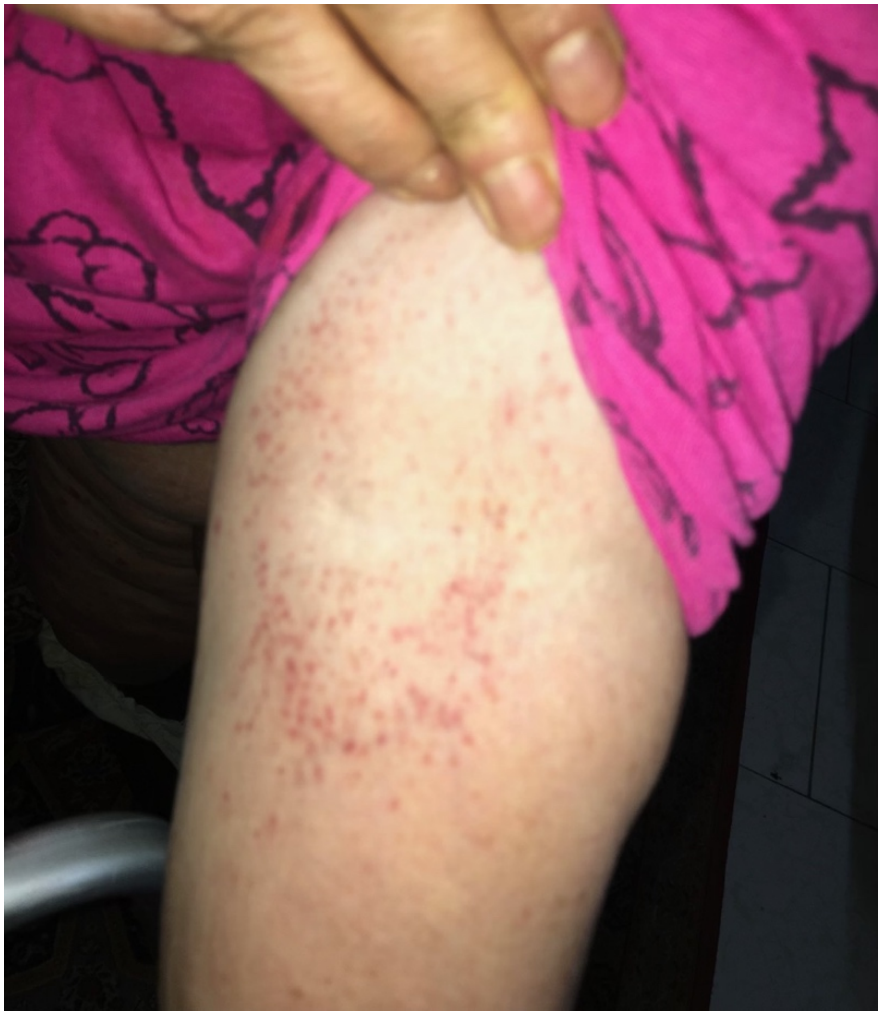
2. Case presentation

A 58-year-old Caucasian woman with relapsing-remitting multiple sclerosis, who had no previous medical conditions, presented to the emergency department due to muscle spasms and stiffness in her right foot. Neurological examination revealed weakness in her right lower limb with 3/5 muscle strength. She was diagnosed with MS at the age of 26 through an MRI and had previously been on weekly Interferon-beta (IFNb) treatment. During acute MS attacks, she received intravenous corticosteroids. Despite being on disease-modifying therapies (DMTs), she experienced more relapses in the last year, and her Expanded Disability Status Scale (EDSS) was 3. During the current hospitalization, the patient underwent brain and cervical spinal MRI, which revealed the appearance of new periventricular white active plaques in addition to previous black old lesions.

Considering the progression of her disease condition, she was started on treatment with Alemtuzumab at a dose of 12mg/day IV. There were no drug reactions, and after completing the treatment, her muscle spasms and stiffness resolved, and the patient was discharged from the hospital.

The day after, the patient came to the hospital to receive the second dose of the drug. While receiving the treatment, her condition remained stable, and she did not experience any notable symptoms. However, one day after finishing the first dose, the patient started to experience a gradual appearance of petechiae on her upper and lower limbs, chest, shoulders, and back. Moreover, a few minutes later, she developed epistaxis. Her blood pressure and heart rate were 127/73 and 87, respectively. The patient denied any previous history of eczema, skin issues, or respiratory allergies.

Dermatology was consulted to investigate the possible causes of petechiae, and ENT was consulted to manage and evaluate the epistaxis. Despite applying pressure to the nostrils and placing ice on the forehead, the epistaxis did not cease. Consequently, the patient underwent posterior nasal packing, which successfully halted the bleeding.



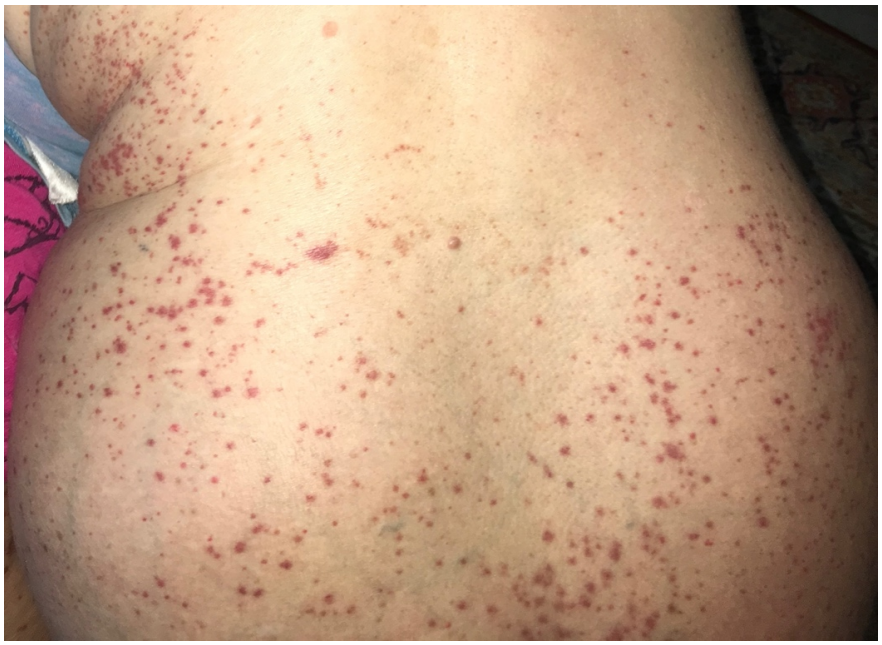


Figure 1 : Cutaneous drug reaction lesions. Petechiae in a 58-year-old Caucasian woman on left antecubital (A) and lower back (B) one day after receiving the second dose of Alemtuzumab.

3. Discussion

Alemtuzumab is known as one of the medications used in patients with relapsing-remitting Multiple Sclerosis who have not responded to other drugs. This medication has some side effects, such as headache, rash, itching, fever, fatigue, hypothyroidism, redness of the face and neck, and more.(3)

There are many underlying causes that can lead to the development of generalized petechiae, including prolonged straining, infectious diseases and adverse effects of medications. Similarly, there are several reasons for epistaxis, such as nose picking, dry air, trauma to the nose, and medication side effects. Laboratory tests and a physical examination of the patient ruled out all of these causes except for the medication's adverse effect.

Adverse skin reactions to drugs typically begin within 12 to 24 hours after exposure.(4)

Cuker et al. reported a case series of six patients with MS treated with Alemtuzumab, resulting in the development of Immune Thrombocytopenia (ITP). Five of these patients achieved complete remission after treatment, while one unfortunately succumbed to the condition, underscoring the need for serious consideration of this adverse effect.(5)

The patient's symptoms manifested one day after receiving the second dose of Alemtuzumab, making a drug reaction a highly plausible explanation for these symptoms. Although rare

To the best of our knowledge, this is the first case report of generalized petechiae and epistaxis following treatment with Alemtuzumab, which was completely resolved after treatment. This case report suggests that Alemtuzumab may induce changes that lead to epistaxis, as nasal bleeding is not routinely observed in MS patients.

4. Conclusion

Generalized petechiae and epistaxis are rare side effects of Alemtuzumab treatment in MS patients. However, as the use of Alemtuzumab in MS treatment increases, healthcare providers should recognize and understand

this adverse reaction pattern to improve clinical management and inform patients about potential adverse effects.

Further research endeavors are imperative to investigate potential underlying factors within the MS patient population that might render them more susceptible to adverse effects such as generalized petechiae and epistaxis following Alemtuzumab treatment.

Declarations

Conflict of Interest

The authors have no conflicts of interest to declare.

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Ethics Approval

The patient has been de-identified. Any images used do not permit the identification of the individual. Otherwise, there are no ethical concerns in this manuscript. There was no ethics approval required for this manuscript.

Consent to participate

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy and with institutional guidelines.

Written Consent for publication

All of the authors have provided their consent to publication.

Availability of data and material

All of the data and material are available

Code availability

Not applicable

Authors' contributions

Farhad Mahmoudi : Conceptualization; investigation; methodology; supervision; writing – original draft; writing – review and editing.**Sayed Ali Emami** : writing – original draft; writing – review and editing. **Farid Masaeli** : writing – original draft; writing – review and editing. **Najmeh Rayatpisheh** : writing – original draft; writing – review and editing.

Reference:

1. Fereidan-Esfahani M, Mahmudi F, Jahansouz M, Weber MS, Rodriguez M. Biomarkers in radiologically isolated syndrome: The missing piece in the puzzle of treatment indication? Journal of the neurological sciences. 2017;375:129.

2. Wilken J, Traboulsee A, Nelson F, Ionete C, Kolind S, Fratto T, et al. Longitudinal assessment of neurocognitive function in people with relapsing multiple sclerosis initiating alemtuzumab in routine clinical practice: LEM-COG study results. Multiple Sclerosis and Related Disorders. 2023;73:104677.

3. Guarnera C, Bramanti P, Mazzon E. Alemtuzumab: a review of efficacy and risks in the treatment of relapsing remitting multiple sclerosis. Ther Clin Risk Manag. 2017;13:871-9.

4. Tempark T, John S, Rerknimitr P, Satapornpong P, Sukasem C. Drug-Induced Severe Cutaneous Adverse Reactions: Insights Into Clinical Presentation, Immunopathogenesis, Diagnostic Methods, Treatment, and Pharmacogenomics. Front Pharmacol. 2022;13:832048.

5. Cuker A, Coles AJ, Sullivan H, Fox E, Goldberg M, Oyuela P, et al. A distinctive form of immune thrombocytopenia in a phase 2 study of alemtuzumab for the treatment of relapsing-remitting multiple sclerosis. Blood. 2011;118(24):6299-305.