Eczematous Reaction to Intravenous Immunoglobulin: An Alternative Cause of Eczema

Report of a Case | A man in his 70s presented with eczematous plaques on his face, trunk, and extremities, including erythema, fissures, and scales on his palms and soles (Figure 1). There were no blisters, erosions, or any mucosal lesions. The patient’s medical history revealed peripheral neuropathy due to Waldenström macroglobulinemia. Several days prior to the onset of skin lesions, he had been treated with high-dose intravenous immunoglobulin (IVIG) (Intratect; Biotest), 1g/kg/d for 2 days, for control of his neuropathy. There was no history of IVIG treatment, atopic dermatitis, respiratory allergies, and/or asthma. His other medications at that time, which had remained unchanged for at least 2 years, consisted of acetylsalicylic acid, simvastatin, and tamsulosin.

A skin biopsy was performed on lesional skin. Histologic analysis showed spongiosis and lymphocytic infiltrates (Figure 2A). No acantholysis was present. Direct immunofluorescent (IF) microscopy showed intercellular deposits of C3 throughout the epidermis and granular deposits along the basement membrane (Figure 2B), but no IgG or IgA was detected. Indirect IF microscopy showed intercellular IgG deposits on monkey esophagus (Figure 2C) but not in rat or monkey bladder epithelium. No IgA deposits were detected in these tissues.

No serum antibodies against desmoglein-1, desmoglein-3, desmocollin-1, or envoplakin were detected by enzyme-linked immunosorbent assay or indirect IF microscopy on transfected HEK293 cells (Euroimmun). Findings of serum antinuclear antibody titers were negative. Initially, topical corticosteroids (class III and subsequently class II) and skin emollients were administered, but the skin lesions persisted.

After switching his treatment regimen to oral methylprednisolone (0.3 mg/kg/d), the patient’s skin lesions cleared within 2 weeks. Following tapering and without any further treatment, no recurrence was observed during a follow-up of 3
years. Further IVIG therapy has been withheld despite persisting neuropathy.

Discussion | One of the differential diagnoses of intercellular deposits of C3 in the epidermis and circulating pemphigus-like IgG autoantibodies is paraneoplastic pemphigus (PNP), but PNP has oral mucosal lesions and is very recalcitrant. Although our patient did not exhibit oral lesions, his eruption quickly responded to oral methylprednisolone. No serum antibodies against envoplakin were detected. Therefore, *atypical pemphigus*, characterized by antibodies against desmocollins with or without anti-desmoglein reactivity,\(^1\)\(^,\)\(^2\) was considered among the differential diagnoses. However, this disease usually demonstrates vesicular or erosive lesions.

Based on clinical examination, direct and indirect IF microscopy, and histologic and laboratory findings, we diagnosed an eczematous reaction due to IVIG treatment. This reaction is often pronounced on the palms and soles (eg, presenting as pompholyx). Usually, topical steroids are effective treatment, but occasionally oral steroids are necessary. In a case series, 13 of 64 patients with this diagnosis underwent skin biopsy.\(^3\) However, to our knowledge, antibodies against epidermal antigens, as in our case, have not been previously reported.

The pathogenesis of the eczematous reaction to IVIG is unknown. Serum complement consumption was reported by Sarmiento et al.\(^4\) The epidermal complement deposits in our patient may provide an explanation: IVIG can act in a manner analogous to a B-cell superantigen; ie, B cells are activated following IVIG therapy.\(^5\)\(^,\)\(^6\) We therefore speculate that activated B cells may produce the antibodies against epidermal antigens. It is unclear why these antibodies were not blister inducing. One possible explanation is that the titer of these circulating autoantibodies was too low.

In conclusion, we report a case of eczema following IVIG treatment for neuropathy caused by Waldenström macroglobulinemia in which for the first time we describe detection of circulating autoantibodies against epidermal antigens in patient serum.

Julia Miyamoto, MD, PhD
Barbara C. Böckle, MD
Detlef Zillikens, MD
Enno Schmidt, MD, PhD
Matthias Schmuth, MD

Author Affiliations: Department of Dermatology, Keio University School of Medicine, Tokyo, Japan (Miyamoto); Department of Dermatology and Venereology, Innsbruck Medical University, Innsbruck, Austria (Miyamoto, Böckle, Schmuth); Department of Dermatology, University of Luebeck, Luebeck, Germany (Zillikens, Schmidt).

Corresponding Author: Matthias Schmuth, MD, Department of Dermatology and Venereology, Innsbruck Medical University, Anichstrasse 35, A-6020 Innsbruck, Austria (matthias.schmuth@i-med.ac.at).


Conflict of Interest Disclosures: None reported.

Additional Contributions: We are indebted to Robert Zangerle, MD, Department of Dermatology and Venereology, Innsbruck Medical University, for valuable discussions and to Lisa Wackerle, Department of Dermatology and Venereology, Innsbruck Medical University, for excellent editorial assistance. These contributors received no compensation beyond that provided in the normal course of their employment.


first, since most patients understand intuitively that a splint or cast is a subcutaneous splint beneath the wound. This accomplishes 3 things: pertrophicscarorkeloid.

cerned that the area will remain everted or that it represents a hypertrophic scar or keloid. Patients, who extrapolate from the immediate postoperative appearance of a surgical site, may be concerned by the immediate postoperative appearance is not a harbinger of a permanent ridge in the future. Second, it highlights that the resolution of the ridge will take weeks, not days, since patients usually associate a splint or cast with a 6- to 8-week healing period. Finally, it explains that the overcorrection of the repair site coupled with eversion is designed to relieve tension across the surface of the wound in order to maximize the chance of healing with a subtle scar, just as a splint or cast is placed to minimize tension across a broken bone to maximize the chance that the fracture will heal appropriately.

My preference is to have this explained 3 times: by the staff when preparing the patient and reviewing dressing changes; in the written handout; and, most important, by the operating surgeon. Outlining and reviewing this phenomenon with patients using an analogy may lead to significantly more retention, less patient anxiety, and increased compliance with the postoperative plan.

Author Affiliations: Perelman School of Medicine, University of Pennsylvania, Philadelphia; Florida Center for Dermatology, P.A., St Augustine.

Corresponding Author: Jonathan Kantor, MD, MSCE, MA, Department of Dermatology, Perelman School of Medicine, University of Pennsylvania, Florida Center for Dermatology, P.A., 105 Southpark Blvd, Ste A-103, St Augustine, FL 32086 (jonkantor@gmail.com).

