

Title

Allergic granulomatous skin reaction to electromyography needle

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A 31-year-old woman had electromyography (EMG) for progressive painless weakness of all extremities. She was diagnosed with multifocal motor neuropathy and received intravenous immunoglobulin. Two days after EMG she developed painful swelling at all needle insertion points with subsequent blistering and granulomatous, non-eczematous eruptions (Figure). The disposable concentric needle electrodes used in the EMG examination consisted of stainless steel, platinum, and palladium. Patch testing was performed on the upper back with the German Contact Dermatitis Research Group (DKG) standard series and the DKG dental metal series.¹ Positive reactions to palladium chloride (1.0% pet.) and ammonium tetrachloroplatinate (0.25% pet.) were observed at 72 and 168 h readings. No positive reactions were observed to any of the other 36 test substances. Sensitization might have occurred some years ago, when she wore a platinum piercing in the left eyebrow, which was removed due to persistent local inflammation.

EMG and nerve conduction studies with needle electrodes may be associated with iatrogenic complications such as bleeding, infection, nerve injury, pneumothorax, urticaria, and complex regional pain syndrome.²⁻⁴ Although metal allergies are a well-known problem,^{5,6} they are probably rare following EMG. We could only find a single report of an EMG-associated allergic contact dermatitis, in which nickel could be identified as the allergen.⁷ In our patient, clinical signs of a delayed type hypersensitivity reaction occurred at all needle electrode insertion points. They appeared as painful swelling and subsequent prominent granulomatous eruptions that persisted for several weeks. It is noteworthy that, unlike typical allergic contact dermatitis, the skin lesions were non-eczematous. Allergic reactions to 2 metals contained in the needle electrodes, platinum and palladium, were proven by patch testing.

Delayed type hypersensitivity reactions are T-cell driven and can include several metals due to cross-reactivity, as in our patient.⁸ Since metal ions are haptens and are considered to be incomplete antigens, protein or peptide binding is needed for immunogenicity. Persistent local inflammation might have facilitated the generation of a metal-specific T-cell response in this patient. Treatment of contact dermatitis includes local steroid therapy and strict allergen avoidance.⁵

In summary, an allergic contact dermatitis to EMG needle electrodes should be considered in patients with previous sensitization and eczematous skin reactions or atypical granulomatous eruptions.

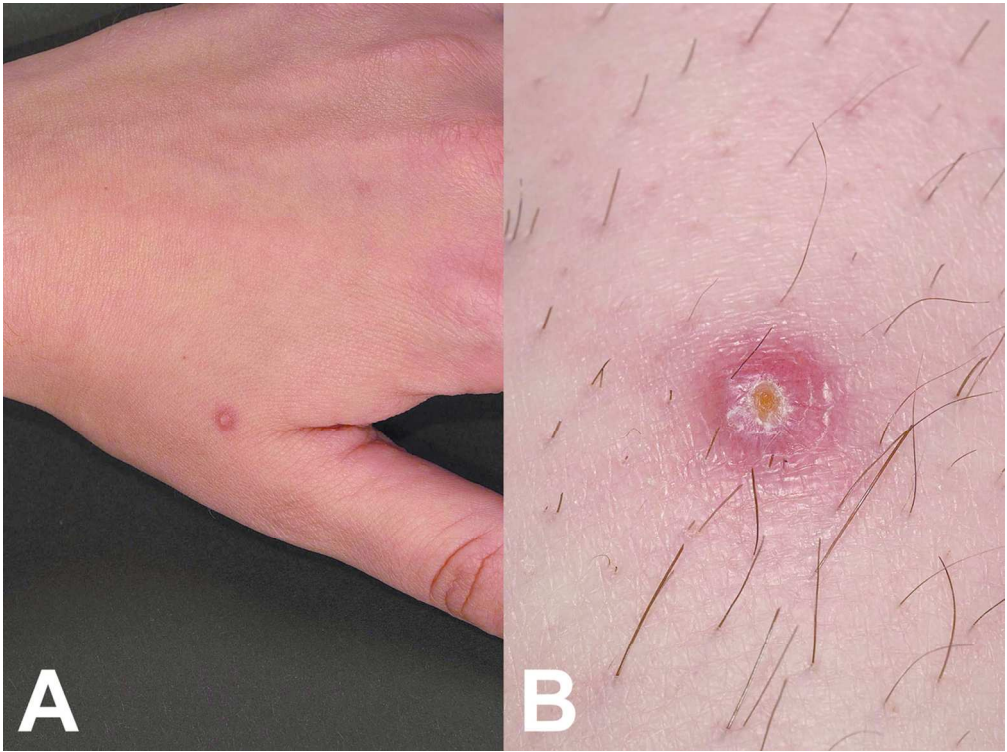
FIGURE LEGEND

Allergic contact granulomas 8 weeks after EMG at points of needle insertion. First dorsal interosseous (A) and tibialis anterior (B) muscle on the left side are shown.

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