

The Potential Utility of Patch Testing in Identifying the Causative Agent of Morbilliform Drug Eruptions

Justin O. Endo, Crystal Davis, and Douglas L. Powell

Précis

Patch testing in cases of morbilliform drug eruption can be helpful.

Case Report

A 45-year-old female with acute myelogenous leukemia was admitted with neutropenic fever after re-induction chemotherapy for leukemic relapse. She was empirically treated with vancomycin, meropenem, and piperacillin-tazobactam. The dermatology department was consulted after she developed fevers and a pruritic generalized morbilliform eruption with petechiae in dependent areas (Fig 1). The petechiae began to fade, but the original eruption subsequently developed darkening and confluence. Her antibiotic was changed again (to gentamicin), and the rash eventually faded. The hematologist was concerned that the patient might need empiric antibiotics in the future if neutropenic fevers developed again. The patient was referred for patch testing to determine which medications could still be used in the future.

Vancomycin, meropenem, and piperacillin-tazobactam were mixed at a compounding pharmacy in 10% petroleum and were used for patch testing in addition to standard screening trays (Chemotechnique Diagnostics, Malmö, Sweden, and allergEAZE, Calgary, Alberta, Canada). Of interest, the patient reported a distant history of morbilliform eruption from lisinopril and had positive reactions to captopril at both the initial and delayed readings (Fig 2A). Likewise, there was a strong reaction to meropenem (see Fig 2B) but no reaction to vancomycin at both readings. The patient was given subsequent cycles of chemotherapy and antibiotics and

PEARLS provide insight into understanding disease pathogenesis or improving treatment. ZEBRAS inform about previously unrecognized conditions or atypical variants of known disorders.

SECTION EDITORS:

Douglas L. Powell, MD
Department of Dermatology
University of Utah
Room 4B454 SOM
30 North 1900 East
Salt Lake City, UT 84132
Tel: 801-581-6465
E-mail: Doug.Powell@derm.med.utah.edu

Matthew J. Zirwas, MD
Division of Dermatology
Department of Medicine
Ohio State University
OSU Dermatology-East
5965 East Broad Street, Suite 290
Columbus, OH 43213
Tel: 614-864-8302
E-mail: matt.zirwas@osumc.edu

has not had further problems since she began avoiding meropenem.

Discussion

The incidence of any type of drug eruption (including morbilliform exanthems in the general population) is 1 to 6% for angiotensin-converting enzyme inhibitors and 1 to 3% for meropenem.¹ Our patient took several medications prior to the eruption's onset, and her medical conditions made medication rechallenge impractical. Patch testing was safely performed and strongly suggested meropenem as the exanthem's cause, and the patient has done well since she began avoiding meropenem. Our literature search found limited experience with carbapenems² and only one report of a relevant positive patch-test result for vancomycin hypersensitivity.³ There were no reports of patch testing with lisinopril.

Due to limited published experiences, the positive predictive value for patch testing in cases of systemic drug exanthems is generally low, whereas the negative predictive

From the Department of Dermatology, University of Utah, Salt Lake City, UT.

Reprints not available.

DOI 10.2310/6620.2011.10063

© 2011 American Contact Dermatitis Society. All Rights Reserved.

DECKER_X





Figure 1. Generalized morbilliform eruptions.

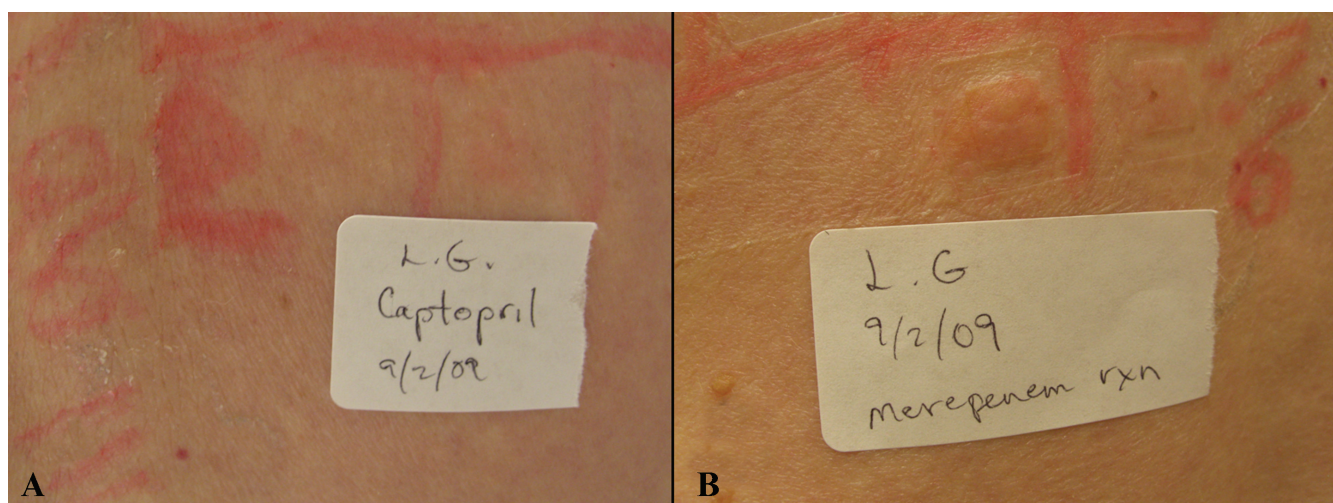


Figure 2. Patch-test readings at A, 48 hours, and B, 96 hours.

value is relatively high. The important exception to this is maculopapular eruptions related to antibiotics, for which positive predictive values are relatively more reliable. This phenomenon could be due to limited published experiences or to the lack of standardized patch-test methods for medications. Recommended methodologies and caveats for patch testing in drug rash cases were highlighted by Cham and Warshaw.⁴

Pearl

Patch testing needs standardization and validation for cases of morbilliform drug eruptions but might be safe for

screening suspected medications in immunocompromised patients who are receiving multiple antibiotics.

References

1. Sodhi M, Axtell SS, Callahan J, Shekar R. Is it safe to use carbapenems in patients with a history of allergy to penicillin? *J Antimicrob Chemother* 2004;54:1155–7.
2. Lammintausta K, Kortekangas-Savolainen O. The usefulness of skin tests to prove drug hypersensitivity. *Br J Dermatol* 2005;152:968–74.
3. Bernedo N, Gonzalez I, Gastaminza G, et al. Positive patch test in vancomycin allergy. *Contact Dermatitis* 2001;45:43.
4. Cham PM, Warshaw EM. Patch testing for evaluating drug reactions due to systemic antibiotics. *Dermatitis* 2007;18:63–77.

Bilateral Symmetrical Contact Dermatitis on the Face and Outer Thighs from the Simultaneous Use of Two Mobile Phones

Esen Özkaya

Précis Bilateral symmetrical lesions on the face and thigh from the use of two mobile phones simultaneously are reported as a novel pattern of mobile-phone dermatitis.

Discussion A 33-year-old Turkish nonatopic man presented with a 1-month history of pruritic symmetrical eczematous patches on both sides of the face (reaching from the preauricular area to lateral parts of the cheek) and on the anterolateral part of each thigh (Fig. 1A, 1B, and 1D). Clinical examination revealed further eczematous lesions on his abdomen corresponding to the contact sites of his belt buckle and the metal punch of his jean trousers (see Fig 1C). There was no history of similar lesions or metal allergy.

The patient was a busy salesperson and was phoning for 3 to 4 hours a day. In the previous 6 months, he had frequently used two mobile phones simultaneously. Each mobile phone was kept in one of the front pockets of his trousers. Both of the mobile phones were of the same brand and had metal casings. The dimethylglyoxime test (Chemo Nickel Test, Chemotechnique Diagnostics, Vellinge, Sweden) revealed evidence of nickel release from the metal casings. The patient was unable to undergo patch testing because of the demands of his job. After he limited the use of the mobile phone and kept it in a belt pouch, the lesions cleared completely with topical corticosteroids within 10 days. He was further advised to use a mobile phone with a nonmetallic casing.

The simultaneous use of two mobile phones with metal casings, the symmetrical eczematous patches on both sides of the face and thigh (corresponding to the sites of contact with the metal phones), the positive dimethylglyoxime test result on the metal casings, and the improvement of the dermatitis with the avoidance of the phones indicated that the metal casings of the phones were probably causing a nickel-induced allergic contact dermatitis. As the patient's history did not reveal previous metal allergy, excessive use of the mobile phones

PEARLS provide insight into understanding disease pathogenesis or improving treatment. ZEBRAS inform about previously unrecognized conditions or atypical variants of known disorders.

SECTION EDITORS:

Douglas L. Powell, MD

Department of Dermatology
University of Utah
Room 4B454 SOM
30 North 1900 East
Salt Lake City, UT 84132
Tel: 801-581-6465
E-mail: Doug.Powell@derm.med.utah.edu

Matthew J. Zirwas, MD

Division of Dermatology
Department of Medicine
Ohio State University
OSU Dermatology-East
5965 East Broad Street, Suite 290
Columbus, OH 43213
Tel: 614-864-8302
E-mail: matt.zirwas@osumc.edu

might have caused sensitization, especially in the presence of coexisting factors such as friction, occlusion, and sweating.

Knowledge about the minimum exposure time required to sensitize and to elicit nickel contact dermatitis from the use of a mobile phone is lacking, as is a scientific definition of long-term skin exposure,¹ but the patient's use of mobile phones for 3 to 4 hours per day was highly excessive.

The number of reports of nickel-induced allergic contact dermatitis from the metallic exterior parts of mobile phones has increased during the last decade.²⁻⁴ Dimethylglyoxime testing was found to be a valuable screening test for nickel release from the metallic parts of mobile phones.¹ Recently, mobile phones have been covered by the European Union Nickel Directive.⁵

Unilateral involvement of the face (including the ear, preauricular area, and cheek, corresponding to the habit of usage) is characteristic of mobile-phone dermatitis.²⁻⁴ Preauricular eczema has been further proposed as a diagnostic sign.³ Recently, an unusual case with lesions on either side of the thigh from keeping the phone in one of the front trouser pockets was reported.⁴

From the Department of Dermatology, Istanbul Medical Faculty, Istanbul University, Istanbul, Turkey.

Reprints not available.

DOI 10.2310/6620.2011.10131

© 2011 American Contact Dermatitis Society. All Rights Reserved.



Figure 1. A and B, Symmetrical eczematous patches on the right (A) and left (B) sides of the face, predominantly involving the preauricular areas. C, Periumbilical and abdominal eczematous patches corresponding to the contact sites of a belt buckle and the metal punch fastener of jean trousers. D, An eczematous patch on the anterolateral part of the right thigh. The left thigh was also involved owing to the patient's practice of keeping each of two phones in a different front trouser pocket.

This appears to be the first reported case of mobile-phone contact dermatitis with symmetrical lesions on both sides of the face and thigh from using two mobile phones at the same time. Symmetrical eczema is mainly indicative of systemic allergic dermatitis; however (as in this case), it might also occur from simultaneous contact of the causative allergen with both sides of the body.

Pearl

This case shows that apart from the common pattern of unilateral face and thigh eczema, mobile-phone dermatitis

might also present as bilateral face and thigh eczema, which has not been reported previously.

References

1. Thyssen JP, Johansen JD, Zachariae C, Menné T. The outcome of dimethylglyoxime testing in a sample of cell phones in Denmark. *Contact Dermatitis* 2008;59:38–42, doi:[10.1111/j.1600-0536.2008.01350.x](https://doi.org/10.1111/j.1600-0536.2008.01350.x).
2. Roberts H, Tate B. Nickel allergy presenting as mobile phone contact dermatitis. *Australas J Dermatol* 2010;51:23–5, doi:[10.1111/j.1440-0960.2009.00580.x](https://doi.org/10.1111/j.1440-0960.2009.00580.x).
3. Lee DY, Yang JM. Preauricular eczema: a sign of cellular phone dermatitis. *Clin Exp Dermatol* 2010;35:201–2, doi:[10.1111/j.1365-2230.2009.03372.x](https://doi.org/10.1111/j.1365-2230.2009.03372.x).

-
4. Guarneri F, Guarneri C, Patrizia Cannavò S. An unusual case of cell phone dermatitis. *Contact Dermatitis* 2010;62:117, doi:[10.1111/j.1600-0536.2009.01674.x](https://doi.org/10.1111/j.1600-0536.2009.01674.x).
 5. Thyssen JP, Johanssen JD. Mobile phones are now covered by the European Union Nickel Directive. *Contact Dermatitis* 2009;61:56–5, doi:[10.1111/j.1600-0536.2009.01551.x](https://doi.org/10.1111/j.1600-0536.2009.01551.x).