



Visual Case Discussion

Foot dermatitis mistaken for cellulitis

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A previously well 28 year old male bought himself a pair of sneakers a week prior to his visit and later that day both of his feet felt irritated. Over the next several days he had increased foot irritation and swelling, which improved at night but worsened during the day as he walked around. The feet were not painful nor itchy, just rubbed on his sneakers and felt irritated. He had no fever, chills, SOB, or chest pain. The skin of his feet and legs were as normal as his hands and arms the day before these new sneakers. He has never had allergy or rashes of any kind previously. He was seen at a hospital 3 days prior to our visit and given Keflex for cellulitis, then did not fill his prescription. The sneakers were his only footwear since purchase. Physical exam findings are visualized in Figs. 1 and 2. The patient was discharged to social



Fig. 2. His new sneakers.



Fig. 1. Note the feet, which have a fine scale almost like powdered sugar, adherent but dry, stopping abruptly in an almost perfect ring in the ankle region. Underlying redness, which extends symmetrically up the lower portion of both legs, with marked swelling. Exam between toes, not pictured, showed no scaling.

services, which provided him shoes prior to his leaving the building.

This is an example of contact dermatitis. Contact dermatitis can be differentiated from atopic dermatitis by the following features that are expected in atopic dermatitis: personal or family history of atopy, early age of onset, chronic and recurrent rash.¹

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.visj.2017.04.012](https://doi.org/10.1016/j.visj.2017.04.012).

Reference

- 1 Bernstein DI. Contact dermatitis for the practicing allergist. *J Allergy Clin Immunol Pract.* 2015;3(5):652–658. <http://dx.doi.org/10.1016/j.jaip.2015.06.006>.

Questions

1. What is the most important aspect of treatment for this patient?
 - a. Provide him new footwear
 - b. Corticosteroids
 - c. Antifungal cream
 - d. Antibiotic addressing gram positive infection
 - e. Emollient therapy
2. What type of hypersensitivity is allergic contact dermatitis?
 - a. I
 - b. II
 - c. III
 - d. IV
3. Which of the following is another hypersensitivity in the same class as allergic contact dermatitis?
 - a. Inflammatory bowel disease
 - b. Goodpasture's syndrome
 - c. Graves' disease
 - d. Rheumatoid arthritis
4. Which of the following is the most common cause of contact dermatitis?
 - a. Nickel
 - b. Gold
 - c. Polyester
 - d. Peanut oil
5. Which of the following is NOT a Type IV hypersensitivity mediated process?
 - a. Koebner Phenomenon
 - b. Hashimoto's Thyroiditis
 - c. Multiple Sclerosis
 - d. Crohn's Disease

Answers

1. Provide him new footwear. Explanation: Allergic contact dermatitis is often difficult to distinguish from irritative contact dermatitis. New footwear is essential in either case. Corticosteroids would be inadvisable in irritative contact dermatitis. Fungus is unlikely.

Moccasin tinea pedis, generally caused by *T. Rubrum*, tends to have a slow onset and little inflammation, though it causes similar scaling, nearly universally with relative dorsal foot sparing. Inflammatory, ulcerative, or vesicular tinea pedis, generally caused by *T. Interdigitale*, can be rapid in onset but causes more vesicles, pustules and/or ulcers of the sole, edge, instep or interdigital areas of the feet if fulminant rather than the adherent widely-distributed scale seen in this case. Simple cellulitis would not show the shoe-top transition, superinfection would less likely be symmetrical and would be more painful and likely accompanied by fever. Emollient therapy is beneficial in more chronic similar scaling rashes, but in this case removal of the offending shoes will probably be sufficient and lead to rapid resolution.

2. IV. Explanation: Delayed type hypersensitivity is type IV hypersensitivity that is a cell-mediated response and antibody independent. Type I hypersensitivity is IgE mediated immediate allergy such as asthma. Response is fast, occurring in minutes. Type II hypersensitivity is cytotoxic or tissue specific hypersensitivity mediated by IgG or IgM. Examples include rheumatic heart disease, Myasthenia Gravis, autoimmune hemolytic anemia, etc. Type III hypersensitivity is immune complex mediated and examples include serum sickness, systemic lupus erythematosus, etc.
3. Inflammatory bowel disease. Explanation: Goodpasture's syndrome and Graves' disease are both types of type II hypersensitivity reactions mediated by antibodies formed against specific antigens. Rheumatoid arthritis is a type III hypersensitivity mitigated by immune complexes and complements.
4. Nickel. Explanation: Allergic contact dermatitis is most commonly noted with nickel when compared to the rest of the options.
5. Koebner Phenomenon. Explanation: Koebner phenomenon is the phenomenon of skin lesions related to a particular disease appearing at previously unaffected sites after cutaneous trauma or irritation (1). The pathogenesis of this phenomenon is unclear but it has been noted with many skin conditions such as psoriasis, lichen planus, vitiligo, etc. This has not been noted with allergic contact dermatitis. Pseudo-koebnerization is noted with toxicodendron dermatitis (poison ivy) or molluscum contagiosum. Here, the linear spread is from direct chemical or infectious agent exposure rather than unrelated trauma or irritation (1). Reference: Sagi L, Trau H. The Koebner phenomenon. *Clin Dermatol.* 2011 Mar-Apr;29(2):231-6. doi: 10.1016/j.clindermatol.2010.09.014.

Question 1:

What is the most important aspect of treatment for this patient? ?

- ☒ Provide him new footwear.

Explanation:

Allergic contact dermatitis is often difficult to distinguish from irritative contact dermatitis. New footwear is essential in either case. Corticosteroids would be inadvisable in irritative contact dermatitis. Fungus is unlikely. Moccasin tinea pedis, generally caused by *T. Rubrum*, tends to have a slow onset and little inflammation, though it causes similar scaling, nearly universally with relative dorsal foot sparing. Inflammatory, ulcerative, or vesicular tinea pedis, generally caused by *T. Interdigitale*, can be rapid in onset but causes more vesicles, pustules and/or ulcers of the sole, edge, instep or interdigital areas of the feet if fulminant rather than the adherent widely-distributed scale seen in this case. Simple cellulitis would not show the shoe-top transition, superinfection would less likely be symmetrical and would be more painful and likely accompanied by fever. Emollient therapy is beneficial in more chronic similar scaling rashes, but in this case removal of the offending shoes will probably be sufficient and lead to rapid resolution.

- ☐ Corticosteroids
- ☐ Antifungal cream
- ☐ Antibiotic addressing gram positive infection
- ☐ Emollient therapy

Question 2:

What type of hypersensitivity is allergic contact dermatitis? ?

- ☐ I

☐ II

☐ III

☒ IV

Explanation:

Delayed type hypersensitivity is type IV hypersensitivity that is a cell-mediated response and antibody independent. Type I hypersensitivity is IgE mediated immediate allergy such as asthma. Response is fast, occurring in minutes. Type II hypersensitivity is cytotoxic or tissue specific hypersensitivity mediated by IgG or IgM. Examples include rheumatic heart disease, Myasthenia Gravis, autoimmune hemolytic anemia, etc. Type III hypersensitivity is immune complex mediated and examples include serum sickness, systemic lupus erythematosus, etc.

Question 3:

Which of the following is another hypersensitivity in the same class as allergic contact dermatitis? ?

☒ Inflammatory bowel disease

Explanation:

Goodpasture's syndrome and Graves' disease are both types of type II hypersensitivity reactions mediated by antibodies formed against specific antigens. Rheumatoid arthritis is a type III hypersensitivity mitigated by immune complexes and complements.

☐ Goodpasture's syndrome

☐ Graves' disease

☐ Rheumatoid arthritis

Question 4:

Which of the following is the most common cause of contact dermatitis? ?

- ☒ Nickel

Explanation:

Allergic contact dermatitis is most commonly noted with nickel when compared to the rest of the options.

- ☐ Gold
- ☐ Polyester
- ☐ Peanut oil

Question 5:

Which of the following is NOT a Type IV hypersensitivity mediated process? ?

- ☒ Koebner Phenomenon

Explanation:

Koebner phenomenon is the phenomenon of skin lesions related to a particular disease appearing at previously unaffected sites after cutaneous trauma or irritation (1). The pathogenesis of this phenomenon is unclear but it has been noted with many skin conditions such as psoriasis, lichen planus, vitiligo, etc. This has not been noted with allergic contact dermatitis. Pseudo-koebnerization is noted with toxicodendron dermatitis (poison ivy) or molluscum contagiosum. Here, the linear spread is from direct chemical or infectious agent exposure rather than unrelated trauma or irritation (1).

Reference:

1. Sagi L, Trau H. The Koebner phenomenon. Clin Dermatol. 2011 Mar-Apr;29(2):231-6. doi: 10.1016/j.clindermatol.2010.09.014.

- ☐ Hashimoto's Thyroiditis

☐ Multiple Sclerosis

☐ Crohn's Disease