Osteopathic Family Physician (2013) 5, 86-89

ELSEVIER

acofp Osteopathic Family Physician

Subacute eczematous inflammation in the lower extremity: A mixed picture of stasis dermatitis, granuloma annulare, and contact dermatitis

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KEYWORDS:
Stasis dermatitis;
Granuloma annulare;
Contact dermatitis

Granuloma annulare and stasis dermatitis are two common cutaneous disorders encountered by primary care physicians. Stasis dermatitis is an inflammatory skin disorder and is often seen in patients with chronic venous insufficiency. Similarly, granuloma annulare is a benign inflammatory disorder of the skin that is typically self-limiting and seen in all age groups. These disorders can be mistaken for other diseases and exacerbated by certain medications, leading to irritant or allergic contact dermatitis. We present the case of a 52-year-old white male who presented to the clinic with bilateral lower extremity edema, erythematous papules, and brown discoloration. The typical clinical presentation of granuloma annulare, subacute eczematous stasis dermatitis, and contact dermatitis, as well as treatment options, will be reviewed in this case study.
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Case report

A 52-year-old white male with a medical history of a brain aneurysm, chronic hepatitis C, and venous insufficiency presented to the clinic with a four-month history of rash on his legs with insidious onset. He also admitted to a history of lower extremity edema for the previous 10 years. A month before the rash developed, the patient experienced trauma to the left shin from bumping his leg into a lead pipe at work. A month later, the patient presented to our clinic with an erythematous, warm, and tender lesion over his left shin at the trauma site and was treated with ceftriaxone 1 g intramuscularly and cephalexin 500 mg twice per day to treat cellulitis of his shin. One week later, the patient reported the tenderness of the lesion had resolved, yet he returned to our clinic because of the ongoing rash.

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Upon physical examination, the patient presented with bilateral lower extremity edema, erythema, and brown discoloration with pruritus and excoriations over the anterior shins (Fig. 1). This rash extended from just below the kneecap to the medial malleoli bilaterally and appeared more erythematous than it had the previous week. There were also brown macules and red papules around the periphery of the erythematous patches in the proximal anterior right leg, as well as overlying signs of disruption of the normal skin barrier in areas of excoriations. No subjective pain was reported, nor was there pain upon palpation. The patient had full range of motion in his lower extremities and Homan sign was negative bilaterally. The pedal pulses were 3+ bilaterally and the skin was cool to touch.

Many differential diagnoses were possible in this clinical scenario. Possible etiologies included infection, connective tissue disease, and metabolic or allergic causes. Likely differentials were stasis dermatitis, allergic contact dermatitis (ACD), cellulitis, deep vein thromboses (DVT), erythema

1877-573X/$ -see front matter © 2012 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.osfp.2012.06.002

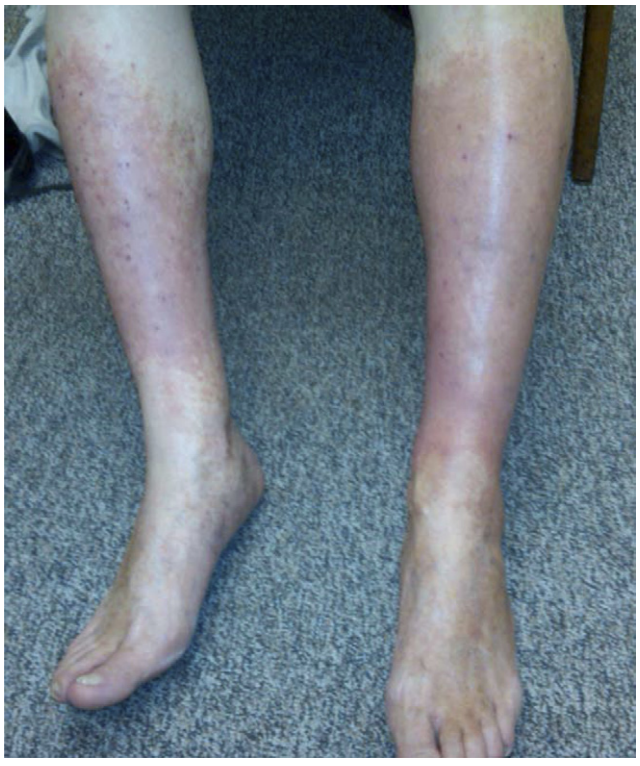

Figure 1 Stasis dermatitis with superimposed granuloma annulare confounded by ACD in a 52-year-old white male. Enhanced view of erythematous papules and patches with central depression of granuloma annulare and secondary excoriations.

nodosum, and necrobiosis lipoidica diabeticorum (NLD), among others. Given the patient's symptoms and clinical setting, bilateral DVTs were low on our differential and thus a lower extremity Doppler examination was not performed. Erythema nodosum, a cutaneous manifestation of sarcoidosis, was also on our differential given the erythema and tenderness of the lower extremity lesions. NLD, a disorder of collagen degeneration that commonly presents on the shins, can also present with lower extremity erythema and hyperpigmentation. Given the patient's history of hepatitis C, a diagnosis of prurigo nodularis was considered. Lichen simplex chronicus, caused by excessive irritation or scratching of the skin, was also a potential diagnosis.

Given the patient's history of venous insufficiency, the physical examination findings of lower extremity edema and stasis changes fit the clinical scenario of stasis dermatitis; however, the etiology of the subacute onset was still to be determined. In an effort to identify the maculopapular lesions and given the subacute nature of the dermatoses in his legs, two 2-mm punch biopsies were obtained. The first biopsy was taken from an erythematous patch in his left leg and the second was taken from a maculopapular lesion in his right leg. The first biopsy revealed superficial perivascular lymphocytic infiltrate along with siderophages consistent with stasis changes. The second biopsy site revealed interstitial lymphohistiocytic infiltrate consistent with granuloma annulare. In addition, a periodic acid-Schiff (PAS) stain was negative for fungal hyphae. The histologic diagnosis of stasis dermatitis fit the clinical picture; however, this was an unusual presentation of granuloma annulare, a diagnosis we had not considered in our differential.

Adding to the complexity of this case, the patient admitted to using triple antibiotic ointment (bacitracin, neomycin, and polymyxin B) on his legs for three weeks to attempt to alleviate the erythema and pruritus. However, he recalled the symptoms becoming much worse after use of the topical antibiotics, as was evident by the patches of erythema in the area of distribution of the topical antibiotics. Several studies have documented that ACD to topical antibiotics is more common in patients with chronic venous insufficiency, chronic otitis externa, postoperative or posttraumatic wounds, and chronic eczematous conditions.[1] Given the patient's history of venous insufficiency and previous shin trauma, ACD was likely after use of the topical antibiotic ointment.

Diagnosis

After seeing patients with a lower extremity rash in this distribution, other potential diagnoses should be considered. Common differential diagnoses include contact dermatitis, atopic dermatitis, cellulitis, dermatophyte infection, pretibial myxedema, DVT, and lichen simplex chronicus. Other differentials such as sarcoidosis and NLD should be ruled out as well. Given that our patient had no pulmonary symptoms and previous chest radiographs and blood tests were unremarkable, sarcoidosis was also low on our differential. Furthermore, given the clinical appearance of the lesion and the fact that neither the patient nor his family had a history of diabetes, a diagnosis of NLD was unlikely. Of note, a PAS stain was also negative for fungal hyphae, ruling out this infectious etiology. In addition, the patient was afebrile, his shins were cool to the touch, and his white blood cell count was within normal limits, rendering cellulitis unlikely. Because the rash was more macular and did not manifest any nodules, a diagnosis of prurigo nodularis was unlikely. His thyroid hormone levels were within normal limits and the clinical symptoms did not match DVT. In addition, lichenification of the epidermis was not present. However, the topical antibiotics that the patient applied had exacerbated the inflammation from the subacute stasis changes. The patient applied topical antibiotics to all of the affected areas, including the popliteal fossa; thus a localized rash developed likely due to an ACD.

Discussion

Stasis dermatitis is an eczematous skin eruption that occurs on the lower extremities and can be acute, subacute, or chronic and recurrent.[2] Subacute inflammation typically be-

gins in the winter months when the legs become scaly and dry. Often the etiology is caused by venous incompetence from either DVT, a history of lower extremity injury, pregnancy, or vein stripping.[3] The rash typically has an insidious onset and can be intensely pruritic. The pruritus leads to eczematous inflammation, which leads to breaks in the skin barrier and potential secondary infections. Upon physical examination, progressive pigment changes, such as brown discoloration, can occur. This is a result of extravasation of red blood cells and hemosiderin deposition within the cutaneous tissue commonly caused by increased hydrostatic pressures.[3] Our patient had a 10-year history of lower extremity edema with brown macules present for several months. His history of venous insufficiency along with his history of trauma to the left shin was a likely cause of his stasis changes.

Granuloma annulare is a benign and typically self-limiting skin disorder that occurs in all age groups. The duration of the skin eruption varies and can resolve in a few months to a few years. The cause of granuloma annulare is unknown, but it has been reported to follow trauma, malignancy; viral infections (including HIV, Epstein-Barr virus, and herpes zoster); insect bites; and tuberculosis skin tests.[4] The four main clinical variants of granuloma annulare are localized, disseminated, subcutaneous, and perforating. Localized granuloma annulare begins as a ring of small, firm, flesh-colored or red papules that can eventually coalesce into plaques with an area of central induration.[4] In our patient, only localized lesions were present in the proximal right leg. However, the lesions were obscured by the erythema from the ACD. Granuloma annulare can be mistaken for other common skin conditions such as psoriasis, *Tinea corporis*, *Pityriasis rosea*, and nummular eczema. The lack of any surface changes to the skin is the key feature that distinguishes granuloma annulare from other skin conditions.[4] There is no scaling, associated vesicles or pustules with granuloma annulare, and the skin surface is smooth, which was how our patient presented.

Confounding the underlying skin changes in the lower extremities was an ACD. Patients with venous insufficiency are more prone to secondary skin infections and cutaneous ulcers, often requiring the chronic use of topical antibiotics. After adjusting for confounders such as sex, age, and atopic dermatitis, leg stasis can significantly increase the risk for ACD against distinct allergens.[1] Patch testing is a commonly used diagnostic modality in such patients to detect their specific allergies.

In patients presenting for patch testing in select tertiary referral centers in North America over the last 20 years, the prevalence of ACD to neomycin and bacitracin ranged from 7.2% to 13.1% and 1.5% to 9.1%, respectively.[1] Several studies have established that individuals with chronic venous insufficiency have an increased rate of sensitization to any product used on the legs.[5] This similar reaction was noted in our patient's legs after his use of topical antibiotic cream containing bacitracin, neomycin, and polymyxin B. Moreover, topical antibiotics are not always needed and white petrolatum gel can be just as effective. Some studies have found no significant difference in the incidence of infection or healing between those treated with bacitracin ointment and those treated with white petrolatum.[6]

Management of stasis dermatitis, granuloma annulare, and contact dermatitis can be achieved through the primary care physician's office and does not typically require a trip to the dermatologist. Localized granuloma annulare is self-limiting and asymptomatic, and treatment is usually not necessary. Some retrospective studies have shown that phototherapy with oral psoralen and UV-A (PUVA) is an effective treatment for generalized granuloma annulare.[7,8] Some systemic medications have been attempted with variable success. Recent studies have shown success of intralesional corticosteroid injections into the elevated border in combination with topical steroids.[4,8]

Whena patient with lower extremity skin changes presents to the primary physician's office, it is imperative to review when cases should be considered for further investigation and referral. Indications for referral include[3]: nonhealing ulcers, uncertainty in diagnosis, associated arterial insufficiency, persistent stasis dermatitis, and superficial venous surgery. If ACD is suspected, a patch test is a clinical adjunct in diagnosing the specific allergens that cause the cutaneous reaction.

To manage our patient, we advised him to stop using the topical antibiotics and we prescribed 0.1% triamcinolone ointment to be applied twice per day to the legs for no longer than two weeks at a time to prevent skin atrophy and discoloration. We also prescribed compression stockings for the lower extremities and recommended he keep his skin hydrated with plain white petrolatum, which is free of any cutaneous sensitizers. Osteopathic manipulative therapy (OMT) was also performed on the patient in the form of thoracic inlet technique, rib raising, redoming of the abdominal diaphragm, and the pedal pump to help treat the edema.

Two weeks after the patient began treatment, significant clearing of the erythema and a reduction in the lower extremity edema was noted. The patient was advised to continue using the compression stockings during the day, elevate his legs at night, and continue applying the white petrolatum to prevent xerosis. Consequently, clinicians must be clinically suspicious if patients present with nonhealing rashes. This was evident in our patient's case because stasis dermatitis and ACD can appear to be morphologically similar.[9] In addition, clinicians should note that the symptoms of ACD may be masked by the skin changes involved with venous insufficiency. A thorough patient history, physical examination, and workup should be initiated for the presence any rash of unknown etiology. Moreover, it is imperative to determine a list of differential diagnoses in these instances, monitor for unusual presentations, and pursue further clinical testing if necessary.

Review

Stasis dermatitis	Granuloma annulare	Contact dermatitis (allergic)
Differential: Contact dermatitis, atopic dermatitis, cellulitis, dermatophyte infection, pretibial myxedema, DVT, and lichen simplex chronicus.	**Differential:** Psoriasis, sarcoidosis, *Tinea corporis*, *Pityriasis rosea*, lichen planus, and nummular eczema.	**Differential:** Atopic or nummular dermatitis, drug reaction, scabies.
History and physical examination: Assess for history of venous insufficiency, trauma, xerosis, and signs of secondary infection, erythema, scaling, pruritis, edema especially on anterior shin and malleoli, hyperpigmentation.	**History and physical examination:** Papules and annular plaques with central depression, commonly on dorsum of hands, legs, elbows, and feet.	**History and physical examination:** Exposure to allergens including at workplace or participating in hobbies, history of atopic dermatitis or stasis dermatitis, exposure to medications. Erythematous, scaling, papules, and vesicles at site of contact with allergen. Chronic exposure causing lichenification and scaling.
Treatment: A combination of 0.1% triamcinolone ointment twice per day for 2 weeks, compression stockings, and plain white petrolatum gel can help relieve symptoms. For lower extremity edema: OMT can increase resorption of fluids, increase circulation and respiration, and decrease proteins in the interstitium, lessening the severity of the edema.[10]	**Treatment:** Reassurance, typically self-limiting; localized-intralesional or potent topical steroids, cryotherapy. Generalized PUVA light therapy prednisone, oral retinoids.	**Treatment:** Allergen avoidance for acute cases; oral antihistamines, potent topical steroids, or systemic prednisone for severe cases.

References

1. Gehrig KA, Warshaw EM: Allergic contact dermatitis to topical antibiotics: epidemiology, responsible allergens, and management. J Am Acad Dermatol 58:1-21, 2008
2. Habif TP: Clinical Dermatology. Philadelphia: Mosby, 2004, pp. 72-73
3. Ferri F: Ferri's Clinical Advisor 2012. St. Louis: Mosby, 2011, p. 964-965
4. Cyr PR: Diagnosis and management of granuloma annulare. Am Fam Physician 74:1729-1734, 2006
5. Saap L, Fahim S, Arsenault E, et al: Contact sensitivity in patients with leg ulcerations: a North American study. Arch Dermatol 140:1241-1246, 2004
6. Smack DP, Harrington AC, Dunn C, et al: Infection and allergy incidence in ambulatory surgery patients using white petrolatum vs bacitracin ointment. A randomized controlled trial. JAMA 276:972-977, 1996
7. Fernández-Antón Martínez C: Generalized granuloma annulare: A therapeutic challenge. Our experience in 12 patients. J Am Acad Dermatol 64:Issue 2, Suppl 1., 2011
8. Barankin B, Freiman A, Notes D: Clinical Dermatology Pocket Guide. Philadelphia: F. A. Davis Company, 2006.
9. Perrenoud D, Ramelet AA: Chronic leg ulcers and eczema. Curr Probl Dermatol 27:165-169, 1999
10. Kuchera ML. Lymphatics. In Ward RC, Hruby RJ, et al (editors). Foundations of Osteopathic Medicine. 2nd ed. Philadelphia: Lippincott Williams & Wilkons; 2003:p.786-808.