Research Paper

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A Common Presentation to Learn Uncommon Differential Diagnoses

Medical Science

KEYWORDS : Irritant contact dermatitis, turpentine oil, diclofenac gel, differential diagnoses.

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ABSTRACT

Irritant contact dermatitis is a very common disorder seen secondary to common allergic substances like nickel, black rubber, parthenium, cosmetics, detergents and few drugs. Some patients may also represent fixed drug eruptions to antibiotics, iodine, penicillin and so on. Here, we present a case report of a patient who developed irritant contact dermatitis to topical application of diclofenac gel formulation containing 3% turpentine oil. Specificity for publishing this case is to highlight that a common presentation of skin lesions can mislead us to diagnose any of the possible differential diagnoses, which were listed in this article as overview, would be worth enough in learners' point of view.

INTRODUCTION:

A 45 year old male, shopkeeper by occupation, presented with the complaints of multiple fluid filled lesions over back, sides of abdomen, left thigh and left knee joint. Patient gave history of application of diclofenac gel two times a day for 3 days over back for his back pain. These lesions were associated with pain and burning sensation. He was not a known diabetic or hypertensive. There were no complaints of any systemic illness.

General examination revealed well built, well nourished, an otherwise normal healthy male presented with the cutaneous features of multiple erythematous, tense vesicles to bulla presenting over both normal and erythematous, edematous skin. Similar type of lesions were present in groups over the back [figs. 1 & 2], sides of back, both sides of trunk [figs 3, 4 & 5] and left knee joint [fig 6]. There were few yellow and greenish plaques adherent to the vesicles. Patient applied a paste of turmeric and neem leaves after the onset of vesicles [figs. 1, 2 &6]

Interestingly, patient also gave history of similar lesions over his left thigh, which he developed due to spillage of diclofenac gel from the tube in his pocket.

There was no history of similar complaints in the past. He used topical medications on and off in the past without any allergic reactions. Hence his topical medication was checked for any additional contents. The contents in the tube were: [fig 7]

1. Diclofenac diethylamine 1.16% w/w equivalent to diclofenac sodium 1.0% w/w
2. Mephensin 5% w/w
3. Menthol 2% w/w
4. Methyl salicylate 5% w/w
5. Turpentine oil 3 % w/w in gel base.

All the contents were checked for their irritability and was concluded with the etiology of turpentine induced irritant contact dermatitis (ICD) in this patient.

He was advised to stop the medication and he denied consent for further investigations like skin biopsy and also denied the procedure of patch testing when he was counseled about the probable outcome of allergic reactions in his back after testing. Since the patient denied all such investigations, he was advised treatment with injection dexamethasone 8 mg once a day for 5 days with oral antibiotics, tablet pantoprazole 40 mg once a day with antihistamines and topical fusidic acid ointment for 5 days.

On the follow up period after two weeks, there was complete resolution of his lesions with no complaints of pruritus or any new lesions. He was advised to avoid topical diclofenac and turpentine oil application lifelong.

DIFFERENTIAL DIAGNOSES:

Interesting about the patient's presentation is that we can consider a lot of differential diagnoses with only the cutaneous features such as follows:

1. Dermatitis medicamentosa
2. Disseminated eczema
3. Disseminated herpes simplex
4. Multidermatomal herpes zoster
5. Id reactions or dermatophytid reactions
6. Insect bite reaction
7. Poison ivy/Poison oak/sumac
8. Caterpillar dermatitis
9. Mercury chronic toxicity/poisoning
10. Inflammatory type dermatophyte infections
11. Pemphigus vulgaris
12. Bullous pemphigoid
13. Bullous lupus erythematosus
14. Pustular psoriases
15. Darier's disease
16. Paraneoplastic pemphigus
17. Transient acantholytic disorder
18. Linear Ig A disease
19. Dermatitis herpetiformis
20. Epidermolysis bullosa simplex
21. Phytophoto dermatitis
22. Drug induced photodermatitis
23. Phototoxic reactions
24. Photoallergic reactions
25. Bullous fixed drug reactions
26. Bullous lichen planus
27. Vesicular lichen planus
28. Lichen planus pemphigoides

29. Erythema multiforme
30. Diabetic bullae
31. Porphyria cutanea tarda
32. Spongiotic dermatitis
33. Amyloidosis
34. Nutritional deficiencies : Pellagra
35. Borderline tuberculoid Hansen disease with type I reaction
36. Bullous erythema nodosum leprosum

Rarely:

37. Scabies with secondary infection or id eruption
38. Pseudo-porphyria cutanea tarda
39. Frictional blisters
40. Textile dermatitis
41. Epidermolysis bullosa acquisita

In children:

42. Staphylococcal scalded skin syndrome
43. Bullous impetigo
44. Bullous ichthyosiform erythroderma
45. Bullous arthropod bite reaction
46. Mastocytosis
47. Steven-Johnson syndrome
48. Incontinentia pigmenti
49. Toxic epidermal necrolysis
50. Congenital syphilis
51. Chronic bullous disease of childhood
52. Congenital erythropoetic porphyria
53. Erythropoetic protoporphyria variant
54. Hepatoerythropoetic porphyria

Skin biopsy:

Histopathology is of limited value in diagnosing contact dermatitis. Findings depend on the stage of the process and the nature of the contact. Most types of eczema show similar histopathologic changes and cannot be distinguished with certainty.

DISCUSSION:

DICLOFENAC

This arylacetic non-steroidal anti-inflammatory drugs (NSAID) was reported as the cause of here cases of contact allergy. A 2.5% petrolatum patch test concentration was used. [1] Diclofenac sodium and diclofenac diethylamine tested at 10% in petrolatum produced delayed positive patch test reactions. [2] Diclofenac is in the arylacanoic acid group, which also includes bufexamac, mefenamic, meclofenamic, flufenamic, tolfenamic and etofenamic acids. Diclofenac has also caused contact dermatitis when used as an ophthalmic preparation. [3]

Diclofenac, applied as Voltaren Emulgel in a Spanish patient, resulted in dermatitis in the areas of application. Those areas were sun exposed and subsequent patch testing found that there were no reactions to 1% diclofenac or the commercial product, but photopatch tests of the same two items with 5J of Ultraviolet (UVA) light produced strong reactions indicating photoallergic contact dermatitis. [4]

MEPHENSIN

Degreef and colleagues [5] described five patients who used a mephensin-containing ointment) gad acute contact dermatitis with an id-like spread and features resembling erythema multiforme. Patch tests were performed in four patients and because mephensin was the common allergen in each case, the investigators assumed this allergen was also the cause of the erythema multiforme-like lesions.

MENTHOL

Menthol is used as a flavoring agent, as a component of zinc oxide-eugenol cements and as a mint flavoring and cooling agent in toothpastes and mouthwashes, cough drops, candy, chewing gum, food, cigarettes, liqueurs and mixed drinks. Papa and Shelley [6] described dermatitis, cheilitis and stomatitis from menthol. They also described a case of menthol hypersensitivity that produced a chronic urticaria and a diagnostic basophil response.

Morton and colleagues [7] presented data on 12 patients with oral symptoms and allergy to menthol and/or peppermint. Allergic manifestations include burning mouth syndrome, oral ulcers and oral lichen planus.

METHYL SALICYLATE

Methyl salicylate, the active ingredient in oil of winter-green, is present in many over-the-counter liniments used for the treatment of muscle aches and bursitis but is usually not formulated into prescription drugs. Hindson [8] reported that an ointment containing methyl salicylate sensitized a man whose eruption flared when he took aspirin.

TURPENTINE

(gum turpentine, oil of turpentine, spirit of turpentine, gum spirit, pine resin gum, wood turpentine and sulfate wood pulp waste)

Oil of turpentine, a variable mixture of numerous terpenoid compounds, is derived from various sources, such as balsam of pine trees and is a by-product in the manufacture of sulfate cellulose. The main components are alpha-pinene, beta-pinene, delta-3-carene and dipentene (limonene). These are monoterpenes with a common chemical formula of $CH_{10}H_{16}$. The eczematogenic effect of 3-carene depends on its hydroperoxide content.

Turpentine is the ingredient in many "liniments", cold remedies and veterinary medications. Turpentine oil is regarded as a local irritant. Medically, it is used externally as a counterirritant. Cronin [9] reported that turpentine oil has become an infrequent allergen because of its replacement by the petroleum product white spirit and its deliberate exclusion from industrial products and because the balsam oils used now do not contain the sensitizer α-carene.

Dooms-Goossens [10] and colleagues reported a case of turpentine-induced hypersensitivity to peppermint oil owing to the sensitizing properties of three ingredients, d-pinene, limonene and phellandrene. These compounds are also found in turpentine oil.

Turpentine is extracted from species of pine. The irritant and sensitizing potential vary from country to country. An individual who is sensitized may show crossreaction with balsam of Peru, benzoin, ragweed oil, chrysanthemum and pyrethrum. The most commonlyused products containing turpentine include varnishes, sealing wax, paint thinners and dry-cleaning materials. Freshly distilled turpentine is less antigenic than turpentine that has been stored and become oxidized. The principal sensitizer in turpentine is a careen; pinene and limonene (dipentene) may be less potent sensitizers. [11] Alpha-pinene is the principal constituent of oil of turpentine, which is obtained from members of the order Coniferae.

The sources of exposure to turpentine are mentioned in the following table.

TABLE :

Forms	Substances

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Polishes	Automobile, metal, porcelain and metal, shoe, stove, wood furniture
Preservatives	Paintbrush, wood Bird
Repellants	Paste
Waxes	Liquid soaps, soap powders, bath oils,
Cosmetics	emollient creams, hair and hand tonics, hand lotions, talcum powders, suntan preparations
Cleansers	Metal, general-purpose industrial soaps
Insecticides	Products with pine oil, tree sprays, dairy stock sprays, floral garden pests, grubs, mites, moths, ticks, flies and aphids,
Deodorizers	preparations for dog, cat fleas and lice
Paints	Cleanser type
Solvents and thinners	Including anticorrosion paints For paints, dry cleaners and waxes
Varnishes, shellacs and lacquers	Solvent for resins
Dutch drops	Proprietary remedy for colds and fever
Shoe polish	
Eyeglass frames	
Substances that may cross react with turpentine	Ragweed, chrysanthemum and pyrethrum (in disinfectants, insecticides, fungicides, soil conditioners, wood preservatives, repellents, dog and cat soaps)

Turpentine is both a primary irritant and a sensitizer. As an irritant, it usually acts by defatting the skin and causing dryness and fissuring. Old, oxidized turpentine is more irritating and sensitizing than is the freshly made product. When turpentine is allowed to stand, especially with exposure to light, oxidation results in the formation of formic acid and aldehydes. Pinenes and limonene, which are also formed in the oxidation process, may cause allergic sensitization and cross react with the oils in orange peels and other essential oils.

The residue remaining after distillation of crude oil of turpentine is rosin or colophony, which consists mainly of abietic acid and 1-pinearic acid. Rosin obtained from turpentine is present in many adhesives and may cause dermatitis in sensitized individuals.

Turpentine allergy: [12]

(a) was found to be significantly less frequent in men and in patients with occupational dermatitis,
(b) showed no difference in its association with atopic dermatitis,
(c) patients with turpentine allergy had significantly less symptoms of the hands, more symptoms of the legs or in the face and
(d) were significantly more often aged over 60 years.

Also, patients sensitized to turpentine had increased rates of additional sensitizations.

Toxic effects of turpentine ingestion include headache, insomnia, coughing, vomiting, hematuria, albuminuria and coma. Turpentine, if inhaled can also affect systemic functions resulting in irritation of the respiratory pathways. [13] A case report documents a male, 20 years of age treated with oxygen, steroids, and eventually intercostal tube drainage after turpentine-induced chemical pneumonitis that evolved into a bronchopleural fistula. [14]

Dudek et al [15] reported a case of a 27-year old art painter using turpentine as a thinner for oil-based paints and developed asthmatic reactions after 5 years of working with turpentine.

CONCLUSION

There were systemic manifestations reported allergic to turpentine intoxication in the literature [14,15] but our case probably be the rare case report to be reported for the manifestation of cutaneous irritant contact dermatitis caused secondarily to the application of turpentine oil in a case of low back pain patient. Thereby, as dermatologists we should be cautious enough to suspect contact dermatitis to very common medications also, very uncommonly.

FIGURES

Fig 3: ICD in the right side of trunk

Fig 4: ICD in the left side of trunk

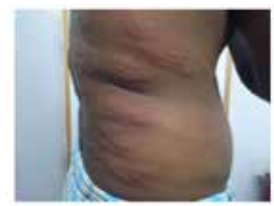
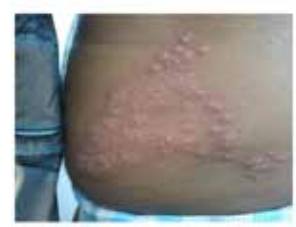


Fig 5: Closer view of lesions in left side of trunk

Fig 6: ICD in left knee joint



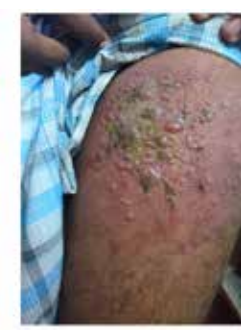


Fig 5: Closer view of lesions in left side of trunk
Fig 6: ICD in left knee joint

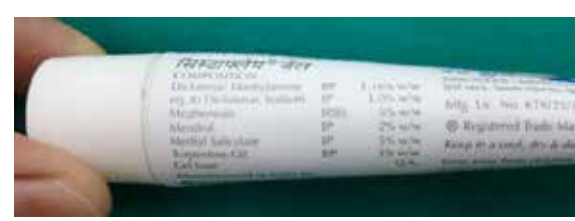


Fig 7: Contents in the topical formulation

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