

Allergic contact hobby dermatitis from turpentine

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ABSTRACT

Introduction: Turpentine is an oleoresin obtained from various species of pine. It contains a volatile oil (oil of turpentine) which is responsible for its properties and this is the form generally used. Opportunity for contact with turpentine is widespread. It is universally used as a solvent to dissolve and thin lacquers, varnishes and paints. It is also an ingredient in many liniments and cold remedies. Turpentine is regarded as both a local irritant and a sensitizer. Cases of allergic contact dermatitis in painters, mechanics, shoe repairers and home decorators have been reported.

Case report: We report a case of a non-professional painter who developed a contact allergic dermatitis due to his exposure to turpentine while doing oil-painting as a hobby.

Discussion: Dermatitis is one of the biggest dangers of working with art materials and occupational contact dermatitis is often detected on the hands of the painters. Solvents are indispensable and turpentine is the most important and the traditional one used in oil-painting. Contact allergy to oil of turpentine was reported to have become rare in Europe but over the last few years, increased rates of turpentine sensitization have been reported.

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Key words: Turpentine. Contact dermatitis. Allergy. Allergic contact dermatitis. Oil painter. Hobby.

INTRODUCTION

Turpentine is an oleoresin obtained from various species of pine. It contains a volatile oil (oil of turpentine) which is responsible for its properties and is the form generally used. It is universally used as a solvent to dissolve and thin lacquers, varnishes and paints. It is also an ingredient in many liniments, cold remedies and veterinary medications¹.

Turpentine is regarded both as a local irritant and a sensitizer. Cases of allergic contact dermatitis in painters, mechanics, shoe repairers and home decorators have been reported¹.

We report a case of a non-professional painter who developed a contact allergic dermatitis due to his exposure to turpentine while painting as a hobby.

CASE REPORT

A 67-year-old man, with no prior history of skin disease and with no personal or family history of atopy, presented a 1-year history of recurrent severe eczema of the hands. He referred erythematous, itching and exudative lesions followed by scaling, affecting both hands. No involvement of other parts of the skin was reported.

He was a recently retired man who had chosen painting, and specifically oil-painting, as a hobby, and who now spends a lot of time doing his new activity. He used oil paints and oil of turpentine to dilute them and to clean brushes. He did not wear gloves for skin protection.

Clinical examination showed multiple erythematous papules and excoriations on the back of both



Figure 1.—Eczema on the dorsal aspect of the hand.

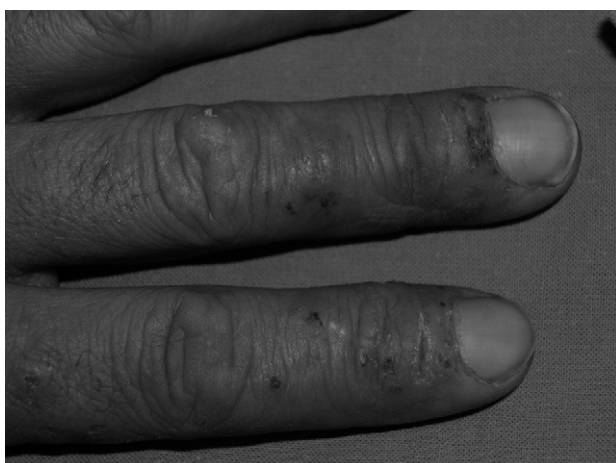


Figure 2.—Chronic eczema on the fingers.



Figure 3.—Positive reaction to oil of turpentine.

hands with mild hyperkeratosis, scaling and fissures involving the fingers. (Figs. 1 and 2). Treatment with different topical corticosteroids for several weeks had not procured recovery.

Patch test was performed with the standard series, acrylate series, synthetic resins and glues and additional metals according to the guidelines of the Spanish Contact Dermatitis Research Group (GEIDC). Reading was performed at D2 and D4. A positive reaction was found to oil of turpentine (+ + / + +). (Fig. 3).

DISCUSSION

We present a case of contact allergic dermatitis to turpentine in a recently retired man with oil-painting as a hobby.

Turpentine is an oleoresin obtained from various species of pine trees. The oil of turpentine (often simply called turpentine), which is responsible for its properties and is the form generally used, represents the volatile oily fraction derived from the distillation of turpentine. The non-volatile residue remaining is known as colophony or rosin, which is present in many adhesives and may cause dermatitis in sensitized individuals¹.

Oil of turpentine is a variable mixture of terpenes. The main components are alpha-pinene, beta-pinene, delta-3-carene, and dipentene (limonene). These are monoterpenes with a common chemical formula $\text{C}_{10}\text{H}_{16}$. The concentration of each fraction varies with the botanical species and the geographical source^{1,2}.

The principal sensitizer in turpentine was identified as delta-3-carene hydroperoxide, an oxidation product of delta-3-carene, especially in oils originating from Finland and Sweden³. However, other components such as pinene and limonene (dipentene), may also be sensitizers and cross-react with the oils in orange peels and other essential oils. Patients specifically reacting to other allergens have been described^{1,3}.

The opportunity for contact with turpentine is widespread, both in industry and elsewhere. Oil of turpentine is an ingredient in many over-the-counter preparations such as liniments, ointments, cold remedies and veterinary medications.

The most commonly used products containing turpentine include varnishes, lacquers, floor waxes, sealing wax, paint thinners, and dry-cleaning materials. It can also be present in shoe and floor polishes, printer's ink and various adhesives, including adhesive tape. Topical agents containing turpentine include Mentholatum and Vicks Vaporub¹.

Cross-sensitivity reactions may occur between turpentine and other substances such as ragweed oil, chrysanthemum, pyrethrum, benzoin, colophony¹, peppermint, tea tree oil⁴ and various balsams, such as those of pine, spruce, and Peru¹.

Turpentine is both a primary irritant and a sensitizer. It is universally used as a solvent and a cleanser for removing paints and waxes and is a common cause of hand eczema. Solvents are responsible for an estimated 6 % to 20 % of cases of occupational dermatitis.

Old, oxidized turpentine is more irritating and sensitizing than the freshly made variety. Freshly distilled turpentine is less antigenic than turpentine that has been stored and become oxidized. When turpentine is allowed to stand, especially with exposure to light, oxidation results in the formation of formic acid and aldehydes, which may be irritating to the skin. Oxidation products of turpentine may cause allergic sensitization and cross-react with the oils in orange peels and other essential oils. The eczematogenic effect of delta-3-carene depends on its hydroperoxide content¹. These principal sensitizers in turpentine are tested as turpentine peroxides 0.3 % in olive oil.

However, in a recent study, the comparison between different patch test preparations was shown and the results do not support the hypothesis that higher degrees of turpentine peroxidation go along with a higher sensitization rate. The most striking difference between the turpentine preparations is their delta-3-carene content³.

Contact allergy to oil of turpentine was reported to have become rare in Europe because of its replacement by other solvents². In Europe, turpentine was a frequent cause of occupational allergic contact dermatitis in the past in painters, mechanics, shoe repairers and home decorators². But allergy to turpentine became rather rare, mainly due to the increasing use of oils containing only small amounts of delta-3-carene (oils of turpentine from Portugal, Spain and the south of France that contain less delta-3-carene than those formerly used) and the replacement by less allergenic and cheaper substitutes derived from petroleum or limonene/dipentene, citrus oils and citrus terpenes as natural solvents^{2,3}.

However, it remains relevant in some occupations such as in the perfume industry and pottery workers where a transient re-emergence of occupational turpentine allergy was recently described in employees in the pottery industry⁵.

Over the last few years, an increase in positive patch test reactions to turpentine has been described. The reason for the increased rates of turpentine sensitization in the population tested is not clear. Although a detailed analysis is necessary; they suggest that it may be due to popular topical remedies, cosmetics or household chemicals or to the appearance of cross-reactions due to the increasing use of other related sensitizing substances, including ragweed, chrysanthemums, peppermint, bergamot oil and also tea tree oil, which is a mixture of many terpenes³.

Hobbies often require various contacts with common sensitizers; paint, glue, wood or wood preservatives are examples of these. Dermatitis is one of the biggest dangers of working with art materials and occupational contact dermatitis is often detected on the hands of painters. There are numerous compounds found in paint: Pigments, vehicles (binders), antifoam agents, antioxidants, driers, paint thinners, plasticizers, preservatives and so on. Solvents are responsible for an estimated 6 % to 20 % of cases of occupational dermatitis. All solvents can cause dermatitis by dissolving the natural protective barrier of oil on the skin¹ and of these, turpentine is the most important. Turpentine is the traditional solvent used in oil painting.

Allergic contact dermatitis of the hands in an oil painter has been reported previously^{4,6} as well as in a porcelain painter⁷ and in a violinist⁸.

In accordance with the fact that turpentine appears to be associated with a high frequency of concomitant allergies³, in all these cases the patients reacted to turpentine as well as to other substances, such as epoxy resin in varnish⁶, methylchloroisothiazolinone and methylisothiazolinone (MCI/MI) used as a preservative and biocide⁴, fragrance mix, lavender oil and anise oil⁷ and colophony^{7,8}. The positive reactions to these oils, as well as to fragrance mix and colophony, may be interpreted as a groupreaction to the terpene hydrocarbons. These are the main components of turpentine, and are widely used in the perfumery industry as starting materials for fragrances. Colophonium and turpentine oil are both components isolated from the resin of conifers by distillation. A contact allergy to MCI/MI in 9.5 % of turpentine positive compared to 2.3 % in turpentine negative-patients has been reported³. In our report there were no positive reactions to other substances.

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