Occupational and Industrial Dermatology

Edited by

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Preface

THIS BOOK is intended to serve as a primer and intermediate text in the field of occupational dermatology. It is designed for use by health professionals engaged in the recognition, management, and treatment of work-related skin diseases. It emphasizes basic science information on the mechanisms and etiologic agents of occupational disorders.

Occupational dermatology, a rapidly enlarging field, cannot be completely covered in one text. This volume supplements two current books: Etain Cronin's *Contact Dermatitis* (Churchill Livingstone, 1980) and Jean Foussereau et al.'s *Occupational Dermatology* (Munksgaard, 1982). As the field develops, there will be need for an encyclopedia of occupational dermatology.

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PART I

THE BASICS

Chapter 1

The Diagnosis of Occupational Skin Disease

Robert M. Adams

APPROXIMATELY 95% of patients with occupational skin disease have contact dermatitis from irritation or contact allergy, or both. The remainder have disease of a biologic or physicomechanical etiology or from one of a number of miscellaneous causes (Table 1-1). The diagnostic approach to patients with occupational skin disease does not differ from the diagnostic approach to patients with nonoccupational skin dermatoses, but a suspected work relationship increases the complexity and time required for thorough study. Too often patients with occupational disease are given insufficient time during the initial examination and valuable information is missed. When several months have elapsed, the circumstances surrounding the onset of the skin disease will have been forgotten and treatment will have changed the appearance of the eruption. Furthermore, if several physicians have been consulted, as well as one or more lawyers, it may be impossible to discern the nature and circumstances of the original dermatitis. Meanwhile, the patient may suffer months or even years of unnecessary disability. For these reasons, a thorough initial examination is critical.

Workers that develop a new skin disease often believe it is caused by their work solely because the condition did not exist prior to employment, especially if it is a new job. It is tempting for physicians to accept this explanation, particularly if the worker is known to be exposed to one or more hazardous chemicals. However, of 168 hours in a week, the average person works only 35 to 40 hours. Assuming that 7 to 8 hours of every 24 are spent in sleep, 75 to 80 hours a week are taken up with nonoccupational pursuits, more than twice the time spent at work. Keeping this in mind, we can then embark on careful study of the home and hobby activities, as well as a detailed analysis of the work and work environment.

TABLE 1–1.—CAUSAL FACTORS IN OCCUPATIONAL SKIN DISEASE

Contact eczematous dermatitis
Irritant, Allergic } acute and chronic
Physical and mechanical
Heat (burns, hyperhidrosis, erythema ab igne)
Cold (frostbite, immersion foot, pernio)
Vibration (Raynaud's phenomenon)
Ionizing radiation (acute and chronic radiodermatitis, squamous cell carcinoma)
Nonionizing radiation (sunburn, microwave, infrared, laser)
Friction (calluses, blisters, abrasions, occupational stigmata)
Pressure (atrophy, bullae, necrosis)
Biologic causes
Bacterial (staphylococci, erysipeloid and tularemia)
Viral (herpes, orf, and warts)
Rickettsial (typhus, Rocky Mountain spotted fever, psittacosis)
Spirochetal (nonvenereal syphilis)
Fungus (dermatophytes, yeast, deep fungi)
Arthropods (ticks, mites, fleas, mosquitoes, larvae)
Miscellaneous
Pigmentary alteration
Follicular and acneform eruptions
Neoplasms (benign and malignant)
Granulomas
Ulcerations (intentional and accidental)

A worksheet is a convenient method for studying patients with occupational skin disease. A sample worksheet is provided in the appendix to this chapter; the remainder of the text is an amplification of information expected to be obtained by use of the worksheet.

Present Illness

Job Title

While most workers know their job title, the actual work performed may not entirely conform to the job description, as many workers help others with a part of their jobs. The official job description can assist the physician in eliciting information from the worker on the work actually performed. Descriptions of over 28,000 job titles in the United States can be found in the *Dictionary of Occupational Titles,* published by the U.S. Government Printing Office.[1] Always ask about previous job titles and the dates of each employment.

Date and Location of Onset

Because many workers ignore the early symptoms of dermatitis and attempt relief with self-treatment, it is often difficult to learn the exact site

of onset, but if possible, note on which hand and finger the eruption began and whether the sides, webs, dorsal, or volar surfaces were first affected. With this information and a mental picture of the actual work technique, it is sometimes possible to ascertain immediately the cause of a perplexing dermatitis.

Effects of Weekends and Vacations

The average case of contact dermatitis improves to some extent over weekends, but not if the worker performs without protection home duties such as laundering, housecleaning, or gardening. Given appropriate treatment, and provided secondary sensitization has not occurred (medication and rubber gloves are the most common causes), the typical localized contact dermatitis clears in 10 to 14 days. If the dermatitis has become widespread, as happens in allergic sensitization with autosensitization, several weeks may be required before complete clearing occurs. The patient's activities during weekends and vacations are important, as free-time pursuits often closely relate to the job. For example, a machinist may undertake automobile repairs in the home garage on weekends. If the dermatitis consistently improves or clears during the periods away from work and recurs within a day or two after returning to the same job, the work probably plays an important, if not causative, role in the dermatitis. This information alone, even without identification of a specific cause, is sufficient to warrant workers' compensation benefits in many cases.

Description of the Dermatitis

The physician should record, in the patient's words, a description of the development of the dermatitis and the activities and treatment accompanying its course. The worker's own assessment of the cause and contributing factors are very important and should be noted precisely.

Are Other Workers Affected?

If a number of workers are similarly affected, consider the possibility that a new irritant or sensitizer has been introduced into the work process or that a breakdown in techniques or protective supports has occurred. Note the number of workers performing the same job on each shift and how many are thought to be affected.

Previous Treatment

Self-treatment frequently causes aggravation of dermatitis; even the plant's first-aid station often contains such potential sensitizers as Mycolog cream, Merthiolate, Furacin, and neomycin-containing preparations. Com-

mon commercially available remedies that can cause allergic sensitization are caine topical anesthetics and topical antihistamines.

Description of the Work

A detailed work description is the single most important aspect of the workup. Questions should cover the start of the work period and allow the worker to describe in detail the various duties performed throughout the entire shift. Although much work is repetitive, the physician must know the exact work performed, with its movements and intricacies carefully described. The simple, almost unconscious act of removing excess epoxy resin from the edge of a printed circuit board with the side of the tip of the little finger may be the exact cause of a widespread epoxy dermatitis.

In order to understand a worker's description of the job, a plant visit is often necessary. Physicians who regularly treat workers from a local industry should make an effort to visit the plant and become familiar with the various work processes found there. Most dermatologists are not occupied with early-morning hospital visits and could easily use that time to visit local plants, which often begin operation as early as 7 or 7:30 A.M. Visits by interested physicians are usually welcome by plant officials, especially if a reduction of workers' compensation cases results. A description of the technique of plant visits is found in chapter 2.

Materials Contacted

A good way to learn the chemicals found in a worker's environment is to ask the worker to prepare a list of all contactants, including their trade names and ingredients, and addresses of the manufacturers. With this information the physician can consider the possible or likely causes of the dermatitis and select allergens for patch testing. Published sources of ingredients of proprietary products can be consulted, but a telephone call to a manufacturer will often disclose the ingredients immediately. The reluctance of manufacturers in the United States to disclose ingredients has been gradually disappearing since Congress passed the Williams-Steiger Act in 1970, establishing the Occupational Health & Safety Act (OHSA).

Included in this section of the worksheet is space for notation of the method for cleaning the skin, the brand and type of soap used, the availability of protective creams, and any protective clothing worn.

History

Past Occupations

A knowledge of the patient's work history from the earliest job experience is important. Previous skin diseases and a possible work relationship

can be important. Dermatitis that occurred on a previous job may help explain a puzzling positive patch test result, for example. Past health and any previous compensation claims may have some influence on the current dermatitis, especially medication taken for unrelated medical conditions.

Allergic History

Atopy, especially atopic dermatitis, contributes to occupational skin disease by reducing resistance to irritation. Previous history of other episodes of allergic contact dermatitis acquired from jewelry, topical medications, or cosmetics has important relation to the present dermatitis. For example, the preservatives used in numerous cosmetics and topical medications may also be found in barrier creams, cutting oils, and coolants. Allergic sensitization to a specific chemical may have originated many years previously in some nonoccupational activity, and the present occupation may reawaken the sensitivity to contact with the same chemical in a different form. For example, ammoniated mercury was a frequent household remedy for minor cuts and abrasions a generation ago, and allergic sensitivity to mercury was common. Renewed contact with mercury on the job many years later may reactivate the old dermatitis. Most workers will have forgotten the earlier experience until patch testing and the physician's questioning brings the previous eruption to light.

Hobbies, Home Contactants, Second Job

Home and hobby activities may be the sole cause of a suspected occupational dermatitis, but more often they contribute to continuing activity. Shampoos, harsh cleaning agents, juices of raw vegetables contacted during food preparation, and garden plants (especially weeds) are common home contactants that can aggravate an existing dermatitis.

Physical Examination

Physical examination must include the entire skin, not only the affected parts. Look for other skin diseases, such as atopic dermatitis, psoriasis, ichthyosis, and lichen planus.

Special Tests

KOH AND CULTURE.—Every physician should have available a microscope and 20% potassium hydroxide aqueous solution for fungal studies such as KOH mounts and cultures on Sabouraud's media. These simple procedures may produce positive results that clarify an otherwise puzzling problem.

BIOPSY.—Skin biopsy with histologic examination may help differentiate skin diseases of nonoccupational origin from work-related contact dermatitis, such as psoriasis and lichen planus. Biopsy is frequently needed to establish legal proof in contested cases. The value of the biopsy is often to rule out other non-work-related processes.

PATCH TESTING.—The most important laboratory test for the study of patients with occupational contact dermatitis is the patch test. The technique is simple, but choosing test substances and interpreting results require considerable knowledge and experience. Patch testing should be performed only by dermatologists or allergists with knowledge of and experience with the procedure and its pitfalls (see chap. 6).

CLINICAL PHOTOGRAPHS.—Photographs showing the nature and extent of the skin disease can be valuable, especially in disputed cases.

Appendix

OCCUPATIONAL HISTORY AND PHYSICAL EXAMINATION WORKSHEET

I. PERSONAL DATA

Name_____ Date_____
Address_____ Age_____ Sex___
Home phone_____ SS#_____ Referred by _____
Employer (name and address)_____
Present job title_____ How long?_____ Job title at onset_____
How long?_____
Insurance carrier (name and address)_____

II. PRESENT ILLNESS

Date of onset_____ Date of Disability_____
Location at onset_____ Patient's description of dermatitis:
_____
_____
Effects of weekends: Improved_____ Unimproved_____ Worse_____
Effects of vacations: Improved_____ Unimproved_____ Worse_____
Duration of vacation_____
Other workers affected? Yes_____ No_____ How many on this job?_____
How many affected?_____
Previous treatment:
1. Plant dispensary_____
_____
2. Other physician _____
_____
3. Self-treatment _____
_____
Description of work _____
_____
_____