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SPOROTRICHOSIS

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Sporotrichosis, caused by the fungus Sporothrix schenckii Hektoen & Perkins (13), and its variety Sporothrix schenckii var. luriei Ajello & Kaplan (2), is an insidious disease of humans; one may be exposed to it when working with plants and plant-growing media. Awareness of the existence and nature of this disease along with methods of prevention and treatment may avert or alleviate a potentially traumatic illness.

Sporotrichosis usually initiates as a skin disease affecting primarily the exposed parts of the body (hands, arms, and legs) (4). It is most commonly a chronic, cutaneous and subcutaneous, lymphatic (rarely respiratory) mycosis that may remain localized in the skin for months; it may also become generalized, involving the bones, joints, lungs, and the central nervous system (8,13). Occasionally, inhalation of the causal agent causes lung infections (1).

The first case of sporotrichosis in humans was reported from the United States by Schenck in 1898 (6,13). During the first two decades of this century, the new mycosis was recognized as a common disease in France (13). The majority of published cases have been in adults, especially those with an occupational exposure to materials contaminated with the causal agent. Only a few cases have been reported in children (6). The disease occurs most commonly among manual laborers such as farmers, nurserymen, gardeners, horticulturists, and tree planters. The disease can also affect domestic and laboratory animals (13).

Infection is usually acquired by traumatic implantation of spores into the skin or subcutaneous tissue. In humans, it is most frequently associated with injury caused by the prick of a thorn, splinter, barb, stick, stone, metal particles such as steel wool, or similar object that is contaminated with the causal agent (1,8,12-14). The greatest number of cases from any one area occurred in miners who worked in gold mines in the Witwaterstrand near Johannesburg, Union of South Africa. As reported in 1947, nearly 3,000 men were infected by contact with contaminated mine timbers within a period of two years (13). However, the disease was not spread from patient to patient (13). Sporotrichosis is not contagious. In recent years, cases of sporotrichosis have been reported in Canada (1), Florida (5,14), Kansas (6), Minnesota (9,15), Mississippi (12), Vermont (7), and Wisconsin (11).

In 1986, the State of Florida's Department of Health and Rehabilitative Services issued a flyer warning nursery workers of the possibility of acquiring sporotrichosis in association with the handling of sphagnum moss (pers. comm. W. W. Smith).

SYMPTOMS. Of 81 cases of sporotrichosis reported in the United States' literature (1969-1979), 54% were cutaneous, and 46% were extracutaneous forms of the disease (8). Common symptoms associated with the various forms of sporotrichosis follow.

Cutaneous lymphatic sporotrichosis is the classic form of this disease. Following subcutaneous implantation of spores in a penetrating wound, a papule may develop at the site of injury within two to three weeks (8,13). The papule slowly enlarges and frequently ulcerates. Without treatment, secondary lesions progressively develop along the lymphatic channels draining the initial site of infection. These lesions successively form nodules, ulcerate, and drain (Figs. 1,2). Unless treatment is initiated, lesions may persist for years.

Cutaneous nonlymphatic sporotrichosis: There are some cases in which lesions remain localized and do not involve lymphatics or other systems (13). The lesion is restricted to the site of inoculation and may be nodular, ulcerative, or verrucous (8).

Extracutaneous forms of sporotrichosis include: a) Pulmonary (involving lungs) - symptoms of cough, low-grade fever, and sputum production are most common (8); b) Osteoarticular - involving the bones and joints, but may also involve the bursa (8); c) Ocular - usually associated with disseminated disease or trauma to the eye (8); d) Sporotrichosis of the central nervous system - considered to be a rare disease. Headache and confusion are common symptoms, which may have acute or chronic onset (8); e) Multifocal sporotrichosis - usually a result of dissemination from the primary focus of infection,

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presumably via the bloodstream. Any or all organs of the body may be infected. This form of the disease has rarely been reported in the literature (8).

Fig. 1. Early development of sporotrichosis following entry of the spores of Sporothrix schenckii in a wound caused by a wood splinter to the index finger of the patient's hand as indicated by arrow. Note the development of subcutaneous nodules along the lymphatic chain of the hand and forearm (B-57423).

Fig. 2. Advanced case of sporotrichosis. Ulcers developed along the lymphatic chain of the arm following rupture of the subcutaneous nodules.

IDENTIFICATION. Positive diagnosis is made by isolating the fungus from a symptomatic individual, and identifying it in the laboratory. The fungus is currently known only in its asexual form (1). There is no evidence that it is pathogenic to plants (13). Sporothrix schenckii is dimorphic. In human tissues, it is yeast-like (13). In culture at room temperature, fresh isolates of S. schenckii form a moist mycelial colony commonly with a wrinkled or folded surface (Fig. 3). The colony color of S. schenckii is at first white or creamy. It finally becomes gray, chocolate brown, or almost black in some instances (3,13). Sporothrix schenckii var. luriei produces a light tan colony that becomes white during maintenance in the laboratory (2). Sporothrix schenckii produces conidia borne singly or in clusters on lateral branches (3,8) (Fig. 4).

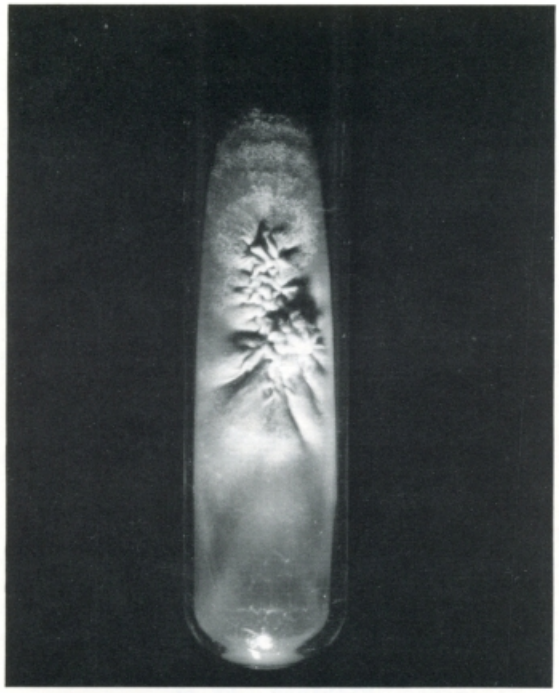

Fig. 3. Colony of Sporothrix schenckii, the fungus that causes sporotrichosis.

Fig. 4. Infectious spores of Sporothrix schenckii produced on nutrient agar. These spores, when they enter tissue through a skin wound, initiate an infection (NP73-75).

HABITAT. The fungus has been isolated from soil, humus, fertilizer, stems of beech trees and equisetum, vegetable debris, moist wood, several kinds of domestic animals, refrigerated meat, and many types of plants (4,6,7,13). Known potential vehicles of sporotrichosis include rose bushes, cacti, salt meadow hay, baled prairie hay, residual packing straw, Russian olive, hawthorn, carnations, timber splinters, other plant thorns, and most commonly, sphagnum moss (8,14). Citrus thorns may also be vehicles of S. schenckii.

In 1984, the causal agent was isolated from 2 of 12 national brands of potting soil with significant frequency (10). Although sporotrichosis is not new to the nursery business, this is the first time that S. schenckii had been isolated from commercial growing media, which means that it is now a concern in container as well as bareroot nurseries.

GEOGRAPHIC DISTRIBUTION. Sporotrichosis occurs around the world in both temperate and tropical zones. Its etiologic agent occurs in the United States, as well as Canada, Mexico, Central America, South America, France, England, the Union of South Africa, Sudan, India, Japan, and Australia (1,8,13).

PROTECTIVE MEASURES AND CONTROL.

- Workers handling sphagnum moss or those who are likely to be traumatized by objects, e.g., thorns, timber splinters, sticks, should wear heavy gloves and long-sleeved shirts to protect their hands and arms, heavy clothing to prevent trauma to the body, and thick shoes to prevent trauma to the feet.

- A thorough washing of arms and hands with soap and water after any exposure to sphagnum moss or nursery soil is recommended to reduce the chances of infection.

- If punctured by a thorn or splinter, immediate use of a disinfectant such as iodine tincture may prevent infection.

- Supplies of sphagnum moss should be stored indoors, under dry conditions. Sphagnum moss with a high moisture content and stored in a warm area would be a favorable environment for proliferation of S. schenckii, providing airborne spores that could be inhaled by workers in the area (1,8).

- In areas where dust or aerosols of sphagnum moss are created, exhaust fans with biologic filters should be installed to remove infective particles from the air (8).

- Scrub all storage and packing buildings monthly with a disinfectant.

- Regularly culture recently received and stored sphagnum moss for the presence of S. schenckii (12).

- Lumber should be treated with fungicides in industries where this pathogen is suspected.

Established methods for decontamination of large supplies of sphagnum moss infested with S. schenckii do not exist (12). Chemical decontamination with a formaldehyde solution or with methyl bromide has been suggested (12). Burning is effective.

- Report any suspicious skin infection as soon as detected.

With respect to cutaneous sporotrichosis, lesions do not respond to antibacterial antibiotics or surgical drainage but do respond to orally administered potassium iodide (12). Lesions usually heal in about two months (15). This treatment, while cheap and effective, may cause some discomfort. Some patients endure a perpetually upset stomach while taking this medication and may experience discomfort afterwards (15).

Control of extracutaneous sporotrichosis usually requires treatment with amphotericin B alone or in combination with flucytosine, surgery, or both (12).

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