Sporotrichosis due to contact with contaminated sphagnum moss

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Sporotrichosis is a chronic infection that usually results from accidental implantation of the fungus *Sporothrix schenckii* into the skin. The infection may remain localized in the skin or spread via the draining lymphatics. Rarely hematogenous dissemination to the bones, joints and other organs occurs, and occasionally inhalation of the fungus causes lung lesions.

Three cases of cutaneous sporotrichosis following contact with sphagnum moss by hobby gardeners are presented. In addition, two cases of a cutaneous eruption clinically compatible with sporotrichosis that developed in nursery employees are discussed.

Case reports

Case 1

A 31-year-old woman presented in July 1978 with a 3-week history of tender nodules affecting the left hand and arm. She was otherwise in good health and had no other medical or dermatologic problems. Before the nodules formed, she had incurred several abrasions on her left hand while preparing a hanging basket using chicken wire and sphagnum moss.

Two erythematous crusted nodules were noted on the index and little fingers of her left hand (Fig. 1), as were numerous firm nodules along the left forearm in the distribution of the lymphatic drainage from each of the primary sites. The left epitrochlear node was enlarged and tender. Skin biopsy revealed a granulomatous inflammatory reaction compatible with a deep fungal infection, and *S. schenckii* grew from a tissue specimen inoculated on Sabouraud's agar.

Treatment was with a saturated solution of potassium iodide, 20 drops taken orally three times a day initially; the thrice-daily dose was gradually increased by 1 drop to a maximum of 50 drops, then was decreased by 1 drop until there were no clinical signs of the disease. Maintenance therapy was given for a month. The total duration of potassium iodide therapy was 4 months. During the third month an acneiform eruption on the patient's chest and mild conjunctivitis developed. These problems gradually cleared after the potassium iodide therapy ended.

Case 2

A healthy 50-year-old woman presented in April 1978 with a purulent erythematous nodule on her left index finger, as well as four firm, nontender satellite nodules along her left forearm in the area of the lymphatic drainage from the primary site. A lymph node in the left axilla was enlarged but not tender.

The patient, an avid gardener, had been preparing hanging baskets with sphagnum moss and had acquired a small cut on her finger that failed to heal. *S. schenckii* grew from pus aspirated from the finger nodule and inoculated on Sabouraud's agar.

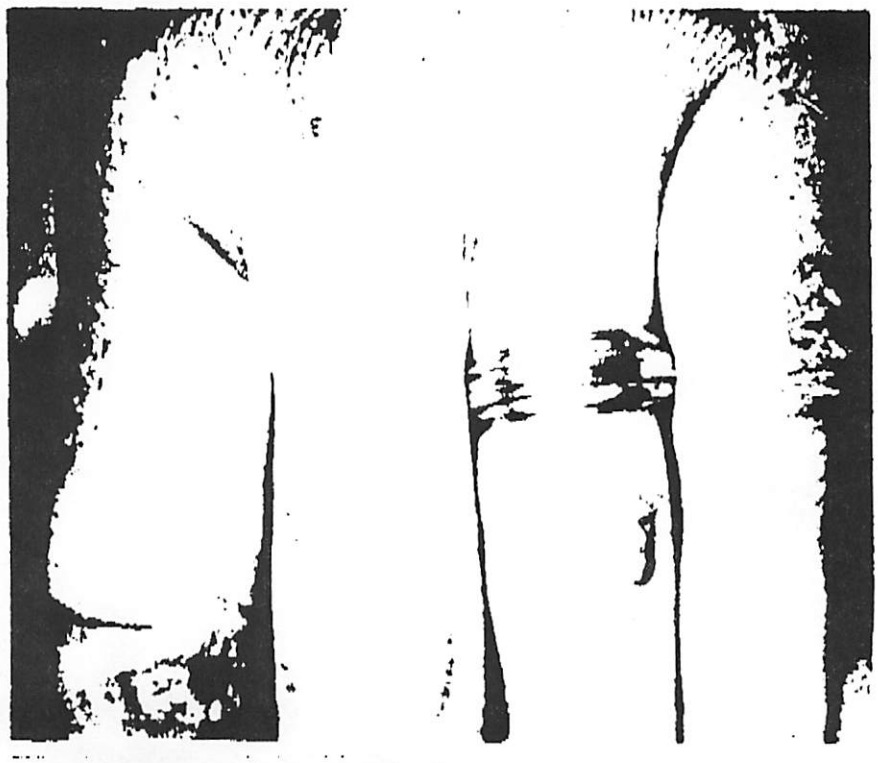
Treatment with potassium iodide eradicated the nodules.

Case 3

Three weeks after working with sphagnum moss for use in a hanging basket a healthy 50-year-old woman noted a red, tender, purulent nodule on her left ring finger. She went to the emergency department of a local hospital on five occasions and was treated with an assortment of antibiotics that all failed to alter the nodule.

When seen in July 1978 by dermatology staff she had firm nodules along her left forearm and upper arm in the area of the lymphatic drainage from the primary site, and the finger nodule was now crusted. Pus aspirated from the finger nodule and inoculated on Sabouraud's agar yielded *S. schenckii*.

The nodules cleared over a 4-month period with potassium iodide therapy. A mild acneiform eruption developed during treatment but subsided after its completion.



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Laboratory investigation

All three patients had bought 5-l sealed plastic packages of sphagnum moss from a local garden supply centre between April and May of 1978. The material was damp, and considerable condensation was visible on the inside of the plastic.

One-gram samples of the moss were shaken in 50 ml of sterile saline containing polysorbate (Tween) 80, and the mixture was allowed to settle for 1 hour. Serial dilutions of the clear fluid were inoculated on Sabouraud's agar containing 0.5% cycloheximide and 0.005% chloramphenicol, and the plates were incubated at 37°C for 5 days, then at 25°C for a further 5 days. Incubation at the higher temperature suppressed the growth of many fungal spores contaminating the moss, and in 5 days most of the colonies with *Sporothrix*-type sporulation (both mycelial and yeast) had grown sufficiently to be visible and subcultured. Continued incubation at 25°C enabled the cultures that had not grown at 37°C to develop. The concentration of spores of *S. schenckii* in the moss was found to exceed 10 000 g.

Several types of *Sporothrix* colonies were observed. Isolates of *S. schenckii* typically produced abundant thick-walled dark spores in addition to hyaline conidia, so the cultures rapidly became black. All the spores readily converted to the yeast form on semisolid brain–heart infusion agar at 37°C, and all the cultures tested produced peritonitis, orchitis and characteristic bone, skin and foot pad lesions when injected intraperitoneally into male mice. Some isolates with *Sporothrix*-type sporulation that were identified as *S. schenckii* later produced perithecia in culture, which indicated that they were members of the genus *Ceratocystis*. Other isolates remained asexual at 25°C but converted to the yeast form at 37°C; however, they did not cause disease in mice.

We confirmed that damp moss sealed in a plastic bag and stored in a warm area is a favourable environment for the growth of *S. schenckii* by adding fewer than 50 spores from one of the clinical isolates to a bag of damp but sterile moss. Within a week the fungus had permeated the moss and was sporulating vigorously.

When cutaneous sporotrichosis is clinically suspected, tissue from a punch biopsy specimen or pus aspirated from a fluctuant nodule should be inoculated on Sabouraud's agar containing 0.5% cycloheximide and 0.005% chloramphenicol. Growth of the fungus usually permits diagnosis within 10 to 14 days. The colonies are initially creamy and yeast-like but later become brown to black and acquire a characteristic folded, leathery appearance.

Although culturing is the most accurate method for confirming a clinical diagnosis of sporotrichosis and was successful in all three of our cases, other techniques — such as fluorescent antibody testing,[1] serologic study[2] and sporotrichin skin testing[3] — may at times be required.

Search for additional cases

Following presentation of our three cases at a meeting, we advertised in two national periodicals for information from physicians on cases of sporotrichosis that they had recently encountered. A total of 35 cases (including our 3) were identified. All were reported from southern Ontario, between Windsor to the west and Ottawa to the east; the largest single group was from London.

In all cases the disease had developed while the individual was gardening or working with plants and using sphagnum moss. Most of the patients (19 female and 16 male) were hobby gardeners, but a few were nursery employees or florists. In several instances parent and child or husband and wife had gardened together and were both infected.

We do not wish to imply that all these cases were due to contaminated sphagnum moss but, rather, to point out that sporotrichosis may be more common than is generally suspected. Many published articles have indicated that sporotrichosis is more frequent in males than in females because of occupational exposure, but with the current fashion for decorative planters in homes and offices and the consequent exposure of female home gardeners to infection the relative incidence may be changing. In Japan, for instance, the disease has recently been reported as occurring more commonly in females than in males, the ratio being approximately 3:2.[4]

Enquiries about "boil-like" rashes among the employees of the garden centre at which our patients had bought the contaminated sphagnum moss revealed two cases in men who were landscapers. Their primary responsibilities were planting bushes and shrubs, and they routinely used sphagnum and peat moss.

One of the employees was 53 years old. A boil-like lesion developed on the back of his right wrist in July 1979, but since he was about to leave on his summer holidays he did not consult a physician. He did not treat the boil, and over the following 2 weeks it swelled and a purulent material drained, numerous new lesions appeared on his forearm and then his upper arm. On returning from his holidays he consulted his family physician, who prescribed several courses of antibiotics, none of which altered the infection.

The second employee was a 27-year-old healthy coworker of the first employee. A boil-like lesion developed on his left forearm about July 1979. By August he had numerous nodules in a line up his left forearm and upper arm, and he consulted his family physician (not the same person that treated the first employee). Different antibiotics were prescribed on three occasions.

While at work the two men often discussed their apparently similar problem and the lack of response to treatment. They decided to try hot salt-water compresses. The temperature of the water they used was "near skin-burning levels", and they applied the compresses two to three times a day. After several months of treatment the lesions cleared and the men felt that they were cured.

When we heard that these patients had had what seemed to be sporotrichosis we contacted the family physicians and were granted permission to examine their patients. In October 1980 the two men were well and had no physical complaints. The first employee had numerous irregular hypopigmented and hyperpigmented scars from 0.5 to 1.5 cm in diameter extending from the back of his right wrist to the middle of his right upper arm. There were no enlarged epitrochlear or axillary lymph nodes. The second employee had similar irregular and somewhat hypertrophic scars on his left forearm and on the medial aspect of his left upper arm. He also had no palpable enlarged lymph nodes. Biopsies of the scars revealed dermal fibrosis; no organisms could be cultured from the tissue. Chest roentgenograms were normal.

The histories of a boil-like nodule that failed to respond to antibiotics, as well as the development of multiple nodules in the area of lymphatic drainage from the primary site, suggested that these two men had had sporotrichosis. We were unable to prove this, but the distribution of their lesions, their exposure to sphagnum moss and their response to local heat therapy were compatible with the diagnosis.[5]

Further investigation of the moss supplies of the Ottawa retailer, conducted in 1981, showed that the bulk stock of the sphagnum moss from which the small packages had been filled was contaminated with the fungus. The bulk stock had been imported into Ontario 4 years previously.

Discussion

The genus *Sporothrix* was established in 1900 to accommodate fungi that had been isolated from similar lesions in humans. *S. schenckii* is presently known only in its asexual form. It probably lives on plant debris on the surface of the soil, and in North America it has been isolated from hay, wood and sphagnum moss, among other materials. Thus, agricultural workers, gardeners and florists, who are commonly exposed to these materials, have a greater likelihood of acquiring sporotrichosis.[4,5] The disease has come to be regarded on this continent as an occupational hazard.

In response to the demands of the home gardening market, peat and sphagnum moss are now sold in small plastic packages at department stores and supermarkets. We suspected from our preliminary investigation that moss with a high moisture content that was sealed in a plastic bag and then stored in a warm area would be a favourable environment for proliferation of the fungus. This suspicion was confirmed by the introduction of fewer than 50 spores of a clinical isolate of *S. schenckii* into a bag of damp, sterile moss. Within a week the fungus had permeated the moss and was sporulating vigorously.

At present there is no clear explanation as to how, or at what stage, sphagnum moss becomes contaminated with *S. schenckii*. The fungus has not been directly isolated from a bog,[6] but this may be due to the difficulties inherent in sampling large volumes. Probably once the spores have contaminated a pile of moss awaiting distribution they will grow rapidly, and when moisture and weather conditions are favourable they will permeate the whole pile. The infrequency of contamination in Canada is perhaps due to the cold climate and long periods of snow cover.

Sphagnum moss is a useful and valuable product, and contamination with *S. schenckii* is probably rare, but the plastic bags used to package the moss may provide a suitable environment for growth of the fungus.

We thank our medical colleagues as well as Dr. Alex Bakerspigel, medical mycologist with the Victoria Hospital Corporation, London, Ont., for allowing us to study their cases.

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Métastase endobronchique 20 ans après la resection d'un hypernéphrome

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Les métastases des carcinomes rénaux peuvent se trouver dans les sites les plus inhabituels. Cet article décrit une métastase endobronchique solitaire d'un carcinome rénal, apparue 20 ans après la néphrectomie, sans signe de récurrence de la maladie au site primaire.

Histoire du cas

Un homme avec antécédents médico-chirurgicaux chargés a consulté en 1960, à l'âge de 50 ans, pour hématurie. On avait diagnostiqué un hypernéphrome, pour lequel une néphrectomie gauche avait été pratiquée. Le patient a eu plusieurs problèmes médicaux par la suite, dont le plus important a été, en 1973, un carcinome transitionnel papillaire, grade 2, de la vessie, dont on a fait l'exérèse.

En août 1979 le patient consulte au Centre hospitalier universitaire de Sherbrooke pour hémoptysies présentes depuis quelques jours. La bronchoscopie, le lavage bronchique et le brossage bronchique n'ont pas démontré de cellules néoplasiques, et la radiographie pulmonaire n'a pas montré de masse tumorale. Le patient a reçu son congé avec un diagnostic d'hémoptysies secondaires à une bronchite chronique. A noter qu'il s'agit d'un fumeur de 30 cigarettes par jour depuis 40 ans.

Le patient a reconsulté le 16 janvier 1980 pour recurrence de ses hémoptysies, présentes depuis 15 jours. Une bronchoscopie de contrôle a démontré une petite masse d'aspect tumoral, avec muqueuse ulcérée, obstruant la bronche du segment postérieur du lobe inférieur saignait avec abondance au moindre contact avec le fibroscope. Le patient a été hospitalisé pour bilan complet et évaluation.

La formule sanguine, le coagulogramme et les résultats des SMA 5 et SMA 12 du sérum étaient normaux. L'analyse d'urine et la culture subséquente ont démontré une infection urinaire, pour laquelle le patient a été traité. L'analyse des gaz artériels et des épreuves de fonction respiratoire ont démontré une maladie pulmonaire obstructive.

Le bilan métastatique était négatif; en particulier, les résultats de la cytologie des expectorations sont demeurés négatifs. Néanmoins, il y avait une image suspecte au lobe inférieur gauche dans une radiogramme pulmonaire (Fig. 1). Comme les ganglions paratrachéaux droits exérés au cours d'une médiastinoscopie ne démontraient pas de malignité, on a réséqué le

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