Sporotrichosis (Rose Gardener's Disease) and Classification of Mycosis

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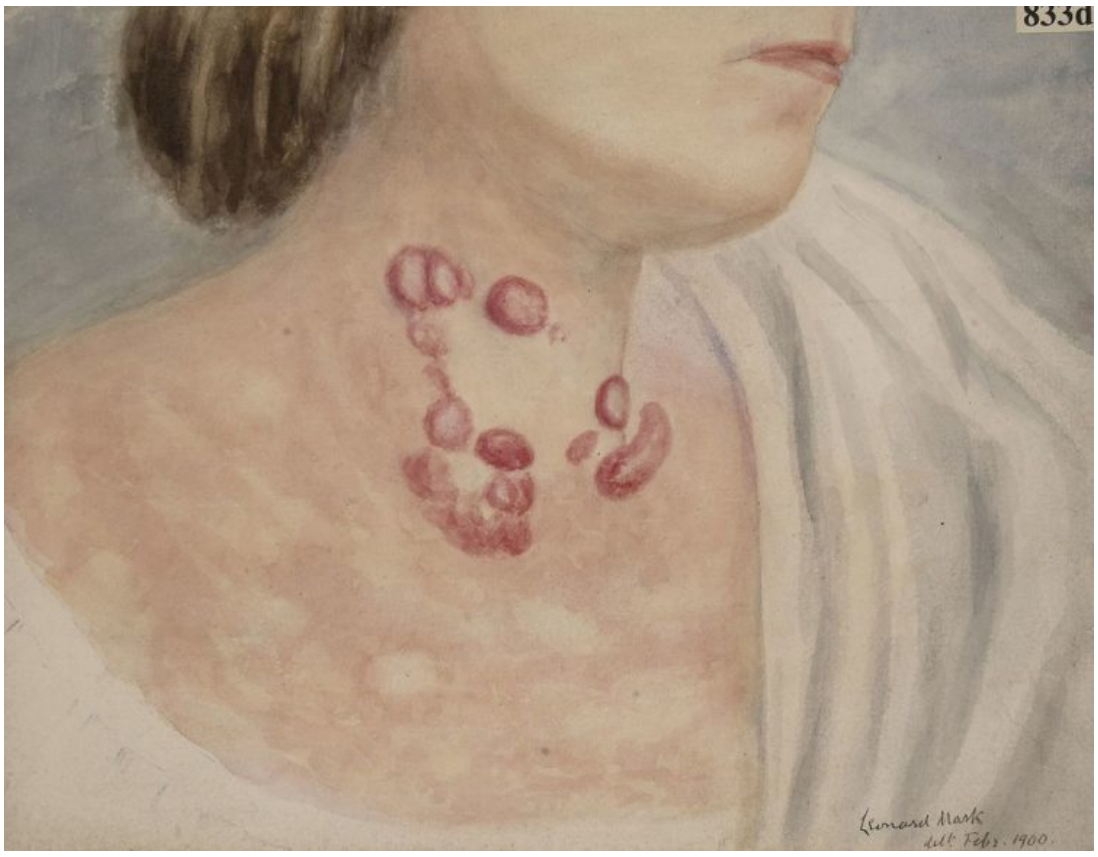
Mycosis is a fungal infection, affecting all animals, including human beings. It is a subacute or chronic infection caused by a saprophytic dimorphic fungus *Sporothrix schenckii*. In addition to the pathophysiological state of the body, the environmental factors equally contribute to the development of mycosis. The fungal infection usually begins either with the inhalation of the spores or through direct cutaneous invasion of the organism.



Risk Factors for Developing Mycosis

- Antibiotic therapy
- Steroids or chemotherapy
- Diabetes
- The immunocompromised state as in the human immunodeficiency virus (HIV).
- Extreme age groups, i.e. very young or very old

Classification of Mycosis

Based upon the **level of tissue invasion**, mycoses may be divided into the following types:

Superficial mycosis

This infection is limited to the **superficial layer of the skin and hair**, e. g., Tinea versicolor.

Cutaneous mycosis

Cutaneous mycosis not only invades **deeper into the epidermis of the skin** but also involves **the hair and nails** of the body. The organisms causing this infection are called **dermatophytes**, often limited to the **keratinized layer of skin, hair, and nails**. The host immune system may be activated causing **local inflammatory changes**. Examples include ringworm infection.

Subcutaneous mycosis

Subcutaneous mycosis occurs as a result of **piercing trauma to the skin,** thus causing the organism to invade the **skin, subcutaneous fats, fascia, and muscles**. Such infections require debridement and treatment with antifungal drugs.

Systemic mycosis

Systemic mycosis can be either due to **primary pathogens** or **opportunistic organisms** that are already residing inside the body. In the former case, they are usually inhaled and spread to the local tissues and lymphatic stream causing a systemic infection. Opportunistic infections mostly occur in **immunocompromised individuals**. Examples of the latter include candidiasis, aspergillosis, and cryptococcosis.

Sporotrichosis

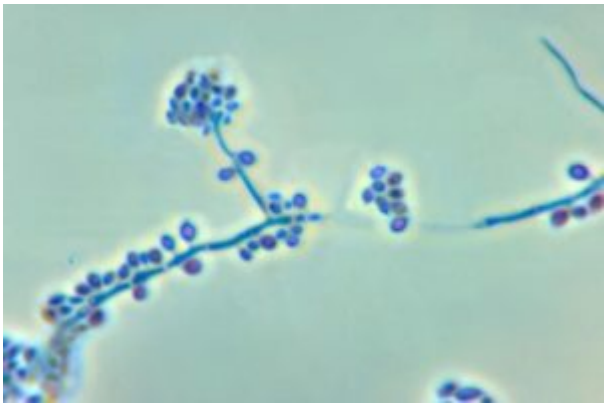


Image: “This photomicrograph reveals the conidiophores and conidia of the fungus Sporothrix schenckii. Sporotrichosis, caused by the etiologic pathogen Sporothrix schenckii, is a skin infection involving the subcutaneous layer. It manifests itself in the formation of large ulcerations; however, the disease can become systemically disseminated,” by http://phil.cdc.gov/phil_images/20030721/16/PHIL_4208_lores.jpg. License: Public Domain

Sporotrichosis, also known as **Rose Gardener's Disease**, is a fungal infection caused by the species ***Sporothrix schenckii*** shown in the figure. The most common form of sporotrichosis is cutaneous infection. Pulmonary and disseminated infections, although rare, have also been reported.

Epidemiology

Sporotrichosis occurs **worldwide**. It is **endemic in China**. Epidemics have been reported in South Africa, Australia, and Brazil. In Peru, the incidence is 1 case in 1000 people. The prognosis of the disease is very good.

Morbidity is associated with pulmonary sporotrichosis, specifically in patients with chronic obstructive pulmonary disease (COPD) or osteomyelitis developed as a result of dissemination. The mortality rate is significant in immunocompromised patients.

Sporotrichosis is more common in women than men and most often seen in adults.

Pathophysiology

The common mode of transmission of sporotrichosis is through **skin inoculation**. The dimorphic organism is found in the **soil** and enters the skin via cuts, wounds, animal bites or scratches.

The **initial reddish, necrotic papule of cutaneous sporotrichosis** appears after 1–10 weeks of skin injury. A **granuloma** is formed by the neutrophils, histiocytes, and giant cells, along with local necrotic tissue. This suppurative area is then surrounded by the lymphocytes and the plasma cells.

The fungal infection spreads via the **lymphatic stream**, **direct invasion of local tissues,** and rarely through the **bloodstream**. Hematogenous dissemination, if it occurs, causes **severe visceral infections,** including meningitis. The common extracutaneous sites of infection are the bones, joints, tendons, and bursae.

A rare form of sporotrichosis occurs after inhalation of the organism, which causes **pneumonia**, specifically in patients with COPD or alcoholism. Such infections are clinically and radiographically indistinguishable from tuberculosis or histoplasmosis. It may affect the sinuses, the kidney, the subglottic region, and the retina.

Clinical presentation

The clinical presentation depends upon the immune status of the host and site of the infection. Patients usually present with a **primary lesion in the distal extremities**. A small red, painless nodule may appear in 1–12 weeks of contact with the fungus usually in the arm, the finger, and the hand. Initially, it is a small nodule that enlarges and becomes pustular, and later ulcerates. it is very slow to heal. The lesion is mildly painful with no signs of systemic illness such as fever.

Later on, **new lesions** begin to appear **along the line of the lymphatic tracts** of the body. The fixed cutaneous lesions of sporotrichosis should be considered if they fail to heal spontaneously or with antibiotics. **Hypersensitivity reactions** such as 'erythema nodosum' or 'erythema multiforme' are also associated with the disease.

The clinical features of **pulmonary sporotrichosis** are usually **nonspecific** and only give clues towards the underlying respiratory pathology. Symptoms include cough, shortness of breath, chest pain, and fever. Disseminated infection is common in

immunocompromised individuals. In such cases, the signs and symptoms depend upon the organ involved.

Disseminated sporotrichosis exhibits symptoms depending on the body part involved, such as joint pain caused by the infection in the joints, difficulty in thinking, and headache and seizures caused by the infection in the central nervous system.

Diagnosis

Sporotrichosis needs to be differentiated from other bacterial and fungal infections of the lungs and joints. The differential diagnosis includes:

Image: "This patient's arm shows the effects of the fungal disease sporotrichosis, caused by the fungus Sporothrix schenckii."
Content Providers(s): CDC/Dr. Lucille K. Georg – http://phil.cdc.gov/phil_images/20030610/25/PHIL_3940_lores.jpg.
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- Bacterial pneumonia
- Blastomycosis
- Histoplasmosis
- Leprosy
- Sarcoidosis
- Tuberculosis
- Tularemia
- Syphilis

The diagnosis of sporotrichosis can be done by **culturing the organisms** from specimens such as pus, skin biopsies, cerebrospinal fluid (CSF), and synovial fluid. Periodic acid-Schiff, Gomori methenamine-silver or immunohistochemical staining methods are often used to visualize the organisms.

The **ratio of CSF to serum antibody against sporotrichosis** suggests meningeal involvement. Similarly, **X-ray** and computerized tomography (**CT) scan of the chest,** point towards respiratory pathology; however, they do not provide a definitive diagnosis.

Treatment

1. The medical approach includes **antifungal treatment** for all forms of sporotrichosis.
    - **Itraconazole** oral is most commonly used for a period of 3–6 months.
    - **Supersaturated potassium iodide** (SSKI) is also effective against cutaneous

sporotrichosis; however, it should be avoided in pregnant women.
    - In severe cases, **intravenous amphotericin B** is recommended for disseminated sporotrichosis, **followed by itraconazole therapy** for 1 year.
2. **Topical heat application** may also be beneficial as the organism grows better at 35°C. Patients can perform their routine activity as feasible.
3. **Surgical care** involves appropriate drainage of affected joints in case of osteoarticular sporotrichosis. Debridement may be done if required. In case of pulmonary sporotrichosis, surgical removal of the affected lung or specific part may be done.

Prevention and follow-up

There is no vaccine for the prevention of sporotrichosis. Sporotrichosis can be prevented with the **use of gloves and long sleeves** during outdoor activities such as gardening. Ideally, animals should also be handled while wearing gloves to avoid **zoonotic transmission**. Animals that have skin lesions can easily transmit the disease to humans. Last but not least, **patient education** is required regarding the mode of transmission and the adverse effects of antifungal therapy.

References

Sporotrichosis via cdc.gov

Sporotrichosis via medscape.com

Notes