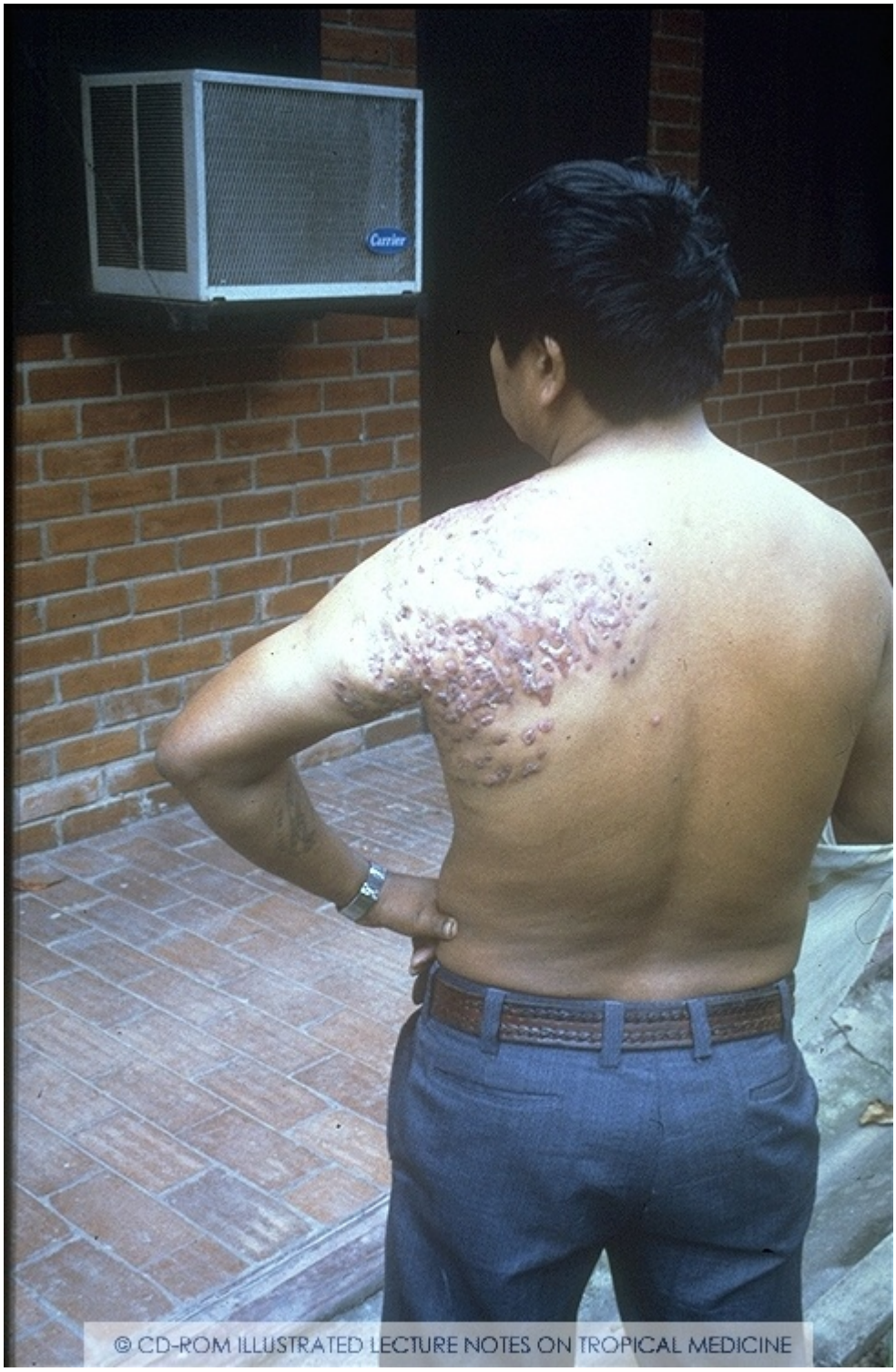
Mycetomas are chronic, inflammatory swellings with numerous sinuses, caused by moulds or bacteria. The causative agent can be seen in the bloody or non-bloody pus and sometimes with the naked eye in the form of granules. In 75% of cases, a mycetoma is localised on the foot (Madura foot). In addition to involvement of soft tissue; bone tissue is severely affected with osteolysis on the one hand and hyperostosis on the other.

Madura foot patient in King Saud Medical Complex. Riyadh. Saudia arabia
(Image source: Haitham Alfalah, Halfalah)



Mycetoma of shoulder and back

Pathogens

Mycetomas are caused by 2 totally different groups of organisms: the first are moulds and the second are filamentous bacteria in the order Actinomycetales. In the first case they are referred to as eumycetomas (mainly Africa), in the second as actinomycetomas (mainly Latin-America). Also in India, mycetoma is prevalent. The difference is very important for therapy. All causative agents of fungal mycetoma are exosaprophytes that have penetrated deep into the tissue with a splinter of wood or a thorn. The primary reservoir of the causative agents is believed to be the soil. The limited geographical distribution of most pathogens and their natural history explain why mycetomas occur practically exclusively in the tropics. Eumycetoma can be caused by more than 42 different fungal species.

Diagnosis

The differential diagnosis between fungal and actinomycotic mycetomas is based on the examination of the granules and/or culture. The compact microcolonies of the causative agents differ from one another in terms of colour, shape, dimensions and composition. Black granules are always of fungal origin (e.g. *Madurella mycetomatis*); small red granules are specific for the actinomycotic *Streptomyces pelletieri*; whitish-yellow granules can be fungal or actinomycotic in nature.

In the direct examination of a crushed granule in KOH, the distinction between fungal and actinomycotic granules can be made on the basis of the presence or absence of true hyphal fragments.

Most information is obtained from the histological examination of a deep biopsy taken from around the path of a sinus. Vesicular or filamentous elements are seen in fungal granules (Gomori-Grocott stain). Only *Madurella mycetomatis* the most common causative agent of eumycetoma, can be detected histologically by the presence of a brown cement. With the other moulds identification should be made by culture.

New DNA-isolation techniques on fungal cultures (takes 6 weeks) or directly on the grains (immediate result) are under development. Serological tests exist but don’t detect all different species and are not used in routine diagnosis.

Treatment

Until recently only surgical removal of the whole affected area was successful in treating eumycetoma.

Itraconazole for 12 months (or longer) in combination with removal of the mass, is the current the treatment of fungal mycetomas, but only results in 37% cure rate. The newer azole derivates posaconazole, voriconazole, isavuconazole and ravuconazole have excellent in-vitro activity. Their real life efficacy is under review and isolated case studies have shown resolution of symptoms with these agents. For actinomycetoma, the first choice treatment is combination treatment of 2 drugs, such as streptomycin or amikacin IV with dapsone or cotrimoxazole for a long duration (depending mainly of the causative pathogen). New data suggest that co-amoxiclav (Augmentin™) acid can be used instead of aminoglycosides to reduce ototoxicity and kidney toxicity.