Fish-tank granuloma
The first reported case in South Africa

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Summary
The first case of infection with the non-tuberculous mycobacterium, Mycobacterium marinum, in South Africa is reported. Of special interest was the linear nodular (sporotrichoid) appearance.

Infection of the skin with Mycobacterium marinum was first described by Linell and Norden in 1954 when they reported 80 cases of this infection in swimming-pool bathers. In 1962 Swift and Cohen reported a patient who had acquired this infection from a tropical fish tank.

A patient with Myco. marinum infection, which has not previously been described in South Africa, is reported. The clinical appearance of the row of nodules on the forearm mimicked sporotrichosis. Other infectious agents may also produce a linear arrangement of nodules and this pitfall in diagnosis is emphasised.

Case report
A 14-year-old deaf girl presented to the dermatology clinic at Groote Schuur Hospital in November 1982 with lesions on her left hand and forearm. Initially a plaque appeared on the dorsal surface of the proximal phalanx of the left index finger. Two further nodular lesions developed proximally on the dorsal aspect of the wrist and overlying the extensor muscles of the forearm just below the elbow (Fig. 1). Treatment elsewhere with povidone iodine, zinc and clioquinol and various antibiotics had failed to produce any improvement. There was no history of previous skin disease.

Sporotrichosis was considered the most likely clinical diagnosis and tissue was submitted for histological examination and fungal culture. Histological examination of the skin biopsy specimen revealed a dermal granulomatous lesion with epithelioid giant cells, focal collections of neutrophils and an extensive infiltrate of lymphocytes and plasma cells. No fungi or acid-fast bacilli were demonstrated. The histological appearance was consistent with sporotrichosis but it was not possible to exclude tuberculosis or other deep fungal infections.

Therapy with a saturated solution of potassium iodide was initiated, 5 drops 3 times daily at first, increasing to a maximum of 60 drops 3 times daily over a period of 2 months. When no improvement had occurred after 3 months of this therapy the patient was admitted to hospital for a review of the diagnosis and to exclude non-compliance with therapy.

At this time specific questioning of the sister in charge of the school for the deaf revealed that both the school and the child's father kept tropical-fish tanks. Further skin biopsies were performed and specimens were submitted for fungal culture, Myco. tuberculosis and atypical mycobacteria. On this occasion, the skin biopsy demonstrated an intense dermal inflammatory reaction with large numbers of plasma cells, abscesses of polymorphs surrounded by histiocytic cells and small epithelioid-cell granulomas (Fig. 2). The overlying epidermis displayed slight pseudo-epitheliomatous hyperplasia, but fungal elements and acid-fast bacilli were not demonstrated.

While awaiting the result of the culture, inpatient treatment with potassium iodide 50 drops 3 times daily failed to produce any clinical improvement. Bacilli grown on culture had bacteriological features most consistent with the organism Myco. marinum. A Mantoux skin test produced a positive reaction at 72 hours. Treatment with tetracycline 250 mg 4 times daily was started and the patient was discharged from hospital. Six weeks later there was notable improvement of the lesions and at follow up 6 months...
later the skin lesions had cleared completely and have remained clear for 2 years.

Discussion

*Mycobacterium marinum* is well documented as a cutaneous pathogen,\(^3^\,^4\) but has not been reported previously in South Africa. Patients present either with a solitary abscess or sporotrichoid nodules, which are usually acquired from aquariums or other water sources.\(^1^\)\(^-^\)\(^3\)

*Mycobacterium marinum* is classified as a Runyon group I photochromogen and grouped under the non-tuberculous (synonym: atypical, environmental) mycobacteria. These differ from *Mycobacterium tuberculosis* by growing best at temperatures of 30 - 33°C and poorly or not at all at 37°C. Injection of the organism produces disease in the footpads and tails of mice. As with most of the environmental or atypical mycobacteria the route of infection is exogenous.\(^1^\)\(^-^\)\(^3\) Patients with open wounds or abrasions are particularly prone to this infection if in contact with contaminated water in swimming-pools, fish-tanks, lakes, rivers, the sea or diseased fish.\(^1^\)\(^-^\)\(^3\)

Clinically, the patient presents with nodules, papules or ulcers at sites on the body which have been subjected to trauma — fingers, elbows, knees. The lesions may be solitary or multiple or may assume a linear or sporotrichoid appearance because of lymphatic spread. Disseminated infections in immunocompromised patients have been reported,\(^1^\)\(^-^\)\(^3\) as well as synovial and joint involvement.\(^1^\)\(^-^\)\(^3\) About 80% of patients have a positive tuberculin reaction because of cross reactivity.\(^1^\)\(^-^\)\(^3\)

The histological pattern varies greatly and does not correlate specifically with either the clinical appearance or any particular species of mycobacteria. It may vary even in the same patient on different occasions. Usually the early lesions are nonspecific and at this stage acid-fast bacilli may be seen and later granuloma formation occurs, at which stage acid-fast bacilli are usually absent.

Our experience emphasises the need to consider all the following possible causes (in addition to sporotrichosis) in patients with sporotrichoid lesions: typical and atypical mycobacteria, nocardiosis, histoplasmosis, coccidio-idomycosis, North American blastomycosis, and syphilis.\(^1^\)\(^-^\)\(^3\)

The organism is relatively insensitive to treatment with isoniazid, streptomycin and \(\beta\)-aminosalicylic acid but it is partially sensitive to rifampicin, ethambutol and ethionamide.\(^1^\)\(^\text{16}\) *Mycobacterium marinum* has been found to be sensitive to tetracycline, minocycline and co-trimoxazole.\(^1^\)\(^\text{17}\) Treatment of our patient with tetracycline 1 g daily for 7 months cleared the lesions. Small local lesions may be treated by surgical excision, curettage and electrodesication or cryosurgery.

REFERENCES