CASE REPORT

MYCOBACTERIUM MARINUM INFECTION CAUSING SEPTIC ARTHRITIS AND OSTEOMYELITIS

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SUMMARY

A 48-yr-old female on immunosuppressive therapy for fibrosing alveolitis and polymyositis developed a septic arthritis of the left middle finger proximal interphalangeal joint, tenosynovitis of the left palm and osteomyelitis of the right hindfoot due to infection with Mycobacterium marinum. Such widespread and severe bone and joint involvement has not been described previously with this organism.

Key words: Mycobacterium marinum, Septic arthritis, Osteomyelitis, Immunosuppression.

Mycobacterium marinum is an atypical mycobacterium usually associated with cutaneous lesions [1]. Deeper infection can cause tenosynovitis [2] and septic arthritis [3], typically a monoarthritis of the upper limb in otherwise healthy individuals [4]. Osteomyelitis has been reported only rarely [5–9]. We describe a patient with fibrosing alveolitis and polymyositis treated with prednisolone and cyclophosphamide who developed widespread destructive bone and joint infection.

CASE REPORT

In March 1994, a 48-yr-old woman presented with erythema and full-thickness ulceration over the left middle finger proximal interphalangeal joint (PIPJ) and a red nodule on the flexor aspect of the right forearm. Biopsy of the nodule showed a palliaded granuloma consistent with a rheumatoid nodule. She was known to have the Jo-1 syndrome with mild polymyositis, biopsy-proven severe fibrosing alveolitis and the presence of the Jo-1 antibody. Immunosuppressive treatment with oral cyclophosphamide (150 mg/day) and prednisolone had been commenced in September 1993. Following a deterioration in lung function, the dose of prednisolone was increased to 60 mg/day in December 1994. One month later, she presented with a 2 week history of pain and swelling about the right ankle and midfoot, and a swelling in the left palm.

On examination in January 1995, she was cushingoid. There was purple macular discolouration over the metacarpophalangeal joints (MCPJ) of both hands. The PIPJ of the left middle finger was swollen, red and tender (Fig. 1). The left palm was swollen. There was a nodular erythematous rash over the flexor aspect of the right forearm near the elbow. The right ankle and midfoot were swollen and painful to move.

Investigations revealed a white cell count of 12.6 x 10⁹/l compared with a previous count of 9.3 x 10⁹/l) with 11.4 x 10⁹/l neutrophils, 0.5 x 10⁹/l lymphocytes and an erythrocyte sedimentation rate of 50 mm in the first hour. Radiographs of the left hand revealed joint space narrowing at the third PIPJ. X-ray of the right foot showed narrowing of the joint space between the navicular and medial cuneiform bones.

Green turbid fluid was aspirated from the right midfoot and bloodstained fluid from the PIPJ of the left middle finger. Culture of the fluid was sterile. The right ankle was injected with intra-articular steroids with temporary relief. Further aspiration gave frank pus containing acid-fast bacilli (AFB), eventually identified as Mycobacterium marinum. The tendon sheaths of the left palm were incised and drained surgically. Mycobacterium marinum was again isolated.

The patient kept tropical fish and cleaned the tank twice a year. Standard anti-tuberculous chemotherapy (rifampicin, isoniazid and pyrazinamide) caused intolerable nausea. Doxycycline, 100 mg b.d., was prescribed instead.

Radiographs of the left hand 6 weeks later showed an erosion of the PIPJ of the middle finger. Computed tomography of the right foot showed joint space narrowing and erosions involving the navicular, cuboid and all three cuneiform bones consistent with septic arthritis and osteomyelitis of the entire midfoot (Fig. 2).

By June 1995, the skin lesions over the left finger and left palm had healed. However, an ulcer overlying the lateral...
malleolus had developed and was discharging pus. Culture of the pus gave no growth, but computed tomography showed progression of the osteomyelitis. The wound was debrided twice. Bone biopsy showed multinucleated giant cells within the bone marrow, but mycobacteria were not seen or grown. Rifampicin was reintroduced, but again had to be stopped because of nausea.

In September 1995, 5 months after discharge, the ulcer overlying the right malleolus was smaller. Ankle movements were full, but the subtalar and midtarsal joints were stiff.

**DISCUSSION**

Our patient has *M. marinum* infection of a hand and foot, involving the skin, tendon sheaths, joints and bone. Such extensive infection of bone and joint has not been described before.

Human *M. marinum* infection is not rare. It is mostly acquired from swimming pools. A chronic granulomatous skin lesion presents either as single or multiple nodules, usually on the hand or foot. Spontaneous resolution can take months or years [1, 4].

Tenosynovitis may occur in up to half of the cases [2], but arthritis is rare. In a review of the literature by Harth *et al.* [3], there are fewer than 40 established cases. There is mostly a monoarthritis of the wrist or hand [4], and only two cases of knee [10] and one of ankle [11] involvement have been reported. Arthritis occurred mainly in healthy men [3], but there are two case reports in association with underlying systemic disease [12, 13].

Osteomyelitis has been reported in five previous cases [5–9], but always involving the fingers. Failure of chemotherapy led to amputation of a digit in three cases [5–7] and excision of bone in another [9]. Disseminated cutaneous disease has been described in patients on immunosuppressive treatment [14]. Enzenauer *et al.* [13] described infection of a
wrist joint and disseminated cutaneous infection in a patient with systemic lupus erythematosus. Disseminated cutaneous infection in association with osteomyelitis has also been reported [5].

In our case, the source of infection was probably the tropical fish tank which the patient cleaned out twice a year. The first sign of infection was a deep, full-thickness ulcer on a knuckle; this was thought, at the time, to be due to vasculitis or pyoderma. The later distribution of joint involvement suggests haematogenous spread, presumably permitted by local extension from the joints. The delay in diagnosis was similar to that in previous reports of osteomyelitis (up to 10 months) [6, 9]. The use of steroid injection prior to diagnosis is also typical [6, 8, 9].

Doxycycline has been used alone to treat \textit{M. marinum} infection [4, 5], but treatment failures have been documented [4, 15, 16]. Prolonged treatment is usually required [2], but ablative surgery may be necessary for persistent disease [17]. Some authors argue that severe infection should be treated with rifampicin and ethambutol [15, 18]. In \textit{in vitro} testing suggested that the organism should be sensitive to doxycycline.

A popular magazine helped us to the diagnosis (Fig. 3). ‘Fish fingers’ may remind us of the cutaneous nodules and tenosynovitis caused by \textit{M. marinum} infection. Any patient with arthritis or other infective process of the hand, particularly if immunocompromised, should be asked if they keep tropical fish. Our case highlights that in the immunocompromised, a delay in diagnosis can lead to a destructive arthritis and osteomyelitis resistant to chemotherapy.

\textbf{REFERENCES}