

Grand rounds in rheumatology

Recurrent focal myositis of the peroneal muscles

K. Kisielinski, O. Miltner, B. Sellhaus¹, S. Krüger², H. Goost and C. H. Siebert

Department of Orthopaedic Surgery, ¹Department of Neuropathology and

²Medical Clinic I, University Hospital Aachen, Aachen, Germany

Abstract

Recurrent focal myositis is a rare entity and can be difficult to diagnose and treat. A long-term follow-up and diagnostic evaluation was carried out in a patient who presented with ankle stiffness secondary to a painful mass within the calf. This process was diagnosed as focal myositis of the peroneal muscles, which recurred over a period of 7 yr. A review of the literature regarding focal myositis, treatment options and a successful conservative therapy regimen, as an alternative to a surgical protocol, are presented. After making the diagnosis with the help of a muscle biopsy, long-term therapy should be considered. Conservative treatment of focal myositis with anti-inflammatory drugs and physical therapy can be successful but recurrence may occur if the medical treatment is interrupted.

KEY WORDS: Focal myositis, Muscle disease, Review, Therapy.

Focal myositis is a rare, benign disease of skeletal muscles, which is characterized by the histopathological features of interstitial myositis and tumour-like enlargement within a single muscle [1]. The focal enlargement is frequently localized in the lower limb [1–21]. Clinically, it can be confused with a number of diseases and the diagnosis of focal myositis is secured by biopsy of the muscle mass [1]. Differential diagnoses that have to be considered are thrombophlebitis, soft-tissue tumours, infections, eosinophilic fasciitis, myositis ossificans, localized nodular myositis, amyloidosis, proliferative myositis, neurogenic hypertrophy and pseudohypertrophy [2–6]. Focal myositis is also associated with difficulties regarding treatment [4, 5, 16, 18]. Cases have been reported in the literature in which resolution was obtained after surgery [1–21]. The disease usually presents as a localized process without affecting the joints, with a maximum duration of no more than 4 yr and without recurrence [1–21].

A 7 yr follow-up of our patient and an extensive diagnostic work-up are presented. The evaluation included ultrasound, venography, X-radiography, MRI of the liver and the involved right calf, three-phase bone scanning and electromyography. Extensive laboratory investigations and lymph node and muscle biopsies were performed. A conservative anti-inflammatory treatment was evaluated clinically, as an alternative to surgical management.

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Correspondence to: O. Miltner, Department of Orthopaedic Surgery, University Hospital Aachen, Pauwelsstrasse 30, D-52057 Aachen, Germany.

Case report

A 36-yr-old lorry driver presented with a history of recurrent periods of right calf swelling with cramping and painful stiffness of the ankle. No underlying diseases were diagnosed. The first symptoms occurred in 1993, when the patient presented with an unclear swelling of the right lower leg and inguinal lymphadenitis. He had no specific symptoms or history of trauma. There were no laboratory findings indicative of an infection: antibodies against neurotropic and hepatotropic viruses and bacterial antibodies against *Borrelia*, *Campylobacter*, *Chlamydia*, *Salmonella* and *Yersinia* were negative. There were no signs of rheumatic or rheumatoid disease; circulating immune complexes and cryoglobulins were within normal limits and HLA-B27, ANA, ENA (extractable nuclear antigens), ANCA, AMA (antimitochondrial antibodies) and DNA autoantibodies were not found.

The leg showed an increased venous filling, but the clinical, laboratory and venographic examinations excluded thrombosis. The native radiological and ultrasound examination failed to reveal a tumour. The biopsy specimen of a swollen inguinal lymph node showed chronic lymphadenitis without signs of malignant disease. Under non-steroidal anti-inflammatory treatment the symptoms improved.

Six years later, the patient presented in our orthopaedic outpatient department with renewed progressive pain in his right calf. Once again, deep venous thrombosis and infection were excluded. C-reactive

protein (CRP) and the erythrocyte sedimentation rate (ESR) were within normal limits. Immunoelectrophoresis and levels of antibodies against various bacteria and viruses were not suspicious. Creatine kinase was normal. MRI revealed myositis-specific signs within the peroneal muscle group. An open muscle biopsy was performed and revealed focally accumulated interstitial inflammation with a predominance of lymphocytes and isolated plasma cells (Fig. 1). Degeneration and regeneration of solitary muscle fibres were seen. Infiltration of lymphocytes in vital, non-necrotic muscle fibres, as seen typically in polymyositis, was not documented. The muscle was enlarged by thickening of the endomysial connective tissue with corresponding proliferation of fibroblasts. Following review of the accumulated data, the diagnosis of interstitial myositis and vasculitis with extensive fibrosis was reached. The changes were found to be characteristic of focal myositis (Fig. 1). No evidence of generalized interstitial vascular disease or specific histopathological findings was found, upholding the diagnosis of focal myositis. Non-steroidal medication was prescribed once more, with success.

However, 1 yr later the patient presented again in our department with similar symptoms. At this time the medication was stopped. A diffuse painful swelling of

the lateral aspect of the right calf with prominent superficial veins and a swelling and reduced range of motion of the right ankle were found (Tables 1 and 2). Once again, no elevation of CRP, ESR, creatine kinase or leucocytes was documented. D-dimers and venography showed no signs of deep venous thrombosis. Electrophoresis was normal. Immunological screening showed no antibodies against viral and bacterial antigens. The immune phenotypic characteristics of the lymphocytes were normal. An extensive autoantibody search, including immunofluorescent test, U1-RNP, Pm-Scl, Ku, Jo-1, PL-7, Mi-2, ANA, ENA, ANCA, AMA and DNA autoantibodies, did not reveal any pathology. No findings specific for autoimmune diseases were obtained. Tests for tumour markers, circulating immune complexes and cryoglobulins were negative. Standard X-rays showed no bone involvement. MRI revealed the known focal myositis of the peroneal muscles (Fig. 2), without fluid accumulation within the right ankle (Fig. 3). A swelling of periarticular soft

TABLE 1. Comparative measurements (cm)

Circumference	Right (affected side)	Left
Greatest calf	40	38
Least calf	25	23
Ankle	28.5	26.5
Instep-heel	37	35
Mid-foot	26.5	26.5

TABLE 2. Range of motion

Ankle motion	Right	Left
Flexion	20°	45°
Extension	0°	30°
Pronation	5°	30°
Supination	5°	60°

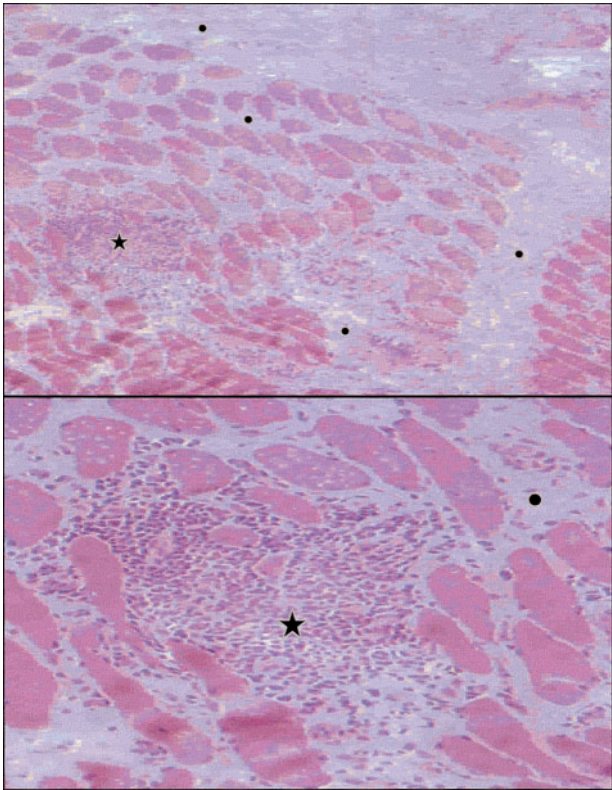


FIG. 1. Standard haematoxylin-eosin staining of muscle biopsy, revealing focal interstitial muscle inflammation (star) associated with extensive proliferation of endomysial connective tissue (circle). The lower panel shows the enlargement of the panel above.

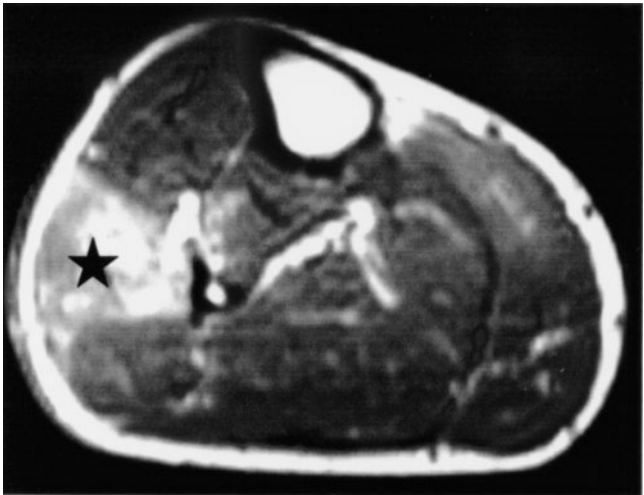


FIG. 2. T₁-weighted axial gadolinium-enhanced MRI of the right calf, showing focal myositis (star) of peroneal muscles (increased signal intensity).

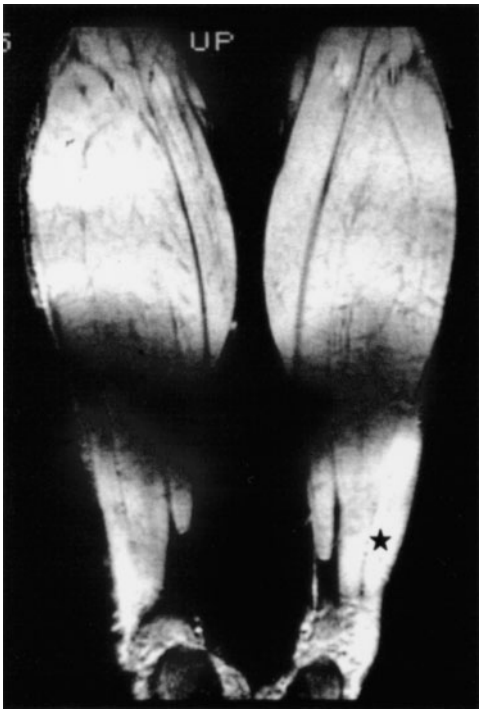


FIG. 3. T₁-weighted coronal gadolinium-enhanced MRI with increased signal intensity of focal myositis within right peroneal muscle group (star) and secondary periarticular oedema of the right ankle.

TABLE 3. Pathological laboratory analysis

Laboratory findings	Patient	Normal values
Eosinophilic granulocytes	12%	< 8%
Smooth muscle antibody titre	1:40	< 1:20
Skeletal muscle antibody titre	1:80	< 1:10

tissue was present. Scintigraphy showed marked hyperaemia within the peroneal group of the affected right calf (Fig. 4).

The neurological status of the lower leg and electromyography of affected muscles were normal. Radiological evaluation of the thorax and abdomen were without relevant pathology. The MRI sequences revealed no signs of generalized autoimmune or vascular disease. The extensive diagnostic effort helped ensure the diagnosis of focal myositis, although the levels of antibodies against smooth muscle and skeletal muscle were found to be slightly above normal limits (Table 3).

A unique observation was the restricted range of motion of an adjacent joint secondary to such a focal myositis. After non-steroidal medication with indometacin 50 mg (dosage 1-1-1) the symptoms resolved within 2 months, but physical therapy was necessary to regain normal function of the ankle. Seven months after discharge, the patient was symptom-free with no evidence of focal myositis. We advised the patient to continue his medication over the long term to prevent further recurrences.

Discussion

The patient described here presented with clinical, laboratory, electromyographic and MRI features of focal myositis as described by Smith *et al.* [5]. This case differs from those described in the literature because the focal myositis recurred within a period of 7 yr and the patient failed to develop involvement of the contralateral muscles during recurrence [10, 18]. Another new aspect of the focal myositis presented here is the ankle stiffness secondary to the involvement of the periarticular soft tissues, which has not been described previously [1–21].

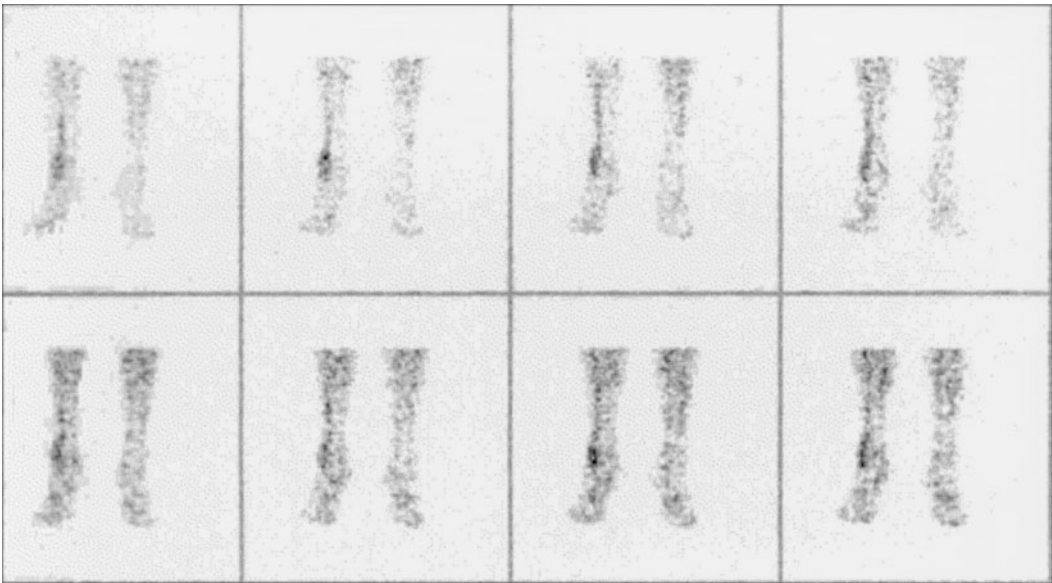


FIG. 4. Early phase of ^{99m}Tc-HDP multiphase scintigraphy, depicting hyperaemia of affected muscles secondary to the focal myositis.

To relieve pain secondary to the involvement of peroneal muscles, movement in the ankle was restricted over a long period. Once the symptoms had subsided, intensive physical therapy was necessary to regain the full range of motion.

The aetiology of focal myositis has not been clarified. The tumour-like muscle hypertrophy is caused mainly by proliferation of the interstitial connective tissue. It seems important to discuss this lorry driver's chronic venous congestion of the legs, due to the extended periods of time he spent in a seated position, as a possible cause of focal myositis and its recurrence. In the past, it has been suggested that myositis occurs secondary to trauma or infection [21, 22]. Some authors have suggested that rheumatoid arthritis, sarcoidosis and connective tissue disease may also manifest themselves as a focal process [19]. None of these theories was applicable to our patient.

As originally reported by Heffner [1], focal myositis is recognized as a benign inflammatory disease of muscle that presents as an isolated soft-tissue mass [3, 4]. In our case, the focal myositis had to be distinguished from other manifestations of vasculitis [6] and could easily be confused with polymyositis [23]. The most important sign of focal myositis, in contrast to polymyositis, found in the biopsy was the polyclonal mononuclear infiltrate in the perivascular spaces and interstitial connective tissue. In focal myositis, the lymphocytes never attack vital muscle fibres, as seen in polymyositis. Additionally, polymyositis, as a systemic disease, characteristically involves more than one muscle. Some cases of interstitial myositis are characterized by additional destruction and reduction of endomysial capillaries. Most of these cases show dermatological abnormalities consistent with a dermatomyositis. A reduction in the blood supply was not found in either the scintigraphy or the muscle biopsy. The endomysial capillary network was not reduced.

To exclude the development of a generalized disease process [6, 8, 18, 23], our patient was followed carefully over a period of 7 yr. No evidence for polymyositis or other systemic disease presented itself. Within the scope of our investigations, we found only elevated smooth muscle and skeletal muscle antibodies and elevated eosinophilic granulocytes. The detection of smooth muscle antibodies and skeletal muscle antibodies corresponds to the chronic damage in the vessel wall and the reaction of lymphocytes against necrotic skeletal muscle fibres. The eosinophilic component is unusual because of the lack of evidence for a parasitic disease. Signs of eosinophilic fasciitis, another of the differential diagnoses, were not noted.

Smooth muscle antibodies have been described in cases of multiple sclerosis [24], graft-versus-host disease [27] and liver diseases [25, 26]. A liver affection was excluded with the help of liver MRI, ultrasound and serum investigations. The ^{99m}Tc -HDP multiphase scintigraphy revealed hyperaemia of the affected muscles (Fig. 4) and excluded bone affection as a cause of the

pain. To our knowledge, this is the first image of a focal myositis obtained with this technique.

In many cases of focal myositis the lesion disappears spontaneously, and very few are recurrent [13, 14, 16, 17, 20, 21]. Surgical excision can be useful to remove the mass and has been performed in nearly 60% of reported cases (Table 4) [1, 3, 5–8, 10, 13, 19]. Immunosuppressive or radiation therapy may be beneficial in progressive cases, but there is little experience of this and the risk of side-effects is high [11, 12, 18]. Focal myositis can be treated successfully with steroids or non-steroidal anti-inflammatory drugs (NSAIDs) [2, 5, 9, 14, 15]. In our patient, NSAIDs were effective. However, after discontinuation of the therapy the disease recurred. This raises the question of the appropriate duration of conservative medical treatment of focal myositis, especially in cases of recurrent episodes. Long-term, continuous anti-inflammatory medication may be warranted. For long-term treatment, a specific cyclooxygenase 2 (COX-2) inhibitor was chosen to reduce the incidence of gastrointestinal complications [28]. At the 6 month follow-up under COX-2 inhibition, the patient was free of adverse effects and showed no recurrence of the disease. This is the first report of focal myositis treated successfully with COX-2 inhibitors. These drugs may be a valuable addition to the spectrum of treatment modalities, especially when long-term therapy is required for cases with recurrent focal myositis. A secondary joint affection may require additional therapy, as pointed out in this report.

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