Calcific myonecrosis: diagnostic dilemma

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ABSTRACT

Calcific myonecrosis is a rare benign condition affecting mainly the muscles of a single leg compartment. It is thought to follow a history of trauma with a latent period of years. Patients present with a slowly growing mass. Differential diagnosis from a malignant tumour can be made from the history and the distinctive radiographical features of a fusiform lesion with predominantly peripheral calcifications. Magnetic resonance imaging may be necessary to confirm the diagnosis; treatment is largely symptomatic.

KEYWORDS

Calcific myonecrosis – Soft-tissue sarcoma – Tibialis anterior

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Introduction

Calcific myonecrosis is a rare condition affecting predominantly the muscles of the lower extremities. The aetiology and pathogenesis of the condition are not fully understood. It has been reported in the literature through a handful of case reports and was first described by Gallie *et al.*¹ as a sequelae of compartment syndrome of the leg. Trauma and neurovascular injuries have also been postulated as the genesis of this condition.^{2–5} Patients tend to present with a slow growing mass on the leg over a period of years and, often, patients recall a history of minor trauma to the calf muscles or anterior shin.^{2,5,6} As the mass grows in size, it becomes troublesome, with a pressure effect on the surrounding tissues. A growing mass will understandably raise alarms with patients and treating physicians for potential malignancy, as it can mimic a soft-tissue tumours.^{7–10} An inquisitive history and a thorough clinical examination, together with plain radiographs and advanced imaging, are essential tools for reaching an accurate diagnosis and managing this rare condition.

We present a case of calcific myonecrosis in a 60-year-old man that mimicked a soft-tissue tumour and highlight the distinguishing features, to aid the diagnosis of this rare and challenging condition and its current management.

Case history

A 60-year-old man presented with a long-standing, slowly enlarging mass on the antrolateral aspect of his leg. The mass has become troublesome, with frequent bruises and cuts from trivial superficial trauma to his leg. The mass was large in size (15 × 8 cm) and hard in consistency. It was not

adherent to the underlying skin and caused no neurovascular deficit. The patient experienced no night pain, weight loss or any other systemic features of malignancy. His past medical history included diet-controlled hypertension and he was taking no medication. He had sustained an ipsilateral proximal femur fracture 10 years previously, when falling from a ladder, but no fractures around the leg. He worked as a driver, had no smoking history and drank alcohol socially. His routine blood tests, including inflammatory markers, liver function tests, renal function and bone profile, were all within normal limits.

Plain radiographs (Fig 1) demonstrated a distinctive appearance of a fusiform mass with peripherally oriented sheet-like calcifications in the anterior compartment of his leg. There were mixed lucent areas and smooth bony erosions due to the pressure effect but minimal periosteal reaction with no destructive or permeative features. Magnetic resonance imaging (MRI; Figs 2–3) demonstrated a well-circumscribed fusiform mass with a homogenous signal throughout, occupying most of the anterior compartment and the tibialis anterior muscle without invading any fascial planes or infiltrations into adjacent soft tissues. These features are consistent with a benign lesion distinguishing calcific myonecrosis from other mineralising soft-tissue tumours. The mass showed no enhancement with gadolinium administration.

The patient underwent a thorough tertiary tumour centre multidisciplinary team review, which confirmed his diagnosis as a benign calcific myonecrosis. He was therefore treated symptomatically with planned annual follow-ups. Subsequent radiographic assessment at 12-month showed no change.

Figure 1 Anteroposterior and lateral radiograph of the right leg demonstrating a calcified lesion antrolaterally with distinct radiographic features of smooth pressure erosion affecting the outer cortex of the adjacent bone and peripheral calcifications of soft tissues which are thin with a sheet-like configuration around the margin of the lesion in keeping with calcific myonecrosis

Discussion

The aetiology of calcific myonecrosis is debated in the literature.^{3,11–15} There are only few case reports published on this condition. Most of these cases have a reported history of previous trauma as the ensuing factor with a latent period of years before this slowly growing mass had appeared. Laboratory values were typically within normal limits. However, the key to this diagnosis seemed to be in the distinctive radiographical features, both on plain radiography and MRI. These include a well-circumscribed or fusiform mass with peripheral calcification and central liquefaction.^{6,14} MRI is essential for distinguishing between benign and malignant features of high signal intensity and enhancement.

Differential diagnoses are varied but include myositis ossificans and malignant soft-tissue tumours with propensity to mineralise such as synovial sarcoma. Sarcomas are very

Figure 2 (a) Coronal T1-weighted image demonstrating a mass with a homogenous low signal measuring 14.87 cm in the anterior compartment of left leg with no bony involvement. (b) Coronal T2-weighted image with uniform homogenous low signal and no oedema persistent with a benign lesion

Figure 3 Gadolinium-enhanced axial magnetic resonance imaging of the leg at the level of the lesion measuring 45.27 × 39.22 mm in cross-section with no enhancement and homogenous low signal

aggressive lesions, however, and enhance with contrast, infiltrate different groups of muscles and lack peripheral calcification.^{14–16} On the other hand, myositis ossificans typically develops shortly after a history of trauma and is limited to small islands lacking expansion of the lesion. Macroscopic findings of confirmed calcific myonecrosis lesions were reported as yellow–brown pasty material. The cystic walls were found to be composed of hypocellular fibrous tissue with focal aggregates of hemosiderin-laden macrophages. Histopathological examination showed cystic

contents of necrotic muscle and debris composed of cholesterol, fibrin, and haemorrhagic materials, as well as embedded fragments of calcified material.^{2,5,12}

The management of calcific myonecrosis is also debated. A significant proportion of reported cases who underwent surgical biopsies or operative excision developed complications with discharging sinuses, recurrent infections and wound healing problems requiring muscle flaps and soft-tissue coverage.^{2,4,10,17–19} Therefore, once the benign nature of the lesion in question is confirmed, symptomatic treatment is advocated.

To conclude, calcific myonecrosis is a rare benign condition affecting mainly muscles of a single leg compartment and is thought to follow a history of trauma with latent period of years. Patients present with a slowly growing mass that may become troublesome. Differential diagnosis from a malignant tumour can be made with a history and the distinctive radiographical features of fusiform lesion with predominantly peripheral calcifications. MRI may also be necessary to confirm the diagnosis and treatment is largely symptomatic.

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