



Post-traumatic calcific myonecrosis of Flexor Hallucis Longus A case report and literature review

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Calcific myonecrosis is a rare, late complication of compartment syndrome in the lower extremity. In this condition an entire single muscle of the leg is replaced by a fusiform mass with central liquefaction and peripheral calcification. Calcific myonecrosis presents a diagnostic dilemma to the clinician ; it has to be considered in the differential diagnosis of a calcifying soft tissue tumour in the lower extremity. The purpose of this report is to highlight the importance of recognition of the lesion and its key clinico-pathological presenting features leading to appropriate management. We describe the unique presentation, diagnosis and surgical management of calcific myonecrosis involving only the flexor hallucis longus muscle of the leg in a middle-age adult. We found MRI Scan as the most useful method of investigation. Diagnosis can be confirmed by yellow-brown paste like material within the lesion intra-operatively or by aspiration and further by histology. We recommend complete excision of the lesion and closure of the wound with compression dressing, to avoid secondary infection.

Keywords : calcific myonecrosis ; post traumatic ; lower extremity ; compartment syndrome ; management.

INTRODUCTION

Calcific myonecrosis is a rare, late complication as a result of compartment syndrome in the lower extremity. In this condition an entire single muscle of the leg is replaced by a fusiform mass with central liquefaction and peripheral calcification (2,6,9).

Calcific myonecrosis presents a diagnostic dilemma to the clinician, and it has to be considered in the differential diagnosis of a calcifying soft tissue tumour in the lower extremity (5,9,15). The purpose of this report is to highlight the importance of recognition of the lesion and its key clinico-pathological presenting features leading to appropriate management.

To our knowledge this is the first report in English literature of calcific myonecrosis occurrence involving only the flexor hallucis longus muscle. We describe the unique presentation, diagnosis and surgical management of calcific myonecrosis involving only the flexor hallucis longus muscle in a middle aged adult.

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CASE REPORT

A 45-year-old man presented with a slowly enlarging mass in the posterolateral aspect of the right leg. The mass had been gradually increasing in size over a period of five years, and was mildly tender. Clinically he was well with no systemic symptoms.

He had been involved in a road traffic accident more than 25 years previously, and had sustained an open fracture of the tibia and fibula; he was treated with wound debridement and plate fixation of the fracture within 6 hours of injury. Postoperatively he developed compartment syndrome and had to undergo fasciotomy of the leg; he made a good recovery. He had the plate removed from his leg two years after initial injury when the tibial fracture had healed.

On clinical examination the findings were of a tender fusiform mass in the posterolateral aspect of the right leg and it was firm in consistency. There was no evidence of any nerve injury in the right leg from the initial injury which he had sustained more than 25 years previously. Range of movements at the ankle was good.

Blood tests for inflammatory markers, bone and renal profile were normal. Plain radiograph of the right leg showed large areas of soft tissue calcification (fig 1). There was peripheral calcification within the lesion and erosion of fibula and distal half of the tibia. There were no lytic changes in the tibia or fibula or any radiographic signs of chronic osteomyelitis.

MRI scans of the right leg showed an area of muscle necrosis with a large peripherally calcified cavity replacing the flexor hallucis longus muscle.

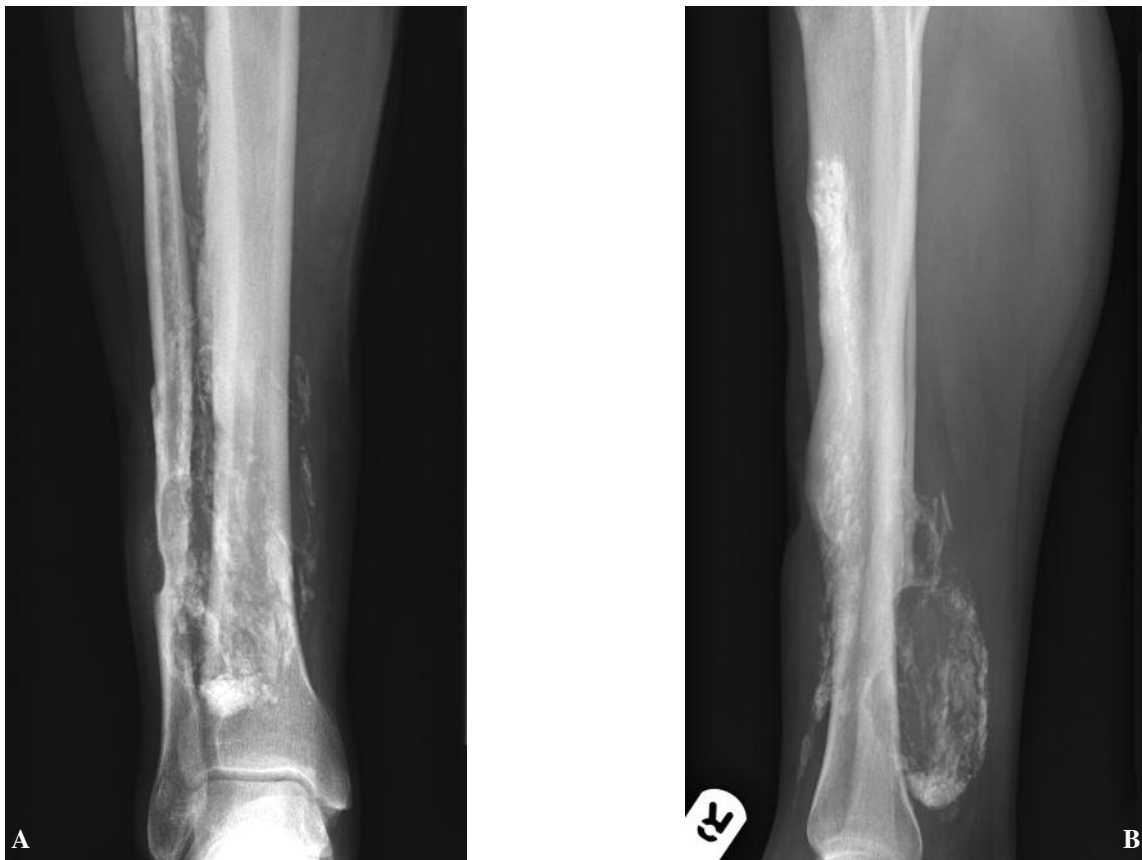


Fig. 1. — Radiographs of the 66-year-old patient with calcific myonecrosis of flexor hallucis muscle. A & B : anterior-posterior and lateral view of right leg showing a fusiform mass with flake-like peripheral calcification. Calcification is more in the inferior pole of the mass.

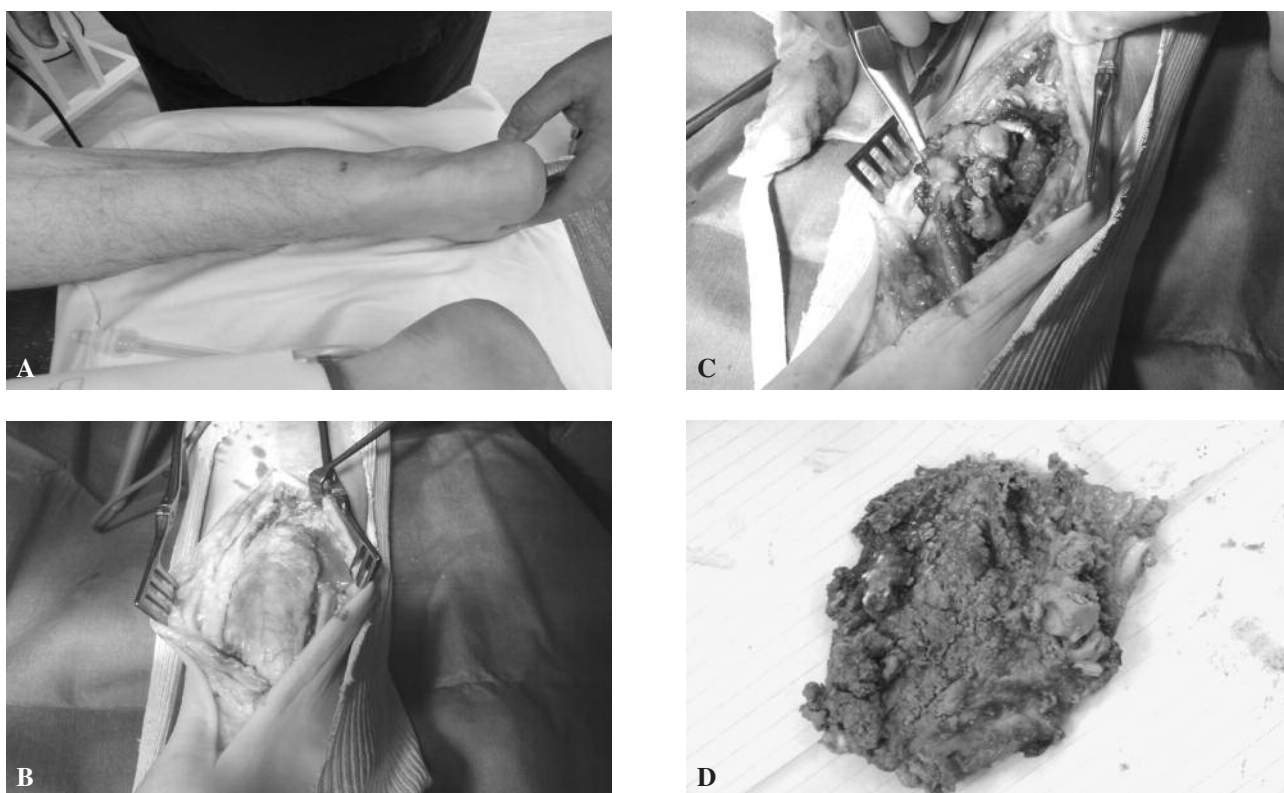


Fig. 2. — Intraoperative pictures. A : Fusiform mass in posterior aspect of lower half of the leg. B : Calcified mass of the Flexor Hallucis Muscle in leg. C : Gross appearance of the mass, granular brownish pasty material with necrotic muscle with cystic changes. D : Mass excised completely measuring $12 \times 8 \times 5$ cm.

Radiological diagnosis was of a chronic infected abscess cavity.

Excision biopsy was undertaken under general anaesthetic via a posterior approach, with a tourniquet in place. Exploration of the posterior compartment of the calf revealed a single well-contained mass measuring $12 \times 8 \times 5$ cm. It was free from the surrounding tissues and was in the anatomical location of the flexor hallucis longus muscle (fig 3). The lesion contained yellow brown pasty material and calcified debris in the large cavity. Pressure erosion on the adjacent tibia and fibula was noted contiguous to the deep surface of the mass.

Microscopic examination showed a dense fibro-cystic wall with calcification and bone formation focally (fig 3). There were significant amounts of amorphous eosinophilic material and dense fibrous tissue with dystrophic calcification. Histological diagnosis was of calcific myonecrosis. No viable,

malignant, or inflammatory cells were found. Cultures were negative for any organisms.

Post-operatively the patient recovered well without any complications and there was no recurrence of the lesion.

DISCUSSION

Calcific myonecrosis is a rare late sequel of trauma to the extremity. The exact cause of this condition is unknown, most of the cases reported in the literature are attributed either to compartment syndrome or nerve injury. There have been approximately 40 cases that have been reported in English literature to date (1-15). The mean time between the injury and diagnosis was 37 years (range 10-64 years), and the mean age at presentation for all the cases reported in literature is 51 years (range 34-87 years) (1,3-9,11,12,14,15).

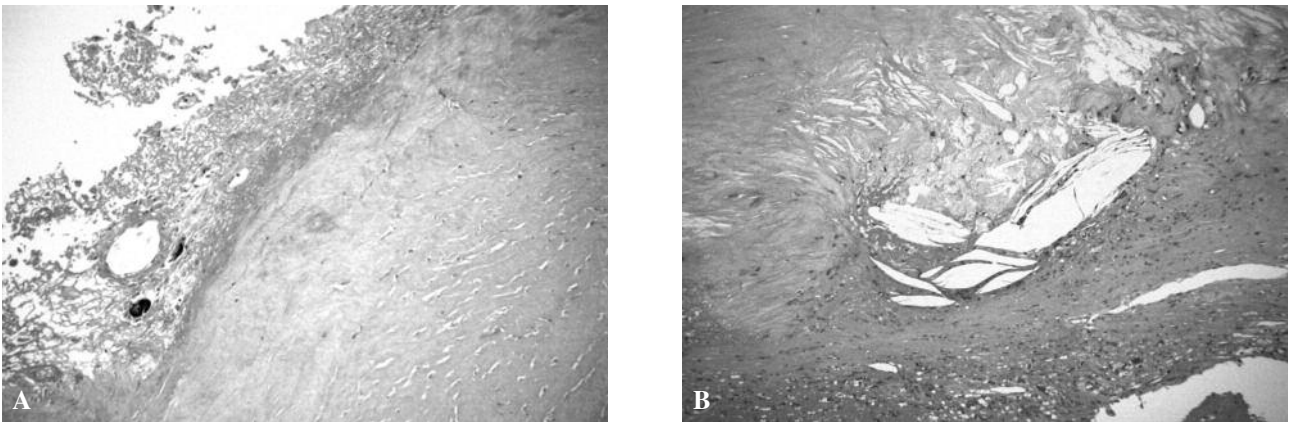


Fig. 3. — Histology. A and B : Wall of the mass showing dense fibrous tissue with abundant amorphous eosinophilic material and embedded with foci of calcified material.

This condition often mimics soft tissue tumours both clinically and radiologically because of the prolonged delay between the time of injury and presentation with a soft tissue mass (5,9,15). Our case was discussed at the tumour interest group before surgery.

The typical radiological feature of this lesion was a large fusiform soft tissue mass with peripheral plaque-like calcification in the posterior compartment of the leg. Adjacent erosion and periosteal reaction of the tibia and fibula were seen in some cases. As a result of the rarity of this condition and the invasive radiological appearance, it mimics soft tissue calcifying sarcomas like epitheloid sarcoma, synovial sarcoma, soft tissue osteogenic sarcoma and chondrosarcoma.

Most of the cases reported in the literature involved patients with a history of trauma with the exception of two cases, in the report of Janzen *et al*, which were not specified (5). Further breakdown of the patients reported in literature with a history of trauma consisted of eighteen tibias, two fibulas, six femurs, one ipsilateral femur and tibia, one ankle, three gunshot injuries, two knee ligament injuries, five blunt traumas of the leg and one crush injury in the upper extremity which were associated with calcific myonecrosis. Common complications included compartment syndrome, vascular problems and neurological injuries. How is the case reported here similar or different to these previous reports ?

In our reported case, the lesion involved only one single muscle in the posterior compartment. Majority of the cases reported involved the anterior compartment and three cases involved both the anterior and posterior compartments (9,12,14,15).

There are different treatment options reported in literature. Treatment options range from incision and drainage (6), repeated aspiration of the lesion (6, 10,13), observation of the intact compartment if otherwise stable (5,14) to debridement of the mass and covering the defect with a muscle flap (2,4,11).

A few reported cases had chronic drainage after an open biopsy. Incomplete excision and packing of the wound with dressing resulted in infection, a chronic discharging sinus and amputation. Seven cases reported in the literature were associated with infection at presentation. O'Keefe *et al* reported a case of hypotension and cardiac arrest at the end of the excision of a large calcific myonecrosis of the leg and packing of the wound with dressing was done because of massive post operative bleeding (9). The patient eventually died of a gastrointestinal complication two months later. Zohman *et al* reported successful total excision of the lesion, closure of the wound over the suction drain, followed by application of a compression dressing, which resulted in gradual healing of the wound without residual infection or recurrence of the lesion (15).

In the case reported, we undertook complete excision of the cavity in an effort to achieve complete eradication of the pathology.

To conclude, calcific myonecrosis of the leg is an important differential diagnosis in case of a slowly enlarging mass of the leg several years after trauma and if the imaging reveals a fusiform mass in either the anterior or posterior compartment of the leg with peripheral calcification. It is important to differentiate this from neoplastic conditions on the radiographic appearance, to avoid unnecessary morbidity associated with an incorrect diagnosis of a tumour. We found MRI Scan as the most effective method of investigation.

Diagnosis can be confirmed by finding of yellow-brown paste like material within the lesion intra-operatively or by aspiration and further by histology. We recommend complete excision of the lesion and closure of the wound with compression dressing, to avoid secondary infection.

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