CASE OF THE MONTH

A calcified conundrum

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A 62-year-old female patient visiting from abroad presented to casualty with a three week history of a discharging skin lesion on her right ankle, which had not improved despite oral antibiotics. The lesion was painless and discharging white, chalky fluid. She also complained of nausea but no vomiting.

There was a past history of severe trauma when she was 15, during which she sustained multiple fractures, including a femoral shaft fracture and a haematoma

compressing her right common peroneal nerve. After internal fixation of the femur and evacuation of the haematoma, she received a year of intensive physical therapy. Subsequently, she walked unaided but had residual loss of power and sensation in her right leg.

On examination, there was a discharging sinus with surrounding erythematous skin over the patient's ankle anteriorly. The discharge was a white, viscous fluid with clumps of solid calcific material within it. Analysis of the discharge grew skin flora only. The right calf was significantly smaller than the left calf, and the findings

Figure 1. AP radiographs of tibia and fibula.

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Figure 2. Lateral radiographs of tibia and fibula.

Figure 3. Pre-contrast axial CT of the calf.

of the clinical examination were in keeping with a peroneal nerve palsy. The patient was afebrile.

Radiographs of the patient's right leg were made (Figures 1 and 2). Subsequently, a CT scan (Figures 3 and 4) and MR scan (Figure 5) of the right leg were made. What are the radiological abnormalities demonstrated? What is the diagnosis?

Figure 5. T_1 weighted axial MRI of the calf.

Figure 4. Pre-contrast sagittal CT of the calf.

Findings and diagnosis

Figures 1 and 2 show extensive calcification surrounding almost the entire tibial and fibular diaphysis. The calcification is linear and sheet-like but does not involve the ankle joint. The axial CT image through the leg (Figure 3) demonstrates peripheral calcification of all four, atrophic muscular compartments of the leg. The central area of the muscle compartment is of low density. Figure 4 is a sagittal CT of the leg that reveals the extent of the calcification in the different muscular compartments. Figure 5 is a T_1 weighted axial MRI confirming the peripheral calcification of the muscular compartments, which was of low signal on all sequences.

The diagnosis is calcific myonecrosis with spontaneous sinus formation, a late complication of the patient's lower limb trauma. The patient underwent debridement of the sinus, but the lesion continued to discharge. It was a late complication of the patient's lower limb trauma.

Discussion

Calcific myonecrosis is a rare sequel of trauma, typically presenting with a slowly enlarging, painful, soft tissue mass in the lower limb. An entire muscle or compartment is replaced with central liquefaction and peripheral calcification. Presentation typically occurs several decades after lower extremity trauma, often causing clinicians to overlook the significance of the trauma and mistake the entity for a soft tissue neoplasm.

The trauma is often associated with neurovascular complications, particularly peroneal nerve injury, as in our case [1]. This late complication was first described by Gallie and Thomson in 1960 [2]. It occurs almost exclusively in the leg, particularly in the anterolateral compartments, although some case reports have described involvement of the foot [3] and forearm [4]. The pathophysiology is uncertain, it is thought that increasing pressure in a fascial compartment results in necrosis and fibrosis [5]. Haemorrhage occurs within the compartment resulting in calcification. With recurrent haemorrhage, the mass expands correlating to the typical presentation of an enlarging mass in the limb [3].

Imaging can confirm a diagnosis of calcific myonecrosis and helps to differentiate it from other causes of calcification in soft tissue. The differential diagnosis for soft tissue calcification includes myositis ossificans, dermatomyositis, tumoural calcinosis and diabetic myonecrosis. Radiographs show sheets of calcification replacing muscle. CT typically demonstrates atrophic muscle

with peripheral, linear calcification extending along the fascial plane. The most common location is the anterior compartment of the leg [6]. Other CT findings are erosions and scalloping of adjacent bone. Within the peripheral calcification is a central area of liquefaction, which displays low density and sometimes calcium fluid levels [6]. MRI shows peripheral low signal intensity on all sequences, in keeping with calcification. The central area of liquefaction returns high signal on T_2 weighted sequences and intermediate signal on T_1 weighted sequences. However, some cases have involved T_1 weighted high signal, which is due to blood breakdown products or a proteinaceous content [6]. There is no enhancement of the mass with gadolinium.

Conservative treatment has been advocated due to the high complication rate of biopsies and surgery [1]. Infection and chronic draining sinuses are well-documented complications, but they are usually post procedural. Spontaneous sinuses have been previously reported [3]. The surgical option for symptom relief is usually complete debridement with flap coverage or healing via primary or secondary intention.

Calcific myonecrosis is a rare complication of trauma with diagnostic appearances on imaging. Due to its delayed presentation, its traumatic aetiology is often overlooked. It is important that this entity is recognised because biopsies and surgery may lead to serious complications.

References

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