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# Ischemic Necrosis of Muscles of the Buttock

## A CASE REPORT

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Ischemic necrosis of skeletal muscle is rare because muscle has so rich a blood supply. Most of the cases which have been reported had involvement of the anterior tibial group of muscles, and trauma or overexertion, frequently found in military personnel, was considered important in causing the lesion to occur.

The occurrence of this lesion in other muscle groups is very rare indeed. In the case to be described there was idiopathic infarction of muscles in the buttock with particular involvement of the piriformis muscle and with secondary effects on the sciatic nerve.

### Case Report

A thirty-four-year-old black porter was admitted to the Brookdale Hospital Center in October 1969 with a rapidly enlarging mass in his left buttock. There was an associated numbness of the lateral aspect of the left leg and foot and a foot drop that had developed two weeks prior to admission. The mass was painless and there was no history of trauma or infection. On palpation there was a deep-seated firm mass apparently occupying most of the left buttock, fixed to deeper structures but not attached to skin. There was mild tenderness but no local heat or redness of the overlying skin. There was generalized weakness and atrophy of the muscles innervated by the sciatic nerve in the left lower extremity and there was paresthesia in the distribution of the peroneal nerve. The general physical findings were normal except for a fever of 37.7 degrees centigrade.

The laboratory data included a normal urinalysis, a hemoglobin ranging from 12.2 to 13.6 grams, a sickle cell trait with direct smear negative for sickling but with a sickle cell preparation showing 90 per cent sickled cells. The hematocrit was 40 to 43 per cent, the white blood count 13,000 with 81 per cent neutrophils, and the serum electrolytes, serum proteins, blood glucose, blood urea, blood uric acid and serum enzymes all within normal limits. The tuberculin purified protein derivative test was positive, and the histoplasmin test was negative. Electromyography revealed denervation potentials of the left anterior tibial muscle and of the medial head of the gastrocnemius. Normal findings were present in the rectus femoris and vastus medialis muscles.

Roentgenograms revealed a poorly demarcated large soft-tissue mass in the left buttock (Fig. 1), but a skeletal and pulmonary survey showed no abnormality.

The clinical impression was sarcoma, most likely rhabdomyosarcoma. Needle biopsy was attempted on two occasions but the tissue obtained contained only degenerating muscle or connective tissue. Open biopsy showed a normal gluteus maximus, but the gluteus minimus and piriformis were pale gray, firm, and swollen, especially the piriformis which was approximately twice usual size. The center of the muscle appeared to be hemorrhagic and necrotic. The swelling had compressed the sciatic nerve but there was no evidence of invasion of the nerve and the two muscles were carefully removed leaving the nerve intact.

Postoperatively, the course was not unusual with gradual recovery of function of the muscles of the limb and restoration of sensory loss. When seen in the follow-up clinic a year following surgery there was no evidence of recurrence of the mass and functional recovery was almost complete.

The lesion consisted of a replacement of normal skeletal muscle by necrotic areas surrounded by zones of cellular and fibrous tissue. Centrally, there was an area of sharply demarcated ischemic necrosis resembling infarcted tissue with muscle-cell outlines still discernible.

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FIG. 1

Roentgenogram of pelvis. The pelvic bones and femora show no involvement by the lesion.

The cells exhibited loss of nuclei and striations. Peripheral to this was a zone of proliferating highly vascular fibrous tissue with a cellularity suggestive of sarcoma in places. Giant cells were present in this layer and in the surrounding muscle, mostly with eosinophilic cytoplasm and containing multiple nuclei (Fig. 2). In some, striations were visible. Adult collagenous tissue radiated from this into the surrounding muscle forming septa subdividing muscle groups. Areas of liquefactive necrosis of tissue were visible in the central areas. Hemosiderin pigment staining strongly positive for iron was present mostly in macrophages in the dense collagenous periphery.

Minimum inflammatory reaction was visible mainly consisting of small perivascular collections of lymphocytes. Endarteritis of small vessels was present in the lesion but no remarkable changes were evident in the arteries in the surrounding tissue.

There was no formation of osteoid tissue.

### Discussion

The clinical impression, that of a malignant tumor of soft tissue, probably arising in muscle, was derived from the dense and poorly circumscribed gross appearance of the lesion, with evidence of central necrosis and some hemorrhage. The frozen section examination, however, showed that the lesion was non-neoplastic and suggested the possibilities of myositis ossificans circumscripta, proliferative myositis, or a lesion of ischemic origin, although no vascular lesion was seen.

The absence of a previous history of trauma and the absence of any evidence of bone formation in the lesion was against the diagnosis of myositis ossificans. Some of the features of this case seemed to correspond with the description of proliferative myositis as first described by Kern and later by Enzinger and Dulcey. These cases, however, occurred mainly in the arm or shoulder girdle, except for two cases in the thigh. They emphasized the dominance of a diffuse sclerosing process with minimum necrosis and muscle degeneration. The hallmark of the lesion, described as the large, ganglion-like cell with bluish cytoplasm, was absent in our material.

The possible development of this lesion as a result of ischemic infarction, was considered. No vascular lesions were present in the neighboring arteries; there was

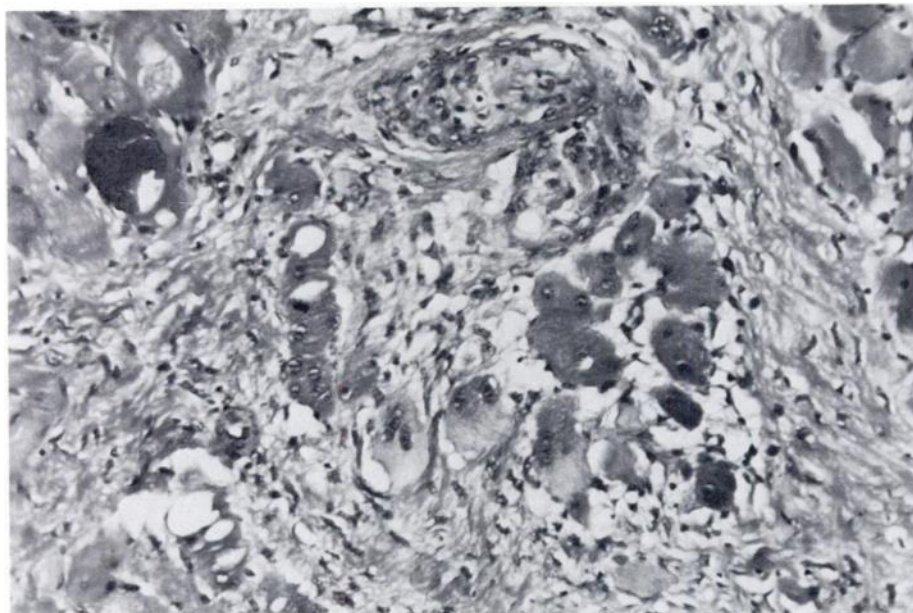


FIG. 2

Isolated muscle fibers in dense connective tissue with multinucleated giant cells (hematoxylin and eosin,  $\times 200$ ).

no sign of vasculitis or thrombosis. The patient was shown to have sickle-cell trait and localized infarctions in conditions of anoxia are common in those with sickle-cell trait<sup>2</sup>. However, these are usually located in the viscera, for example the spleen or kidney, although peripheral infarcts do occur. No thrombi or clumping of red cells was found in the regional arteries near the lesion.

The presence of a large area of geographic necrosis also raises the question of a possible vascular mechanism similar to that described in the anterior tibial muscle syndrome<sup>1,4,5,7</sup>, with the production of ischemic necrosis without obvious vascular occlusion. Despite the unusual location, which may be unique, this case may well represent an ischemic infarct of the muscles of the buttock, secondary to trauma or to sickle-cell trait.

### Summary

The incidence of ischemic necrosis in skeletal muscle is low. The usual site of occurrence is the anterior tibial group of muscles, related to exertion particularly in military personnel, or to trauma. Lesions of this type occur elsewhere only rarely if at all.

A case is described of a thirty-four-year-old black man who appeared with a rapidly enlarging mass in the left buttock causing a sciatic-nerve palsy. The clinical impression of malignant neoplasm was not confirmed by the histology which revealed a non-neoplastic lesion with characteristics that were initially interpreted as a sclerosing lesion of muscle, but later, on consultation, it was considered to be an ischemic lesion resembling an infarct.

The possible relationship of this lesion to the patient's sickle-cell trait or to unnoticed trauma is discussed.

A two-year follow-up of the patient has shown complete recovery of function of the muscles in the sciatic-nerve distribution and complete healing in the area of the lesion.

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