Popliteal vascular malformation simulating a soft tissue sarcoma

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Abstract Differentiation of vascular abnormalities from soft tissue sarcomas may be difficult on clinical grounds, but is usually possible on imaging criteria. We report the MRI and digital subtraction angiography (DSA) findings in a patient presenting with a mass behind the knee. We discuss differentiating features and review the literature of similar cases.

Key words Soft tissue sarcoma · Aneurysm · Vascular malformation · MRI · Digital subtraction angiography

Case report
A 52-year-old male schoolteacher presented with a 10-year history of fullness behind the left knee, which had initially been painless, but immediately prior to presentation the mass had increased in size and been associated with intermittent cramping pain. There was no history of significant trauma.

Examination revealed an 8-cm mass in the left popliteal fossa, which was non-pulsatile and non-tender. The transmitted pulsation of the popliteal artery could be detected through the mass. Peripheral pulses were normal. Radiographs were not performed.

The mass was clinically diagnosed as a soft tissue sarcoma and referred for surgery. MRI was performed for confirmation and staging. This suggested that the mass was vascular in nature; however, the possibility of a sarcoma could not be entirely ruled out, and therefore digital subtraction angiography (DSA) was undertaken for further evaluation.

MRI (Fig. 1) demonstrated a large circumscribed mass within the popliteal fossa, slightly heterogeneous on all sequences, and measuring up to 10 cm in diameter. It was intimately related to the popliteal artery and in continuity with an enlarged popliteal vein. The signal characteristics on T1-weighted images (not shown) were slightly hyperintense compared
to muscle, with some accompanying mild inhomogeneity and scattered low signal foci. On T2-weighted and gradient echo images, it was of high signal intensity with scattered low signal foci. The overall pattern suggested mixed areas of slow flow, thrombosis and fibrosis with possible calcification. A soft tissue sarcoma with foci of calcification could not be entirely ruled out.

Angiography (Fig. 2) demonstrated a direct communication between the mass and the popliteal artery as well as parasitization of small muscular branches of geniculate arteries. Delayed images showed the presence of large vascular channels adjacent to and compressed by the mass, draining into a massively dilated popliteal vein. The differential diagnosis at this stage included either a