Radiology for the surgeon
Musculoskeletal case 37

Presentation

A 42-year-old man was playing football when he noticed pain in the left thigh after a twisting motion. The pain failed to resolve with the usual soft-tissue injury regimen, so he approached his family physician who ordered radiographs (Fig. 1). On the basis of the plain radiographic findings, MRI was performed. Figure 2 is a representative sagittal gradient echo image, and Figure 3 a transverse axial T2-weighted image.

What is the most likely diagnosis?
Diagnosis

Diaphyseal mid-femur telangiectatic osteosarcoma

The anteroposterior and lateral plain radiographs (Fig. 1) demonstrate an ill-defined expansile lytic lesion involving the diaphysis of the mid-femur. A central osteoid matrix was seen.

On sagittal gradient echo MRI (Fig. 2), a lesion of intermediate signal intensity was visualized, with absence of a soft-tissue mass. The axial T2-weighted image (Fig. 3) again demonstrated the cystic nature of the mass with multiple fluid-fluid levels within various locules of the lesion. A coronal short tau inversion recovery (STIR) weighted image (Fig. 4) revealed cystic, hemorrhagic and bony mass filling the medullary cavity, 10.5 cm long and 3 cm in diameter. The resection margins measured 5.9 cm proximally and 4.4 cm distally. Dilated lakes of blood were present, and the cortex was partially eroded.

Microscopic examination revealed a high-grade osteosarcoma based in the medullary cavity, with a telangiectatic and osteoblastic growth pattern (Fig. 6). The tumour focally eroded through cortex but remained confined by perios- teum. Less than 10% was necrotic; most of the osteosarcoma cells were histologically viable.

Telangiectatic osteosarcoma is an aggressive rare type of osteosarcoma comprising 5% of all osteosarcomas.1,2 The clinical presentation is usually local pain, a soft-tissue mass and a fracture.3 Males are affected almost twice as frequently as females, and most patients are aged between 10 and 20 years, similar to conventional osteosarcoma.4 Most tumours are formed in the metaphysis of long bones although, as in our case, they may arise in the diaphysis. Plain radiographs show an osteolytic tumour with little or no matrix or periosteal reaction.19 CT or MRI of a telangiectatic osteosarcoma often shows a fluid-fluid level, indicating the presence of intraluminal hemorrhage,1 particularly on T2-weighted images. Fluid-fluid levels are not specific and can be seen in aneurysmal bone cysts, giant cell tumours, fibrous dysplasia and unicameral bone cysts.6–8 Pathologically, telangiectatic osteosarcoma is characterized by large cavities filled with fresh or clotted blood or necrotic tissue, with septa composed of anaplastic tumour cells.2 Early papers describe a poor prognosis, but more recent work employing neoadjuvant chemotherapy plus surgery has demonstrated survival rates better than conventional osteosarcoma.4

Competing interests: None declared.

References