History: 15 year old with low back pain with multiple activities
What's the Diagnosis – Case 53

Sagittal IR

Sagittal T1
What's the Diagnosis – Case 53

Axial T2 images of mid lumbar spine
Axial T2 images of mid lumbar spine
Axial T2 images of mid lumbar spine
Axial T2 images of mid lumbar spine
Axial T2 images of mid lumbar spine
Axial T2 images of mid lumbar spine
Multiple axial CT images
What's the Diagnosis – Case 53

Multiple axial CT images
Multiple axial CT images
Multiple axial CT images
Multiple axial CT images
Coronal CT Reformation
Coronal CT Reformation
What's the Diagnosis – Case 53

Coronal CT Reformation
Subtle periosteal bone about the right L3 transverse process
Surrounding edema at the site of periosteal bone

High T2/Low T1 Transverse process
Surrounding low signal at the site of periosteal bone
High signal of the transverse process with oval focus.

Surrounding low signal at the site of periosteal bone
Oval lucency

Periosteal bone
Oval lucency

Linear Lucency
Diagnosis: Transverse Process Stress Fracture

Cases have been presented previously of stress fracture but this case highlights an unusual fracture found infrequently with frequent flexion/extension and rotation activities. It also shows the often subtle nature of findings on radiographs and their difficult interpretation. In this case, the periosteal bone relates to early fracture healing and the central, oval lucency likely represents bone resorption at the site of the fracture. Although the oval lucency may on the surface appear to represent an osteoid osteoma, it does not have the classic well demarcated circular appearance nor any ossified central portion to suggest a nidus. In addition, the history is much more suggestive of an overuse injury than osteoid osteoma.
This case highlights an important differential diagnosis particularly in the pediatric population where there is focal periosteal bone/cortical thickening. As in this case a stress fracture and osteoid osteoma should be considered. In addition, infection, particularly a more chronic infection and eosinophilic granuloma should be considered. The architecture of the findings but also the history are important in reaching the correct diagnosis. As shown in this case, the complimentary nature of multiple studies can also not be stressed enough in reaching the correct diagnosis.