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Pigmented Villonodular Synovitis of a Lumbar Facet Joint

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Summary: We describe the CT appearance of suspected pigmented villonodular synovitis involving a lumbar facet in a 51-year-old woman, and discuss how the histologic and radiologic appearances may differ from those of synovial cysts.

Index terms: Spine, facet joints; Neuropathology; Spine, computed tomography

Pigmented villonodular synovitis (PVNS) is a rare disorder of synovial joints, most commonly occurring in the knee, hip, ankle, and elbow (1–4). Few reports have demonstrated involvement of lumbar facet joints (2, 4). Computed tomography (CT) detection of high attenuation from hemosiderin deposition has been described in PVNS of the knee (5). This report describes an example where CT high attenuation was detected within a lateral extradural defect from lumbar facet joint PVNS. Preoperative distinction of PVNS from other extradural lesions is important because surgical treatment may require synovectomy (6).

Case Report

A 51-year-old woman presented with back pain and right leg radiculopathy following aerobic exercises. Her pain had kept her awake at night, had been particularly severe in the morning, and was somewhat relieved upon standing. Following failure of 6 months of physical therapy and nonsteroidal anti-inflammatory medications, she was referred for radiologic evaluation of possible disk herniation.

Plain films of the lumbar spine showed a mild anterolisthesis of L4 and L5, and L4-L5 facet joint sclerosis. Water soluble contrast myelography revealed a large right lateral extradural defect extending from slightly above the L4-L5 interspace down to just above the level of the L5 pedicle (Figs. 1A and 1B). On post-myelogram CT, a large right lateral L4-L5 extradural defect was confirmed that revealed increased attenuation (Fig. 1C). This was felt to represent a partly calcified extruded disk. Bone windows revealed slight widening of the medial aspect of the right facet joint (Fig. 1D), not appreciated at the time.

A posterior laminectomy was performed at the L4-L5 level. A large solid right lateral extradural mass was removed that was felt to represent an extruded herniated nucleus pulposus at the time of surgery.

Pathologic examination of the extradural mass demonstrated solid-tissue fragments with features typical of PVNS, including osteoclast-like giant cells accompanied by hemosiderin-laden macrophages, polygonal stromal cells, scattered neutrophils, areas of collagen formation with fibroblasts, and free hemosiderin granules (Fig. 1E). No nucleus pulposus fragment was identified in the specimen. No synovial lining and no evidence of a fibrous cyst wall was identified in any of the specimen fragments.

Discussion

PVNS is an uncommon disorder and primarily involves large joints (2, 3). Also known as “tenosynovial giant cell tumor, diffuse type,” PVNS is closely related to nodular tenosynovitis (tenosynovial giant cell tumor, localized type) which is a common tumor of the hands. While the lesion of nodular tenosynovitis is usually a single nodule, PVNS tends to produce a diffuse lesion with joint destruction. The differences between these tumors are probably primarily a consequence of their locations (7).

Gross examination or aspiration of PVNS lesions typically yields yellowish brown material. Histologic examination reveals fibrous trabeculae separating cellular aggregates of histiocytes with scattered giant cells and hemosiderin-laden macrophages (1, 6). Radiographic findings include...
Fig. 1. A and B, Lateral (A) and right posterior oblique (B) views from water soluble contrast myelography demonstrate a large right lateral extradural defect at the L4-L5 level, near the facet joint, and a slight anterolisthesis of L4 on L5.

C, Post-myelography CT shows increased attenuation (arrow) within the extradural mass.

D, Bone windows from the CT show a small erosion along the medial aspect of the right L4-L5 facet joint (arrow).

E, Photomicrograph from histologic section of the resected mass shows solid sheets of polygonal stromal cells, macrophages, and clumps of hemosiderin granules (arrows). In adjacent fragments, osteoclast-like giant cells are also present (inset). No fibrous wall or synovial lining was identified. (Hematoxylin and eosin, X400).
find ing of a solid mass, and by the pathologic
ent in this case. The current case of
attenuation and no evidence of fluid, the surgical
scribed soft tissue mass with central increased
stromal and giant cells are not found. Fragments
complicated cysts have only fibrous tissue in the cyst
synovial cells oriented toward the lumen.
Joints, most commonly L4-L5, and may cause
can be seen in the center of the cyst on CT (13–15).
be seen if the center is fibrous or gas (11-12). Fluid density material or gas may
Central signal hyperintensity similar to that of
may be due to either calcification or hemorrhage
show a cyst wall (12, 13). Increased attenuation
round, well-circumscribed, and on CT may dem­
radiculopathy (11, 12). These lesions are typically
lateral extradural defects adjacent to abnormal facet
, most commonly L4-L5, and may cause radiculopathy (11, 12). These lesions are typically
round, well-circumscribed, and on CT may demon­
nstrate a cyst wall (12, 13). Increased attenuation
around the rim of the cyst may occur, and may be due to either calcification or hemorrhage
(11, 13, 14). Fluid density material or gas may be seen in the center of the cyst on CT (13–15).
Central signal hyperintensity similar to that of
cerebrospinal fluid may be seen on long TR MR
imaging (11), although central hypointensity can
be seen if the center is fibrous or gas (11, 12).
Histologically, a synovial cyst is a cavity lined by
synovial cells oriented toward the lumen. Uncom­
plicated cysts have only fibrous tissue in the cyst
wall outside of the synovial cells. Sheets of
stromal and giant cells are not found. Fragments
of a synovial cyst thus appear as tissue strips with
cells on one side and acellular fibrous tissue
on the other (16). No such appearance was pres­
ent in this case. The current case of PVNS,
therefore, is distinguished from a synovial cyst by
the radiographic findings of a poorly circum­
scribed soft tissue mass with central increased
attenuation and no evidence of fluid, the surgical
finding of a solid mass, and by the pathologic
finding of a solid sheet of cells, including histio-
cytic and giant cells, and no evidence of a fibrous
synovial-lined cyst wall.

The differential diagnosis of a lateral extradural
soft-tissue mass with increased attenuation on
CT should include PVNS, synovial cyst, as well
as disk fragment and possible tumor. A poorly
circumscribed soft-tissue mass with central in­
creased attenuation lateralized near an eroded
facet joint should strongly suggest PVNS as a
likely diagnosis. MR imaging may then prove
useful in helping to confirm the diagnosis by
identifying central hemosiderin deposition and
lack of cyst fluid.

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