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CT Myelography of Extradural Pigmented Villonodular Synovitis

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Pigmented villonodular synovitis (PVNS) is an uncommon lesion nearly always occurring in the large synovial joints of the extremities. Involvement of the vertebral column is rare, having been previously reported only four times. The present report describes the myelographic and postmyelographic CT appearance of PVNS arising from a lumbosacral facet joint and extending within the spinal canal as an extradural mass.

Case Report

An 81-year-old woman in previously good health gradually developed left buttock and posterior thigh pain over a period of several months. Conservative treatment, including courses of analgesics and bed rest failed to relieve her symptoms. On admission to the hospital the patient was markedly uncomfortable; a straight-leg-raising test was equivocal on the left, and no neurologic deficit was noted. Moderate degenerative changes without bony erosion were noted throughout the lower lumbar spine on initial radiographs.

Owing to the patient's intractable pain, a metrizamide myelogram was performed. This demonstrated an extradural mass along the left posterolateral aspect of the thecal sac extending from the L5-S1 level caudally (Fig. 1). A CT scan done after myelography showed a well-defined soft-tissue density arising at the level of the left L5-S1 facet joint and extending approximately 5 cm caudally. The mass reached a maximal diameter of 2 cm in its midportion, causing a prominent extradural indentation on the thecal sac (Fig. 2).

Although a malignant neoplasm could produce such an extradural defect, the lack of adjacent bony involvement on either radiographs or CT and the lack of clinically evident malignancy (e.g., breast or lung carcinoma, multiple myeloma, or lymphoma) led us to think a benign neoplasm was more likely. Our preoperative diagnosis was therefore neurolemmoma or meningioma.

A decompression laminectomy of L5-S1 was performed. The fusiform-shaped tumor was gray-brown in color and was adhered to a sacral nerve root on the left. The tumor was excised and pathologic examination revealed findings of pigmented villonodular synovitis. The patient had a satisfactory postoperative course with resolution of her pain.

Discussion

Jaffe et al. [1] described pigmented villonodular synovitis (PVNS) in 1941 as part of a group of interrelated lesions of the tendons, bursae, and synovial joints. PVNS is identified histologically when characteristic fronds lined with synovial cells are seen (Fig. 3). There is a cellular stroma of fibroblasts and macrophages, the latter often containing hemosiderin, which accounts for the characteristic pigmentation of PVNS. Giant cells and foam cells are frequent and mitotic figures are occasionally seen. The lesions are benign, but can recur if not completely excised [1-4]. The etiology of PVNS has been the object of considerable investigation, but has not been established. Most authors favor a noninfectious, inflammatory origin.

PVNS is an uncommon lesion that is usually monarticular. It nearly always involves an extremity, with 80% of lesions occurring at the knee. PVNS occurs equally in both sexes, most commonly in young to middle-aged adults. The lesion can be asymptomatic or present with pain, tenderness, swelling, or decreased range of motion of the involved joint. A soft-tissue mass with erosions of the adjacent bone or joint is often seen, especially if the affected joint is other than the knee. Aspiration of the involved joint often yields dark-brown serosanguinous fluid [2-4].

PVNS involving the vertebral column is rare, having been previously reported just four times in the literature. PVNS has only been described in the cervical (two cases) and lumbar (two cases) portions, where it arises from the joints of Luschka and the facet joints, respectively. The lesion can extend into the soft tissues of the adjacent paravertebral area or into the spinal canal as an extradural mass [5-7].

The differential diagnosis of such an extradural mass includes both benign and malignant causes, of which the majority are malignant. Of these, the largest group is composed of metastatic lesions (especially lung or breast carcinoma) of the vertebra with extension into the spinal canal. Similarly,

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vertebral involvement with spinal canal extension is frequently seen in lymphoma and multiple myeloma. Chordomas are a rare cause of extradural compression. Of the benign extradural tumors, neurolemmoma is the most common. Meningioma can also be entirely extradural, and is reportedly more often malignant in this location. Less common benign epidural tumors are lipoma, dermoid and epidermoid neoplasms, and teratoma [8, 9].

Hypertrophic synovitis of the lumbar facet joint associated with herniated intervertebral disk has been reported and included in a recent review of PVNS [3, 10]. Abnormal stress in the facet joint caused by adjacent disk disease resulted in

degenerative changes including hemorrhage, joint capsule thickening, and synovitis. Loculations of villous synovial clefts, hemosiderin, connective tissue, and fibrotic elements within a paraarticular mass were seen in two patients [5]. The absence of giant cells, foam cells, and histiocytes separates such hypertrophic synovitis of osteoarthritis from PVNS [2, 4].

Significantly increased attenuation values have been reported in a PVNS lesion of the knee secondary to the presence of hemosiderin pigment [11]. Beam-hardening artifact and other limitations prevented accurate evaluation of CT numbers within the spinal canal in this case.

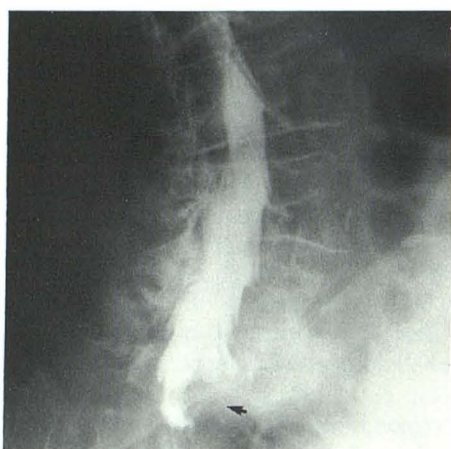


Fig. 1.—Metrizamide myelogram. Left posterolateral extradural defect (arrow) below L5-S1 level.

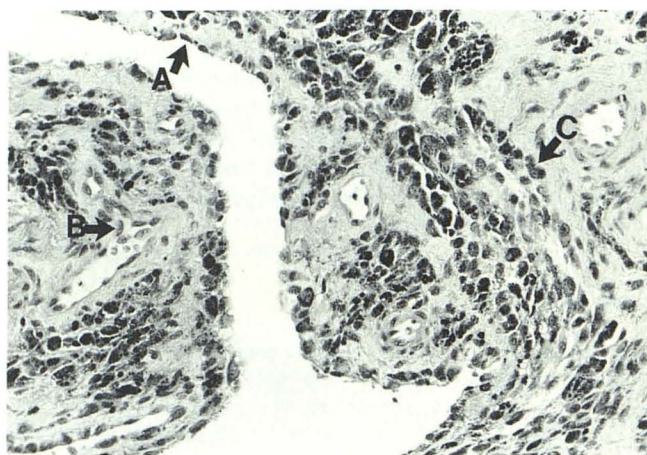


Fig. 3.—High-power (400x) photomicrograph of two adjacent frondlike projections of surgical specimen show characteristic features. A = synovial cells lining projections; B = fibroblasts; C = one of numerous hemosiderin-laden macrophages.

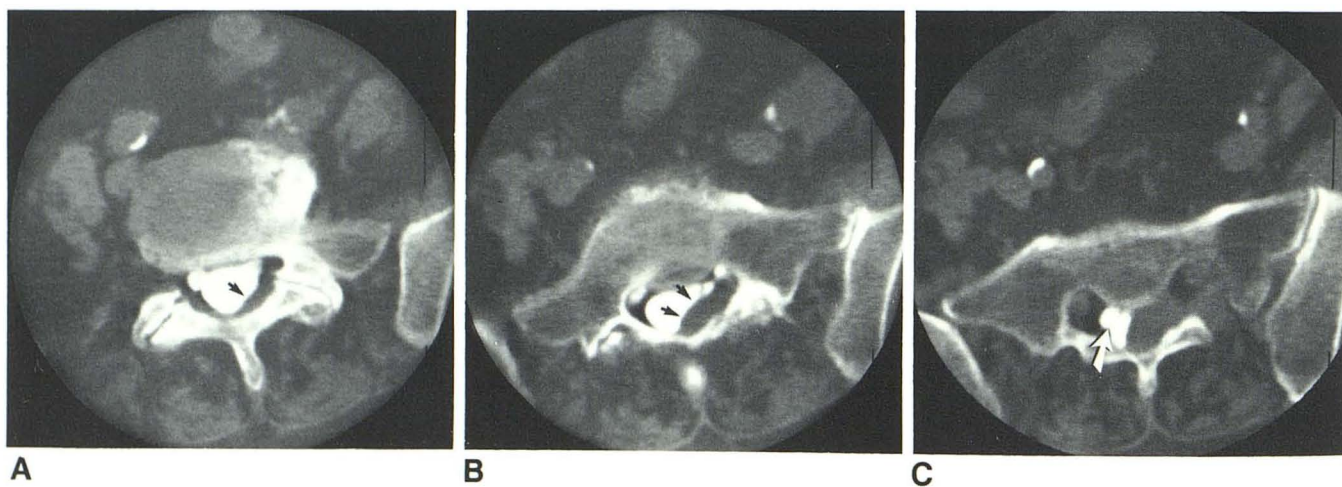


Fig. 2.—Postmetrizamide myelogram CT scan. A, There are prominent degenerative changes at level of L5-S1 facet joints. Note slight extrinsic impression on thecal sac posterolaterally on left (arrow).

B, 1 cm caudad, lower portions of L5-S1 facet joints can still be seen. Extradural mass widens, causing more profound impression on thecal sac (arrows).

C, More caudad, fusiform mass is seen in its widest dimension. Filling of the S2 nerve root sheath is not seen on left but well seen on right (arrow).

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