Tenosynovial giant-cell tumor of the cervical spine

Case report

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A case of tenosynovial giant-cell tumor affecting the cervical spine is reported. The lesion is seen primarily in the fingers, knee, or ankle, and there are no previous reports of it occurring in the spine. The histological and radiological features of this tumor are discussed along with a brief description of the disease entity.

Key Words • tenosynovial tumor • giant-cell tumor • cervical spine

Tenosynovial giant-cell tumor belongs to a group of lesions believed to arise from the synovium of tendon sheaths, bursae, and joints. According to their locations and encapsulation, the following types are recognized: a localized extra-articular type, also known as "nodular tenosynovitis;" a diffuse, nonencapsulated intra-articular type, designated as "pigmented villonodular synovitis;" and a diffuse, extra-articular growth, the giant-cell tumor of the tendon sheath or tenosynovial giant-cell tumor. Whereas nodular tenosynovitis often occurs as well-circumscribed masses near the interphalangeal joints of the hands of middle-aged women, giant-cell tumors of tendon sheaths occur most often as large masses near weight-bearing joints, especially around the knee and ankle, of younger patients. In a few cases, tenosynovial giant-cell tumors have occurred near the hip or sacroiliac joints; however, we are not aware of descriptions of this type of lesions in the vertebral column or associated joints. Recently, we have had the opportunity to study the case of a middle-aged woman with a tenosynovial giant-cell tumor of the cervical spine.

Case Report

This 42-year-old black woman was involved in a motor-vehicle accident on December 10, 1990. During the emergency-room evaluation, cervical spine films showed a lytic lesion affecting the laminae of C-6 and C-7 on the right. At the time of her accident, the patient denied associated neck pain, and her neurological examination was entirely normal. Her medical history was remarkable only for hypertension and for a whiplash injury sustained in a motor-vehicle accident in 1967. She had no neurological deficits. She was referred to the Department of Neurosurgery for evaluation of the incidental bone defect.

Examination. The patient remained completely asymptomatic. Her neurological examination was normal and she had full range of motion of the cervical spine without associated pain. Myelography and postmyelography computerized tomography demonstrated an epidural soft-tissue lesion to the right of the thecal sac at C-6 and C-7. There was partial erosion of the laminae and the facet joint at this level (Fig. 1). Subsequent magnetic resonance imaging showed a destructive enhancing lesion involving the articular facets and laminae of C-6 and C-7 on the right, with minimal intraspinal extension (Fig. 2). Because the imaging studies could not rule out a malignancy, the patient agreed to surgical excision of this lesion.

Operation. A unilateral cervical exposure of the C-6 and C-7 laminae and facets revealed a firm reddish tan lesion eroding through the laminae and facets with extension through the intervertebral foramen. It appeared to have replaced or infiltrated the ligamentum flavum. The eroded bone had smooth contours and was normal in consistency, without visible tumor infiltration. Following a partial laminectomy, the tumor was sharply excised. The ventral and medial margins of the lesion resembled the ligamentum flavum, although its dorsal and lateral portions were grossly abnormal.

Pathological Examination. Microscopically, the lesion was composed of solid cellular sheets, focally in-
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![Image](https://example.com/image.png)

**FIG. 1.** Postmyelography axial computerized tomography scan at two consecutive levels revealing an epidural soft-tissue mass (arrows) to the right of the thecal sac. There is erosion of the right posterior laminae and facet joint with extension of the lesion into the foramen transversarium.

![Image](https://example.com/image.png)

**FIG. 2.** Left: Sagittal T1-weighted magnetic resonance (MR) image (TR 500 msec, TE 20 msec) of the cervical spine demonstrating an isointense lesion (arrow) eroding the posterior elements at C-6 and C-7. Center: Sagittal T1-weighted MR image (TR 2500 msec, TE 90 msec) of the cervical spine showing the same lesion to be inhomogeneous with areas of hyperintensity (arrow). Right: Gadolinium-enhanced sagittal T1-weighted MR image (TR 500 msec, TE 20 msec) showing enhancement of the lesion (arrow).

terrupted by small cleft-like spaces lined by synovial epithelium. The cellular composition of the tumor was polymorphic: small mononuclear cells with well-defined polygonal borders and oval nuclei predominated. Some of these cells contained hemosiderin pigment within their cytoplasm. There were also frequent multinucleated giant cells, spindle cells, and some lymphocytes and plasma cells (Fig. 3). The small cleft-like spaces were lined by cuboidal synovial cells. Sheets of plump foamy xanthomatosus cells were also present.

Immunohistochemically, the majority of the mononuclear and multinucleated cells reacted for vimentin, a generic marker for mesenchymal cells. Immunostains for keratin and leukocyte common antigen and markers for epithelial and lymphoid differentiation were negative.

**Postoperative Course.** After surgery the patient was neurologically intact. She made an uneventful recovery.

**Discussion**

Villonodular synovitis, nodular tenosynovitis, and giant-cell tumor of the tendon sheath are related lesions with a common histological picture. Microscopically, they consist of a proliferation of synovial and subsynovial cells, histiocytes with hemosiderin-laden or foamy cytoplasm, benign multinucleated giant cells, and mononuclear inflammatory cells. Pigmented villonodular synovitis is a rather common lesion most frequently affecting the knee and hip joints; it consists of a florid, villous, and usually heavily pigmented synovial overgrowth that may cover the entire surface of the joint. The main difference between pigmented

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villonodular synovitis and giant-cell tumor of the tendon sheath is that the former is mainly an intra-articular growth, whereas the latter grows predominantly outside the joint. In our case the lesion was largely extra-articular and is therefore described as a giant-cell tumor of the tendon sheath. As discussed by Enzinger and Weiss, the exact site of origin of these lesions is often hard to define. In our case, the lesion most likely arose from the synovium of the facet joint but grew mainly extra-articularly rather than in the interior of the joint space.

Typical symptoms associated with these lesions include pain, swelling, and limitation of motion, which may be confused with those of rheumatic or infectious arthritis. Symptoms may be mild, transient, and present for a long time before the patient seeks medical attention. However, patients may be completely asymptomatic, as was true in our case. Plain radiographs show bone erosion, joint-space narrowing, and subchondral cysts. The lesion is isointense on T1-weighted MR imaging and shows an inhomogeneous signal on T2-weighted images, with areas of hypo- and hyperintensity. The MR studies in our case were consistent with this description, showing inosintensity on T1-weighted images and an inhomogeneous signal on T2-weighted images. However, this MR appearance is by no means diagnostic of tenosynovial giant-cell tumors and similar pictures can be seen with metastasis, myeloma, plasmacytoma, and lymphoma.

The etiology of both giant-cell tumor of tendon sheath and villonodular synovitis is unknown. It is not entirely clear whether these conditions are basically inflammatory or neoplastic. A history of antecedent trauma can frequently be elicited, favoring an inflammatory nature. Similar lesions can be produced experimentally by intra-articular injection of blood or can be observed in joints of hemophilic patients with repeated episodes of intra-articular bleeding. On the other hand, a neoplastic origin is supported by the fact that no etiological agents have been recovered by microbiological studies, and by the high rate of local recurrence after resection of the lesions. In fact, 40% to 50% of patients with tenosynovial giant-cell tumor and 46% of patients with pigmented nodular synovitis experience local recurrence after excision. The treatment is mainly surgical excision. Irradiation of the joints has been advocated as adjuvant therapy although its role in the management of these disorders remains unclear.

Our case represents a previously unreported instance of giant-cell tumor of tendon sheath of the cervical spine. It is important to be aware that this lesion may involve the vertebral axis, since its clinical and radiological features may mimic those of numerous other neoplastic and non-neoplastic conditions of this region.

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