Lumbar Intraspinal Extradural Ganglion Cyst*

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Ganglion cysts are commonly found about the wrist and hand. 1-6 Theoretically, they can occur at any site in the body where periarticular connective tissue is present. Reports by others have indicated common involvement of various joint regions such as the shoulder, elbow, hip,9,10 knee,2,5 ankle,2 and axilla.6 These cysts may cause pressure on adjacent peripheral nerves to produce a variety of neurological symptoms.2,5,6

Recently, two patients consulted us for symptoms suggesting a protruded lumbar intervertebral disc; in each an extradural ganglion cyst was uncovered and removed at operation. Subsequently, an asymptomatic ganglion cyst was found in a third patient.

Case Reports

Case 1. A 52-year-old white woman came to the Mayo Clinic because of pain in her right leg. She had had intermittent low back pain for 10 years, which was initiated by prolonged standing and relieved by lying down. Approximately 3 years before we saw her, she began to have pain radiating into the right leg along the posterior aspect. In the past year, there had been a constant pain in the right buttck, which radiated to the posterior lateral part of the thigh, anterior lateral part of the leg and ankle, and at times to the right big toe. Rest now apparently afforded little relief. On one occasion the patient was awakened at 4 a.m. with excruciating pain in the right buttck. Coughing and sneezing would cause sharp pain down the right leg, and occasional tingling was noted in the right great toe. The patient was never aware of any weakness in the right leg.

Examination. The general physical examination and laboratory studies gave normal results. The thoracic x-ray was clear. The sedimentation rate was 15 mm in 1 hour (Westergren). There was considerable limitation of motion of the lumbar part of the spinal column, with paravertebral muscle spasm on the right. The straight-leg-raising test produced low back pain at 80° with the right leg but no pain up to 90° with the left. The chin-chest test was positive. Tenderness was noted in the right sciatic notch. The right ankle jerk was slightly diminished but there was no motor or sensory deficit on neurological examination. X-rays of the lumbar spinal column revealed some degenerative joint changes at several levels, associated with a minimal degree of scoliosis with the convexity toward the left side.

A myelogram (Pantopaque) showed a large, spherical, extradural deformity at the L4-5 level on the right side, suggesting the possibility of a tumor rather than a protruded intervertebral disc (Fig. 1). Spinal fluid pressure was 170 mm H.O with no block; the concentration of protein was 37 mg/100 ml, and there were 2 lymphocytes/1 cu mm of fluid.

Operation. Right partial hemilaminectomy at L-4 was performed, and an extradural, cystic mass about 1 cm in diameter was encountered, arising under the pedicle between L-4 and L-5. The ligamentum flavum was adherent to the mass which in turn was pushing the common dural sac and nerve root toward the midline. On further dissection, the cyst ruptured and a yellow gelatinous fluid gushed into the operative field. The cyst including its wall was completely removed, and the base along the pedicle was electrocoagulated. The pedicle was not disturbed. The intervertebral disc was explored and found to be normal. The wound was closed in the usual manner after placement of a silver clip for x-ray identification. The excised cyst exhibited a dense, fibrous wall (Fig. 2).

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Postoperative course. The postoperative course was uneventful. The patient obtained complete relief of pain and was dismissed from the hospital on the ninth postoperative day. She was able to participate in sports without discomfort 3 weeks after dismissal.

Case 2. This patient was 45 years old when he first was seen at the Mayo Clinic in August, 1950. In 1943 while engaged in the sport of curling he had had two episodes of "catches in the back" which lasted several hours. In 1944 he had severe low-back pain after reaching for a shot while playing squash. He had been unable to work for 3 weeks but recovered on a regimen of bed rest, hot packs, and a firm bed. In May, 1950, he was awakened during the night by a low lumbar backache; there was no radiation into the leg. The next day his temperature was 103°F (by mouth). A cough or sneeze did not intensify the back pain.

First examination. X-rays of the lumbar spine showed increased bone density and roughening of the articular facets, thought to be a result of rheumatoid spondylitis. A myelogram (Pantopaque) in August, 1950, revealed a normal subarachnoid space. The spinal fluid protein content was 15 mg/100 ml with 1 lymphocyte/1 cu mm. The blood sedimentation rate was 13 mm in 1 hour (Westergren). The patient was discharged after a short hospitalization (5 days) and had been in good health with no complaints of backache.

Readmission. When the patient returned to this clinic in June, 1966 (now 62 years
old), he reported a spontaneous gradual onset of persistent severe pain in the left buttock, knee, and anterior upper part of the leg of 2 weeks' duration. At this time, cough or sneeze had no effect. The pain became worse when he walked, sat, or lay on his back. He could not lie comfortably on his left side. However, he had obtained some relief by assuming the right knee-chest position and wearing a back support. Night pain had been frequent. On examination, he appeared to be well developed and well nourished but in acute distress. He preferred to be in bed because of tenderness in the left buttock on palpation and inability to lie on the left side without increasing the distress.

Second examination. There was a general hyporeflexia and a definite weakness of the left hamstring and quadiceps muscles, which seemed to be greater than could be accounted for on the basis of pain alone. There was also a sensory change of the left leg compatible with L-5 root distribution. On the straight-leg-raising test, elevation to $90^\circ$ was possible bilaterally, although it did produce more pain on the left side. X-rays of the lumbar spine again disclosed degenerative changes of several lumbar facets with additional narrowing of the lumbosacral interspace. A myelogram revealed a large, extradural defect at L4–5. The deformity was bilateral but more marked on the left (Fig. 3). The spinal fluid protein concentration was 46 mg/100 ml, and there was 1 lymphocyte/1 cu mm of fluid.

Operation. Minimal left L-4 hemilaminectomy was carried out. When the ligamentum flavum was removed, a bony excrescence was noted at the facet junction of L-4 and L-5, overlying the L-5 root. When this excrescence was removed, a cystic mass measuring $11 \times 7$ mm was seen extradurally; it was directly compressing the L-5 nerve root as it entered the nerve root foramen proximal to the nerve root ganglion. Both the osseous lesion and the cystic mass were removed. The cyst had a central cavity 3 mm in diameter and a fibrous wall 4 mm in thickness. The gelatinous material in the cyst was considered classic for a ganglion cyst. The intervertebral disc was explored and, because it appeared to be normal, was not removed.

Postoperative course. When the patient was dismissed from the hospital on the seventh postoperative day, he stated that he was experiencing only minimal pain. At a follow-up examination 2 months later, the patient was symptom-free, and he has remained in excellent health with return of his muscle strength and sensation to normal.

Case 3. A 36-year-old housewife had an asymptomatic ganglion cyst arising on the left side from the facet joint at L4–5, which was found during lumbar disc removal and posterior fusion. This ganglion cyst protruded dorsally into the paraspinal musculature rather than anteriorly against the nerve root and common dural sac. There was gelatinous material in the cyst. It measured 5 mm in diameter and was attached to the facets but had no detectable communication with the joint cavity.

Discussion

Apparently, paraspinal ganglion cysts that grow dorsally and remain asymptomatic are relatively common. However, ganglion cysts that grow to a sufficient size to extend into the nerve root foramen or intraspinal canal and produce signs and symptoms of an extradural space-occupying lesion
compressing the common dural sac and the nerve roots in the adjacent area (Fig. 4) are rare. Laminography may reveal areas of circumscribed bony erosion with changes in the adjacent vertebral pedicle, as was subsequently noted in Case 1. This x-ray finding has been noted by others.²,⁶

In the three cases reported here, ganglion cysts arose in the periartricular joint tissues between L-4 and L-5. This is of considerable interest because the greatest range of movement in the lumbar region occurs between these vertebrae.¹¹ The bursae around the lumbar synovial joints have been described.¹¹ Whether the ganglia at this site arise as a result of herniation of the synovial membrane through tears in the ligamentum flavum or as a result of myxomatous or cystic degeneration of the connective tissues adjacent to a synovial joint is disputed. Trauma is not considered responsible for the development of ganglion cysts.¹

The clinical and x-ray differential diagnosis of extradural intraspinous cystic mass lesions is difficult.⁶,¹¹,¹³ The findings on plain x-rays have been emphasized again by Krumbholz and his associates¹² in a recent review. Apart from protruded intervertebral discs and the primary or metastatic tumors that occur in this region, one should consider also extradural arachnoidal cyst,³ sacral nerve root cyst of Tarlov,¹⁷ dermoid cyst, and neurofibroma with cystic change.

Microscopically, the ganglion cyst should have no synovial lining membrane and no communication with the joint cavity.³ This differentiates it from the true synovial cyst. The connective tissue investment of a ganglion cyst may undergo repeated inflammatory change and become thickened. The presence of nerve in the cystic cavity or cyst wall should suggest a Tarlov cyst or a neurofibroma with cystic change which may include an extension from the subdural or subarachnoid spaces.

The microscopic picture of an extradural arachnoid cyst may be practically identical to that of a ganglion cyst. However, arachnoid cysts occur predominantly in younger persons and are located primarily in the thoracic part of the spinal column in association with kyphosis.⁴ In a review of 61 cases of spinal extradural arachnoidal cysts, Gortvai¹ found a communication of the cyst cavity with the subarachnoid space in 26 cases; this communication may or may not be demonstrated by myelography. It should be mentioned that the arachnoid cyst contains clear or xanthochromic fluid rather than gelatinous material. Reevaluation of the 61 cases reviewed by Gortvai disclosed that none resembled a ganglion cyst.
Our three cases exhibited cystic lesions that were filled with a gelatinous material and had a wall of moderately dense fibrous tissue with no evidence of a synovial lining. Flecks of calcium were noted in the wall of the cysts removed in Cases 1 and 2. The third cyst showed no calcium in its wall, and the fibrous tissue had a loose arrangement with a myxoid-appearing ground substance. The calcium deposits are believed to be secondary to degenerative changes in the periarticular tissues, a factor that may be germane to the formation of the cysts.

Summary

Two cases of lumbar intraspinal extradural ganglion cyst have been reported in which the clinical picture simulated that of a protruded lumbar intervertebral disc. In a third patient, a similar lesion posteriorly located was discovered as an incidental finding at operation. Patients with these lesions intraspinally usually have a history of back and leg pain of long duration with a considerable degree of pain at night. Degenerative arthritic changes have been observed in the related lumbar synovial joints and bony excrescences as well as bony erosion may be found. The pathogenesis and differential diagnosis of masses in these areas have been discussed. In no instance was there associated disease of an intervertebral disc.

Pantopaque myelography will disclose an extradural defect but the nature of the defect can be determined only at operation. The treatment of choice is excision of the ganglion cyst and its contents as well as any bony excrescences.

References


