Case Reports and Technical Note

Intraspinal Teratoma Simulating Protruded Intervertebral Disc

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Intraspinal teratomas are exceedingly rare tumors. In 1949 Sachs and Horrax\textsuperscript{12} tabulated 25 cases of teratoid tumors and teratomas in this location. However, only 10 of these were true trigeminal teratomas. Since then some 5 more cases of true teratomas of this region have been reported,\textsuperscript{5,6,11,12,14} bringing the total to about 15. In 4 instances the lesion has been in the conus medullaris, or attached to it.\textsuperscript{4,13,4,14} This case is reported because of the apparent rarity of such tumors and because of its unusual clinical presentation.

Case Report

J.L., a 47-year-old white male, was admitted to the Montreal Neurological Institute on April 25, 1963, complaining of low-back pain of 2 years' duration. This pain, which was a continuous dull ache in the midline lower lumbar region, had begun gradually with progressive increase in severity, necessitating admission to hospital. The pain was somewhat relieved by rest in bed, but would often bother him at night, especially when he moved around in bed. It was also aggravated by lifting heavy objects in the course of his work as a merchant.

About a year before admission, he began to notice a burning sensation in the lateral plantar aspect of his right foot. This was continuous, but became more intense at the end of the day. There was also a sensation of soreness and burning in the back of the right thigh which he sat down. Five months later, subsequent to a marked increase in the pain in his back, he began to have shooting pains radiating from his back into the right lateral thigh. The pains in the back and leg increased on sitting, and were exacerbated acutely by coughing, sneezing and straining at stool. A few weeks before admission he began to have difficulty initiating micturition, and had frequent low-pressure voiding. Constipation had been a problem for many years. He did not complain of any weakness of the legs. There was a 7-year history of untreated hypertension and diabetes mellitus. He had been impotent for several years.

Examination. He was an obese, fully ambulatory, white male, weighing 200 lbs. Blood pressure was 124/126 (recumbent) and pulse rate, 106. Respirations were 21 per min. and temperature was 99.3\degree F. orally.

There was slight scoliosis of the lower lumbar spine to the right. Tenderness could be elicited by percussion of the back over the spinous processes of L5 and S1. Forward flexion of the trunk to 45\degree caused exacerbation of severe pain in the lower back. Straight leg raising was 90\degree on the left and 60\degree on the right. Compression of the neck produced pain in the right ankle and calf.

There was no tenderness of the muscles, but a moderate weakness of the hamstring muscles and of plantar flexion of the ankle was demonstrated on the right side. He walked with a limp on the right leg. Walking on the heels was good, but he could not support the weight of his body on the right when asked to walk on the tips of his toes. There was hypalgesia on the lateral plantar aspect of the right foot. The right ankle jerk was absent, while all other deep tendon reflexes were normal. Both plantar responses were flexor. The anal sphincter was lax. The prostate was slightly enlarged, but of normal consistency.

Clinical impression: root compression, probably resulting from L4-S1 discal protrusion; obesity, and hypertension.

Laboratory Findings. Aside from a slightly elevated rate of sedimentation, the routine hematological and electrolytic findings were normal. Urinalysis, however, disclosed 3+ glycosuria, 1+ albuminuria, and occasional hyaline and granular casts. The fasting blood sugar was 226 mg. per cent and the glucose tolerance curve was typical for diabetes. The serum uric acid and blood-urea nitrogen levels were normal.

Roentgenogram of the lumbarosacral region disclosed bony anomalies in the neural arches from L4 to S2 inclusive. The neural arches of L4 and L5 were incomplete posteriorly, with a long spinous process projecting downwards from the right side of the incompleat neural arch of L4. The posterior arches of S1 and S2 were also incomplete. In addition, there was narrowing of the discal spaces between L4 to L5 and L5 to S1. The interpedicular distances from L1 to S2 were at the upper limits of normal, but there was no localized widening of the vertebral canal at any level, nor was there any scalloping of the posterior surface of the vertebral bodies. A roentgenogram of the chest was normal.

At myelography clear fluid was obtained from the subarachnoid space; Pandy 3+; protein 420 mg. per cent. Only a small amount of contrast medium was introduced into the subarachnoid space, however, because during the injection the patient experienced excruciating pain in the right leg. The contrast material moved down from L3 to S2, but would not move higher. At the L5 level, the opaque medium outlined the inferior pole of an intradural lesion, around which the nerve roots appeared to be stretched. The radiological impression was that of an intradural tumor, with its caudal portion at the L3 level.

Preoperative Course. He was put on insulin and a diabetic diet, and during the 8-day interval before operation, he continued to complain of pain in the back which was not relieved by mild analgesics. When his diabetes was controlled, laminectomy was carried out.

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Operation. On May 8, 1963, under endotracheal anesthesia, the patient was postured prone with the table flexed in the midlumbar region, and a bilateral laminectomy was performed at the L2 level, with partial laminectomies of L1 and L3. The extradural tissues were normal, but through the dura mater, which was slightly expanded at the L2 level, one could see and palpate a mass. The dura mater was opened, and a knob of yellow somewhat translucent tissue was seen on the dorsal surface of an unusually low conus medullaris (Fig. 1). The tumor was 2 cm. long and 1 cm. across. The plane of cleavage between this and the cord was poorly defined, and the tumor appeared to have arisen from the cord itself. When this portion had been removed, a large cyst, measuring 2 cm. in length, was seen lying within the cord at the ventral aspect of the site of removal. Four cc. of thick, dark brown, shimmering fluid were aspirated from this cyst.

When opened, the greenish-brown lining of the cyst was exposed. This cyst was teared away from the surrounding cord easily, and it was removed in toto. Finally a small remaining portion of tumor close to the filum terminale was also removed. At the site of removal, the walls of the spinal cord appeared thinned out to no more than 1 mm., but the posterior roots could be seen affixed to this thin rim of cord.

Postoperative Course. The patient did well, and his vital signs remained stable. There was some difficulty in voiding during the first 2 postoperative days, and he had to be catheterized on two occasions. Pain in the back was markedly reduced, and he complained only of some minor pain in the outer aspect of the right thigh. Control of his diabetes remained a problem, and he had several reactions to insulin. Four days postoperatively he could walk slowly, with slight discomfort in his right leg. On the 11th day, 2 days after complete removal of sutures, a part of his operative incision dehisced, requiring two sutures. Within a few days, there was complete healing. He was then transferred to the metabolic unit for diabetic instruction, whence he was discharged home on May 25, 1962.

Seven weeks after operation the patient was reexamined. He had been back at work for 2 weeks, unpacking heavy cases of groceries. There was a residual mild backache on bending forward. The burning sensation in his right foot had disappeared, leaving a peculiar sensation of swelling across the sole of this foot, especially after walking for a long time. The pressure of his urinary stream had improved, and there were no other complaints referable to the urinary system.

Bending forward with his legs straight he was now able to reach to 15 inches from the floor. The right hamstring muscles now had normal strength, but there was still some weakness of planter flexion of the right foot. There was still some decreased perception of pinprick on the lateral border of the right foot. The right ankle jerk remained absent.

At present, 8½ months postoperatively, his diabetes is well controlled. He still complains of impotence, but there are no other subjective complaints.

Gross Pathology. Part of the surgical specimen consisted of several pieces of unencapsulated firm, yellow-grey tissue, the largest of which measured 1 X 0.5 cm. One small float in the fixative and appeared to be fat. On section of the largest piece, the cut surface was a homogeneous yellow-grey color, with numerous small cystic areas.

The cyst measured 2 cm. in its widest diameter, and its wall was 0.4 cm. in thickness. The outer wall was composed of firm, yellow-brown tissue, while the lining membrane was glistening grey-brown, with four small brown excrescences projecting into the lumen.

Microscopic Examination. One solid portion of the tumor resembled tissue of salivary gland (Fig. 2) since there were acini containing cells of both serous and mucous type, together with their accompanying excretory ducts. Some of the cuboidal acinar cells contained mucin, while others contained glycogen.

Other parts consisted of fat of adult type, containing corpuscles of Vater-Pacini (Fig. 3) and small bundles of myelinated nerves of the peripheral type.

In one part there were tubular structures of varying sizes lined with transitional to columnar epithelium. The transitional lining of the largest of these structures was separated from a layer of smooth muscle (Fig. 4) by a thin lamina of connective tissue (Fig. 5). The wall thus resembled that of urinary bladder.

The intramedullary cyst was lined with typical stratified squamous epithelium (Fig. 6) resting on a dense mantle of collagenous tissue. At intervals the lining was interrupted by nodular thickenings composed of dense collagen, containing clefts of cholesterol and infiltrated with foam cells. The fluid aspirated from the cyst contained cholesterol crystals.

Diagnosis. The tumor contained components derived from all three germinal layers, and we believe this is a true teratoma of the conus medullaris.

Comment

The presentation of this mainly intramedullary tumor as a protruded intervertebral disc is of interest. From the steady progression of the patient’s symptoms, it follows that the tumor was gradually expanding. At operation the posterior nerve roots of the cauda equina were taut over the bulk of the tumor. Thus the symptoms of protruded intervertebral disc were caused by irritation and stretching of the nerve roots, as in a truly protruded disc. Burning sensations in the