Case Reports and Technical Notes

Chondroma of the Cervical Spine

Case Report

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CHONDROMAS of the vertebral column are exceptionally rare. We are reporting a case in which total removal of the tumor was accomplished.

Case Report

A 10-year-old girl was admitted to the clinic on December 8, 1964, because of progressive weakness of the legs. In July, 1964, she had fallen from a tree landing on her back. Some hours later she was able to walk again, but after a few days she started limping on her right foot. By October, she had begun to drag first her right then her left leg; a month later her gait was so impaired that she stopped walking.

Examination. There were no general physical abnormalities except that flexion of the head was restricted. The left biceps reflex was somewhat more active than the right, and the abdominal reflexes were weak, particularly on the left. The legs were in an extended position, displaying muscular rigidity and severe paresis, most marked on the right. Patellar reflexes could be elicited bilaterally. Superficial and deep sensibility were normal except for an inconstant, diminished perception of pain and temperature over the trunk, below the D-6 level. The Queckenstedt's test showed a spinal block; the cerebrospinal fluid was clear, with normal cells and a protein content of 330 mg%.

When examined by the Department of Neurosurgery on December 14, the patient showed a progressive spastic paresis of the legs with no impairment of sensibility or sphincters. Radiographic examination of the vertebral column demonstrated the following abnormalities: the left intervertebral foramen at C6-C7 was considerably enlarged; the left lamina at C-6 was thinned and elongated.

The posterolateral part of the C-6 vertebral body was comprised by an enlargement of the intervertebral space. The vertebral body at C-7 was intact but showed signs of reorganization and sclerosis; the intervertebral discs in this region were normal. There was destruction of the left transverse process as well as the left C-7 lamina. The radiological picture indicated a destructive growth occupying the intervertebral foramen of C6-C7 and expanding mainly laterally and posteriorly as a dumbbell-shaped tumor. The irregular, cloudy calcification in the region of the transverse process and C-7 arch suggested the malignant nature of the tumor (Fig. 1).

Operation. Exposure of the lower cervical spine on December 29 disclosed a tumor occupying the position of the C6-C7 spinous process, and the left transverse process. The grayish tumor was smooth-surfaced and encapsulated; in some parts it was very soft, in others, more compact and enclosed softened fragments of the vertebrae. It had invaded the spinal canal from its posterior and lateral left side, producing a marked compression.

![Fig. 1. X-rays of cervical spine, anteroposterior and lateral views, showing destructive growth in the intervertebral foramen of C6–7 with cloudy calcification suggesting a malignant tumor.]
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and dislocation of the dural sac. There was no infiltration of the dura, however, and it could be easily separated. The left transverse processes of the C-6 and C-7 vertebrae showed neoplastic destruction. The tumor was removed totally. The large residual cavity communicated widely with the spinal canal due to the defect produced in its lateral wall. The vertebral bodies of C-6 and C-7, as well as the arch and the spinous process of C-5, showed signs of tumor compression. The left C-6, C-7, and C-8 roots, although displaced by the tumor towards the vertebral bodies, ran in the bottom of the canal and were completely intact. There was no need to open the dural sac, as it appeared normal in shape and pulsated freely. Spinous processes at C-4 and C-5 were connected with that of T-1 by steel wire (Fig. 2).

**Microscopic Examination.** The tumor showed cartilaginous cells, single or in groups. The large cells were oval, with abundant, pale protoplasm and a centrally placed nucleus. The intercellular substance stained pale pink. There were some small foci of calcification. No mitoses were present. The histopathological diagnosis was chondroma (Fig. 3).

**Postoperative Course.** There was a rapid improvement in the paralyzed legs so that, within a fortnight, the patient started to walk. When discharged on January 26, 1965, the patient showed only slight restriction of head movements, a slight flaccid paresis of her left arm, and some spasticity in her gait. When examined 5 months later, the strength of both legs had returned to normal, the gait was normal, and the reflexes in the legs were brisk but equal.

At 1½ years after operation, while performing exercises, the patient felt a sudden pain in the cervical spine. X-ray examination revealed disruption of the wire (Fig. 4), which was apparently caused by the strenuous exercises. No treatment was applied, and the patient was told to avoid hard physical strains. When examined ½ year after this episode, motor capacity and gait were normal. The right biceps reflex, however, was somewhat depressed, and the right knee and ankle jerks were more brisk than those on the left. At the last follow-up 3½ years after operation, the patient was in excellent health.

**Discussion**

Chondroma, a benign neoplasm, occurs rarely, constituting about 5% of all bone tumors. Built of mature, cartilaginous tissue, it develops into tumors of various size, generally soft or elastic in consistency, smooth surfaced, and rather sharply delimited from surrounding tissue. It grows slowly and is rarely multiple in number. It is found equally in both sexes and at all ages of life, but is most common in the age group of 30 to 40 years. Its varied location is determined by developmental disorders, the small bones of hand and foot being most frequently af-

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Fig. 2. X-rays immediately after operation showing connection of spinous processes at C-4 and C-5 to that of T-1 by steel wire.
Chondromas of the spine are extremely rare, amounting to approximately 4% of all the chondromas and 2% of all spinal tumors. They grow in the cervical or cervicothoracic part of the vertebral column and are found most often in the lumbar region. Only one case of chondroma has been encountered among 200 cases of intravertebral tumor observed at the Warsaw Clinic of Neurosurgery. In similar reports, the authors either mention single cases of chondroma, or they do not mention them at all.

There are two concepts concerning the pathogenesis of chondromas of the vertebral column; one relates to true cartilaginous metaplasia of the fibrous connective tissue, the other, to a pathological hyperplasia of premature cartilage that split away during embryonal development. There is, however, a generally accepted division of spinal chondromas into two groups, namely, the more frequently encountered group that originates from cartilaginous elements of the vertebral body, and the rarer group developing from the anulus fibrosus of the intervertebral disc or the dura.

Our case probably belongs in the first group, as the intervertebral discs were preserved and the tumor loosely connected with the dura. The striking development of a rapidly progressing spinal cord compression 3 months after a severe blow of the vertebral column suggests the possible significance of trauma.
Total extirpation of a chondroma of the vertebral column is rarely possible. In our case, however, the conditions were such that a total removal of the tumor was possible. In spite of complete regression of neurological deficits, the prognosis remains uncertain, since chondromas of the vertebral column, as well as those of the long bones, are potentially malignant.

References