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Osteochondroma of the Vertebra

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A seldom considered manifestation of multiple hereditary exostosis — vertebral lesions with and without neurological complications — is discussed. Three additional cases are added to the sparse literature on the subject with hope that the spinal osteochondroma will be searched for and treated before neurological complications become manifest.

Reports of osteochondromata of vertebrae are rare in medical literature. Of those reported, one involving the odontoid process resulted in death of the patient, while others have resulted in varied neurological deficits. Rangachari and Rosaiah described a lesion, of three years duration, at the tip of the sixth cervical spinous process, which was successfully removed without complication and which measured approximately 3 x 4 centimeters in size. Rose and Fekete reported sudden death caused by an osteochondroma of the odontoid process which measured 2.4 x 3.1 centimeters at post-mortem. It impinged upon the spinal cord in the foramen magnum.

Gokay and Bucy reported an osteochondroma of the lumbar spine in a twenty-four-year-old woman. There were signs of nerve root and cauda equina compression between the third and fourth lumbar vertebrae from an osteochondroma. This arose in the region of the intervertebral foramen and transverse process and extended 7.5 centimeters lateral to the spinous process. This tumor was successfully resected in a two-stage procedure resulting in partial recovery of the neurological defect. There was no evidence of recurrence four years after operation.

Bradford describes two osteochondromata arising from the posterior aspect of the body of the eighth thoracic vertebra in one patient, and from the body of the ninth thoracic vertebra in another. Both entered the hospital with serious neurological deficits and, after difficult operative procedures to remove the lesions, both had the even more complete neurological deficit of paraplegia. Due to their anatomical location, these small lesions did a great deal of damage to the cord. Neither of these people suffered from multiple hereditary exostoses.

Ilegenfritz reports an osteochondroma measuring 12 x 5 x 6.5 centimeters arising from the ventral surface over the left transverse process of the seventh cervical vertebra. A mass, originally thought to be a goiter at the base of the neck on the left

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side, had produced Horner's syndrome, dysarthria, and unsteadiness of gait. Successful removal brought marked improvement of symptoms. The mass's presence at the thoracic outlet had interfered with blood flow to the brain and left arm.

In a definitive article on hereditary multiple exostoses (1943), Jaffe states that the ratio of affected males to females is 7 to 3 and that the manifestations of the disease are rarely present at birth. The disease rarely comes to light before two years of age. Approximately half of the offspring, in families in which one parent has multiple exostoses will develop exostoses. Families with the greatest numbers of exostoses tend to produce more numerous lesions in their offspring, and the number of exostoses tends to increase from generation to generation. In about one of every four females who transmit the disorder to their children the mother is an unaffected carrier. The proportion of children affected is just as great when the mother is unaffected as when the mother is affected by the disease. Hereditary transmission of the disease has not been described in cases of solitary exostoses. Jaffe states that few osteocartilaginous exostoses appear in the vertebral column.

Case Presentations

Three new cases of osteochondroma of the vertebra are reported here: 1) The first patient, W.B., was seven years of age when first observed and was found normal on repeated examination until 12 years of age in 1957. At that time a lesion was found over the spinous process of the fourth lumbar vertebra which was diagnosed by x-ray as osteochondroma (Fig. 1). No neurological signs or symptoms developed during the two-year interval between the initial examination and the finding of the lesion. The lesion was located on the left side of the vertebral column, not far from the midline. There was no neurological deficit. The lesion was removed by laminectomy. The patient made an uneventful recovery except for a temporary restriction of arm movement on the left side.

2) The second patient, J.S., was seen in the clinic at the age of three years and was noted to have a growth which interfered with the motion of the right shoulder. It was nonpainful. The mass was excised by laminectomy. The lesion appeared to be a subchondral bone and cartilage which extended from the spinous process of the vertebra to the lateral portion of the body of the vertebra. The patient had no neurological deficit. The mass was found at the junction of the spinous process and the lamina of the vertebra. The patient had an uneventful recovery. The patient was reexamined a year later and found to have a normal shoulder.

3) The third patient, O.D., was seen in the clinic at the age of five years and was found to have a growth causing right shoulder pain and limitation of motion. There was no neurological deficit. The mass was excised by laminectomy. The growth was found to be a subchondral bone and cartilage which extended from the spinous process to the lateral portion of the vertebral body. The patient had an uneventful recovery. The patient was reexamined a year later and found to have a normal shoulder.

L2, L3, and L4 were involved in the growths, and there was no neurological deficit. The growths were excised by laminectomy. The growths were found to be subchondral bone and cartilage which extended from the spinous process to the lateral portion of the vertebral body. The patient had an uneventful recovery. The patient was reexamined a year later and found to have a normal shoulder.
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during subsequent yearly observations but x-ray examinations demonstrated gradual enlargement and calcification. The iliac apophysis closed between 1961 and 1962. There was no further tumor mass enlargement in x-rays in 1965 and 1966 (Fig. 2). The size of the mass demanded surgical removal because the patient was inconvenienced both by its appearance and by its presence when he attempted to sit against a hard-back chair or lie on a hard surface.

At 20 years of age, in April 1966, the patient was admitted to the hospital for surgery. Because he had lived in foster homes since age two, he did not know the family medical history regarding the incidence of possible similar bony lesions. Past medical history revealed no other complaints. He had no symptoms of girdle pain or discomfort in either leg or buttock.

The patient was ambulatory with a normal gait and had no limitation of back motion. Physical examination was within normal limits except for the back lesion which on palpation was an irregular bony mass measuring 8 x 10 x 5 centimeters. It was fixed, smooth, and non-tender, extended over the right lumbosacral region and across the midline to the left side.

By x-ray the large osteocartilaginous lesion arising from the spinous process of the fourth lumbar vertebra was shown to be 11.5 x 7.5 centimeters in size.

Laminography revealed that contact of the tumor with the fourth lumbar vertebra caused increased sclerosis of the laminal surface but the tumor did not appear to extend into the spinal canal. On myelography radio-opaque media flowed freely in the subarachnoid space. There was 25 mgm per cent of protein, two red cells and eleven white cells per cubic millimeter in the spinal fluid.

On April 20, 1966 a midline incision was made over the spinous processes of L2, 3, and 4. The sacrospinalis muscles were interrupted by the tumor on the right and vessels entered the tumor both distally and proximally through this muscle mass. The spinous processes of L5 and L2 were removed by a rongeur. Access was gained to the L3 and L4 spinous processes and these were cut with a curved bone cutting shears. The neural canal was not entered during dissection of the soft or bony parts. The large gap created by removal of the tumor was closed with adjacent tissues and the lumbo-dorsal fascia was sutured over the defect. No blood replacement was needed. (See Fig. 3).

The pathology reported the tumor to be a well differentiated osteochondroma, of the fourth lumbar vertebra (Fig. 4). Post-operative course was uneventful and to date there is no evidence of recurrence.

2) The second case is a girl, C.M., born in 1955 and hospitalized in 1967 with complaints of pain in the right knee present for four weeks.

Physical examination revealed a mild lumbar scoliosis. The heel cords were tight. On neurological examination the cranial nerves were intact but the Romberg
test was positive and the child stood with a wide stance. She was not able to
pronate or supinate her hands rapidly and Hoffman's sign was present on the left.
Thenar and hypothenar muscles of the left hand showed marked wasting and the
hand was held in the position of flexion at the wrist with extension of the metacarpal
phalangeal joint. These findings were less marked on the right hand. Her feet showed
moderate cavus deformity with varus of the left foot. Knee jerks were hyperactive
and there were bilateral Babinski signs. A neurologist suggested Friedich's ataxia
as a strong diagnostic possibility. Laboratory study revealed 16 white cells, 2-|
Pandy, and 90 mg of protein in the spinal fluid. Kline test was negative. X-rays
of the hips and pelvis showed some deformity of the lower sacrum, a spina bifida
occula of S1 and normal roentgenographic appearance of the knees, skull, cervical
spine, thoracic and lumbar spine.

In June 1957 she was readmitted to the hospital for cervical myelography. A
tumor mass at the level of C6 and 7 was found on the left and a laminectomy was
performed (Fig. 5). After a sub-total resection of the extradural cervical tumor on
the left of C6 and 7, the pathological diagnosis was osteochondroma with no evidence
of malignancy. Repeated neurological examinations following surgery revealed gradual
improvement and final disappearance of all neurological abnormalities. When last
examined in September 1961, the patient was entirely normal.

3) The third case is a boy, C.H., born in July, 1956. He was hospitalized in
May, 1967 with complaints of pain produced by a bony lesion in the right shoulder.
Family history revealed that his father and a younger brother had multiple hereditary
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Figure 5

exostoses and that one other brother was free of these lesions. A great-grandfather
and one paternal aunt were said to have similar lesions.

The first lesions were noted at one year of age, when trauma to the right shoulder
had produced symptoms in a lesion there. This was removed in May, 1957. Physical
examination then revealed osteochondromata of the scapulae, femurs, tibiae, and forearms. Neurological examination was negative. A chest x-ray and dorsal spine film in May, 1967 revealed an osteochondroma involving the pedicle of the seventh dorsal vertebra on the left (Fig. 6). This lesion appeared to involve the base of the rib as well as a pedicle of the vertebra. No neurological symptoms or signs were found and his physician has elected to observe the lesion rather than suggest removal at this time.

Summary

Three vertebral osteochondromata are presented with a brief review of the literature. The large size which these lesions can attain is documented. The serious hazard if impingement on adjacent cord, cauda, and major vessels is emphasized. Early awareness of these lesions, especially in patients with hereditary multiple exostoses, and prompt excision are recommended.

REFERENCES