Agenesis of a Pedicle in the Cervical Spine

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Widening of an intervertebral foramen in the cervical spine is a striking radiological finding and generally denotes a patient with destruction caused by a malignant lesion or with neurofibromatosis. It is, therefore, important to recognize the rare case in which widening of an intervertebral foramen is the result of agenesis of a pedicle so as to avoid needless operative interference.

Case Reports

Case 1. A 46-year-old school teacher had suffered from episodes of numbness and tingling in both arms and legs, particularly on the left, for about 10 years. These attacks were worse at night, and were influenced by positioning her head and arms. They involved the entire extremity rather than a dermatome pattern. She also complained of occasional pain in the posterior cervical region and in the interscapular area.

There were no other neurological symptoms, and the only positive findings on physical examination were a hyperactive tendon reflex of the left knee and a left plantar extensor response. There was a complete range of painless motion of her cervical spine. A previous roentgenogram was interpreted as showing pathological enlargement of the right intervertebral foramen between C6 and C7. Following repeated roentgenograms (Figs. 1–8) and a cervical myelogram (Fig. 4) the diagnosis of congenital absence of the pedicle was made. The cerebrospinal fluid was normal.

It was felt that the patient’s symptoms were not related to the anomaly. The possibility that mechanical instability at the level of the defect might in some way have contributed to the patient’s symptoms was considered but was not thought to be likely at that time. No specific treatment was recommended.

Case 2. A 35-year-old truck driver injured his left shoulder and neck in a fall on May 23, 1958. Thereafter, he had occipital headaches, some pain around the right scapula, and numbness extending into the right fourth and fifth fingers.

Initial roentgenograms were interpreted as showing a fracture of the right lamina and pedicle of the 5th cervical vertebra and the patient was placed in halter traction.

The patient subsequently was referred to Dr. Howard A. Brown for evaluation approximately 4 months after the injury. At that time the only findings were slight subjective decrease in sensation over the right fourth and fifth fingers. Dr. William Obata, in consultation with Dr. Brown, made additional films (Figs. 5–7), and subsequently a myelogram (Fig. 8) at which point the diagnosis of congenital absence of the left pedicle and lateral mass of C5 was made. Consultants in neurology and orthopedics felt that there was no disability relative to the congenital anomaly. The patient was last seen 7 months following his initial roentgenograms.

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Fig. 1. Case 1. AP. There is slight angulation at the C5–C6 level with the apex to the left. The right side of this interspace is slightly narrowed. The pedicles of C5 and C6 on the right are not clearly seen.
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Fig. 2. Case 1. (Left) RAO. The pedicle of C5 is small. There is no inferior articular facet. The pedicle of C6 is absent presenting the appearance of a widened intervertebral foramen extending from the pedicle of C3 to C7. The cervical canal is widened in the anterior-posterior direction at the C6 level. On the original film the anterior portion of the right transverse process of C6 could be seen. (Right) LAO. The pedicles on the left side are all intact. Projecting through the left C5–C6 intervertebral foramen is the hypertrophied abnormal right lamina of C6, which is part of the developmental change accompanying the absent pedicle.

jury at which time the neurologic findings were normal.

Discussion

Seven cases of congenital absence of a pedicle in the cervical spine have been reported previously. Buetti referred to an anatomical description of the entity by Gruber in 1869. The first radiologic description in the literature was in a report by Hadley in 1946 of 3 cases. Subsequently, single cases were reported by Abel, Buetti, and Steinbach et al. Abel’s case was also included in an article by Hadley.

Excluding the case reported by Gruber for which there were no radiographs and temporarily excluding the second and third cases of Hadley, the remaining 6 cases presented striking similarities and will be considered as a group. In these 6 cases the pedicle and the dorsal portion of the transverse process were absent and the free end of the lamina was displaced dorsally behind the articular mass of the vertebra above. There was an anomalous articulation between the ventral surface of the abnormal lamina and the dorsal surface of the articular mass of the vertebra above. Flexion and extension views in an oblique projection of Abel’s case were made

Fig. 3. Case 1. RAO laminograph. The absence of the pedicle of C6 is clearly shown. There is no deformity or concavity of the posterior aspect of the vertebral body. The abnormal position of the lamina and superior articular facet of C6 posterior to the inferior articular process of C5 is a diagnostic finding. The pedicle of C7 is elongated, contributing to the enlargement of the spinal canal.