Angioma in the paraspinal muscles complicated by spinal epidural hematoma

Case report

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This case of angioma in the paraspinal muscles with extension into the epidural tissue was complicated by epidural hematoma in the thoracolumbar region. The hemorrhage was caused by rupture of the part of the angioma lying in the epidural tissue. A spinal bruit was of great value in diagnosing the angioma. Percutaneous embolization of the feeding arteries of the angioma reduced bleeding during surgery and contributed to successful surgical treatment.

KEY WORDS • paraspinal angioma • spinal epidural hematoma • spinal bruit • percutaneous embolization • arteriovenous malformation

Angiomas limited to the paraspinal and epidural tissues are rare.\(^1\) Epidural hematomas appear to be an unusual complication of angiomas lying in the epidural tissue\(^4\) or vertebrae.\(^8\) The case reported in this paper is quite a rare instance of angioma situated mainly in the paraspinal muscles and extending partly into the epidural tissue, where a hematoma developed. Emphasis is placed on the diagnostic and therapeutic value of a detectable spinal bruit. Percutaneous embolization reduced bleeding and facilitated surgical excision of the angioma and epidural hematoma.

Case Report

This 47-year-old truck driver was suddenly awakened at night by a severe pain in the thoracolumbar region. The pain lasted for 5 minutes and subsided within an hour. Two hours later, he became aware of complete motor weakness in both legs, loss of sensation in the lower half of the body below the level of the umbilicus, and urinary retention. The loss of sensation began to improve in both legs 1½ hours later, but the sensory impairment persisted around the waist. Ten days after the attack, he was transferred to the Neurosurgical Service of Prefectural Miyazaki Hospital.

Examination. Neurological examination on admission revealed a flaccid paralysis with diminished tendon reflexes in both lower extremities, loss of sensation corresponding to the dermatomes of T-11 through L-1 on both sides, and persistent urinary retention. A prominent bruit was audible over the T-10 and L-1 vertebrae. A lumbar puncture disclosed xanthochromic cerebrospinal fluid with a protein content of 156 mg%. Manometric testing gave no sign of spinal blockage, and a plain spine film showed no abnormality. Selective spinal angiography of segmental arteries between T-8 and L-2 demonstrated a large angioma located bilaterally in the paraspinal region (Fig. 1). The angioma was fed by branches of the segmental arteries of T-10 through L-1 on both sides, and drained into the internal and external vertebral venous plexuses. The nidus of the angioma on each side joined in the midline at the intervertebral level of T-12 and L-1. The artery of Adamkiewicz originating from the right ninth segmental artery remained intact. There was no evidence of angiomatic involvement in the vertebra. A myelogram suggested posterior epidural compression of the spinal cord at the level of T-11 and T-12 (Fig. 2).

Two days prior to surgery, percutaneous embolization of the main feeders of the angioma (the seg-
Paraspinal angioma with epidural hematoma

FIG. 1. Drawing traced from the selective spinal angiograms of bilateral segmental arteries of T-8 through L-1. The segmental artery of T-11 is missing on the right. The angioma is fed by branches of the segmental arteries of T-10 through L-1 on each side, and the two parts of the angioma join in the midline at the intervertebral region of T-12 and L-1. Adamkiewicz's artery originates from the segmental artery of T-9 on the right and runs caudally in the midline after turning sharply.

FIG. 2. Myelogram suggesting posterior epidural compression of the spinal cord at the T11–12 vertebral level.

mental arteries of T-10 and T-12 on the right and T-11 and T-12 on the left), was carried out with a mixture of small pieces of polyurethane foam and blood clots. Spinal angiography after the embolization showed considerable diminution of the angiomatous blushes (Fig. 3). The spinal bruit was reduced after the procedure. No complications were noted after the embolization.

Operation. Eighteen days after the onset of symptoms, an exploratory laminectomy of T10–12 was performed with total removal of the angioma and hematoma in the epidural tissue. The paraspinal muscles appeared ischemic due to the preoperative embolization, and no nidus of the angioma was found in the muscle layers in the surgical field. Laminectomy exposed a dark reddish mass extending from T-10 to T-12 in the posterior aspect of the epidural layer. The mass, 5 mm in maximum thickness, consisted of organized blood clots and angiomatous vascular channels. The epidural venous plexuses were dilated and the walls were very fragile. Removal of the hematoma restored a dural pulsation. The dura appeared free of invasion by the angioma. When the dura was opened, the spinal cord looked slightly pale and was depressed. The posterior spinal vein appeared slightly dilated. No other pathology was found in the subarachnoid space.

Postoperative Course. Loss of sensation in the waist region disappeared within 12 hours after surgery. The patient could walk with assistance 10 days after surgery and required no support 1 ½ months after surgery.

Microscopic examination of the epidural tissue specimen disclosed angiomatous vascular channels. Zones of organizing hemorrhage were also noted. The histological diagnosis was reported as arteriovenous malformation.

Discussion

In spite of the fact that arteries supplying the paraspinal muscles originate from a segmental stem in common with arteries to the spinal canal, angiomas in the muscle layer have rarely been found in association with spinal angiomas. Piątek reported the occasional occurrence of angioma involving all contiguous layers from the subarachnoid space to the subcutaneous tissue, apart from the skin and the dura. The patient presented in this paper had an unusual circum-

J. Neurosurg. / Volume 57 / August, 1982
FIG. 3. Spinal angiograms of the segmental artery of T-12 on the right (A, A') and on the left (B, B'), before embolization (A, B) and after embolization (A', B'). The right segmental artery of T-12 feeds the middle part of the angioma in the right paraspinal region, filling the internal and external vertebral venous plexuses at the early stage. No nidus is visible in the spinal canal. A': The nidus of the angioma is considerably diminished after the embolization with a combination of polyurethane foam and blood clots. B: The left segmental artery of T-12 supplies the middle part of the angioma in the left paraspinal region. No nidus was shown in the spinal canal. B': The angiomatic blush is reduced after embolization. Note disappearance of early venous filling of the external and internal vertebral plexuses.

scribed angioma involving the paraspinal muscle and epidural tissues but not invading the intradural space, vertebrae, or cutaneous tissue. Doppman and Di Chiro described a similar case with signs of lower spinal cord compression due to an angioma involving the paraspinal and epidural tissues at L-1. They did not operate on their patient.

Causes of spinal epidural hemorrhage are known to include trauma, anticoagulant therapy, hemophilia, and vascular anomalies. Angiomas in the epidural tissue or vertebrae are very rarely complicated by epidural hematoma. Piña described two epidural hematomas among 54 cases of epidural angioma. Epidural hematoma in the present case would be caused by rupture of the epidural part of the angioma, which extended from the paraspinal muscle layer through the intervertebral foramina.

So-called "spontaneous" epidural hematoma has been reported in more than 50 cases since its initial description by Jackson in 1869. However, the majority of these cases had been reported without noting a spinal bruix and without spinal angiography. The value of the cranial bruix in the diagnosis of cerebral arteriovenous malformation is well recognized, but little attention has been paid to the possibility of a comparable spinal bruix. Attention to the spinal bruix is of great value in the diagnosis of paraspinal angiomas.

Sargent reported a case of spinal angioma in which he was obliged to abandon an exploratory laminectomy because of bleeding from numerous angiomatic vessels in the muscles and bone. The patient died shortly after the operation. Preoperative percutaneous embolization of the arterial feeders of the angioma in the present case was performed without complications, and successfully reduced bleeding during surgery. Doppman and Di Chiro observed severe prolonged back pain due to muscle infarction following percutaneous embolization with a combination of metallic pellets and Gelfoam in two cases of spinal angioma. The procedure should therefore be carried out with great care, while being aware of the possibility of this complication.

Acknowledgment

The authors are grateful to Professor Katsutoshi Kitamura, Department of Neurosurgery, Neurological Institute, Kyushu University, for his thoughtful advice and criticism of this manuscript.

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Manuscript received January 28, 1982.
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