Ossification of spinal arachnoid with unrelated syringomyelia

Case report

Department of Neurosurgery, K. E. M. Hospital, Parel, Bombay, India

A case demonstrating a combination of ossified spinal arachnoid and syringomyelia is reported. A plea is made for denoting the condition as "ossification of the spinal arachnoid" rather than "spinal arachnoiditis ossificans."

Key Words: arachnoid, arachnoiditis, ossification, syringomyelia

Arachnoiditis ossificans is a condition with calcification or ossification of the cerebral or spinal arachnoid. This report concerns ossification in the spinal arachnoid.

The terms "arachnoiditis ossificans" or "ossifying arachnoiditis" have usually been applied to this condition; it has been an incidental finding in autopsies, during surgery, and as the cause of cord compression. Since it has never been proved that there is inflammation of the arachnoid preceding or associated with the ossification, we have preferred in this report to call it "ossification of the spinal arachnoid."

Case Report

This 39-year-old man was admitted to the medical unit of King Edward Memorial Hospital in July, 1972, and transferred to the neurosurgical service because of sudden paralysis. He had experienced progressive burning sensations all over the body for 1½ years. Six "injections" (nature unknown) by a general practitioner were followed by constipation and paresis of both legs. A myelogram done at the Calcutta Medical College Hospital was reported to the patient as revealing syringomyelia. He refused surgery at that time. During this hospital stay the symptoms remained unchanged until a fall and fracture of the left wrist, following which the legs immediately became almost totally paralyzed, but recovered slightly. There had been no history of diabetes, hypertension, root pains, or tuberculosis. He had received treatment for venereal disease. There had been no febrile episode preceding the onset of motor and sensory symptoms.

Examination. In the medical unit he was found to have a spastic paraplegia plus wasting of the lumbrical and interossei muscles of the left hand and a dissociated sensory loss below C-3 on the left and from T4-L1 on the right. Touch and position sense
Fig. 1. Myelogram, anteroposterior and lateral views, showing a block at the lower border of the T-4 vertebra. The irregular breakup of the myodil suggests arachnoiditis.

were unaffected. The supinator and biceps reflexes were normal, the triceps reflexes absent, and the leg reflexes brisk. The plantar reflexes showed a bilateral extensor response, and the abdominal reflexes were absent. When transferred to the neurosurgical service 56 days later he was found to have minimal weakness of the left shoulder as well as paraplegia, hypesthesia, and hypalgesia below C-3 on the left side and below T-4 on the right side, but no dissociated sensory loss. Perception of vibration was impaired below T-3 on the left side only. The hemoglobin was 13 gm%, sedimentation rate 10 mm, urine normal, urea nitrogen 9.0 mg%, sugar 77 mg%, and blood cholesterol 200 mg%. A lumbar puncture failed and a cisternal puncture was done; the CSF contained 1 lymphocyte/mm³, 21 mg% protein, 42 mg% sugar, and 660 mg% chloride, and the tests for syphilis were negative. The cervical spine films were normal, but the cisternal myelogram showed a total block at D-4 (Fig. 1). X-ray films of the left wrist showed a neuropathic type of arthritis.

Since the patient felt that he had been improving in the past 3 months, and the myelographic block had suggested arachnoiditis, treatment with large doses of steroids was started. Within 5 days all signs were slightly worse, and position sense had become impaired in both legs.

About 2 weeks after the first attempt, lumbar puncture was successful and a lumbar myelogram carried out showed an incomplete block at T-11. This block again suggested arachnoiditis. The lumbar CSF contained 1 cell, 62 mg% protein, 91 mg% sugar, and 620 mg% chloride.

First Operation. On September 21, a T4-7 laminectomy was performed. The dura was found to be badly adherent to the underlying arachnoid, which was ossified on its dorsal surface. The ossified arachnoid was removed by slow dissection down to the level of T-7; here it was felt that continuing the procedure...
could damage the underlying cord, and further removal was postponed. The dura was left open. The ossified portion of arachnoid removed was found to be radiopaque. Microscopic sections of the ossified arachnoid (Fig. 2) showed “well-formed osteoid tissue with concentric and lamellated bone formation and no evidence of inflammation, neoplasm, or old hemorrhage.”

Postoperatively the patient developed flexor spasms, became totally paralyzed, and required an indwelling catheter for urinary retention. On October 26, the arms were noticeably weaker. The cisternal myelogram was repeated and again showed a total block at T-4 with characteristics of arachnoiditis. The arm involvement could not be explained on the basis of the myelogram.

**Second Operation.** On November 15, a laminectomy was done from T7-9 to excise the remaining ossified arachnoid and obtain a piece of unossified arachnoid. When the dura was opened ossified arachnoid was again seen, but this time not adherent to the dura; it was easily removed without injuring the underlying cord. Below T-9 unossified but opaque arachnoid was seen and biopsied. The exposed cord resembled a blue domed cyst; with a very fine needle, 8 ml of clear fluid was aspirated. Following the aspiration the cord shrank into a membranous structure flapping forward and backward with each respiratory movement. The length of the cystic cavity was 6 cm, and a Silastic tube was left in it, the other end draining into the subdural space. The fluid from the cavity contained 3 cells/mm³, 2 lymphocytes and 1 polymorphonuclear cell, 220 mg% protein, 84 mg% sugar, and 660 mg% chloride. Microscopic examination of the ossified arachnoid again showed the structure of well-formed bony tissue with lamellae containing osteoid cells. Surrounding it was dense collagen tissue. Evidence of inflammation was conspicuously absent. The unossified arachnoid showed only dense collagen tissue.

Postoperatively, the clinical picture remained unaltered. A few days later he developed slurred speech and a nasal twang. In view of this, the high sensory loss with a normal upper cervical myelogram, plus the associated dorsal intramedullary cyst, syringobulbia was suspected and a ventriculogram was done. However, this was normal, and the slurred speech disappeared in a few days. The patient was discharged on January 2, 1973, with a total spastic paraplegia, urinary incontinence, and unaltered sensory loss.

**Discussion**

Ossification of the arachnoid is an aging process which may occasionally cause cord compression; moreover, surgical removal may be followed by recovery. The commonest sites in order of diminishing frequency are lower dorsal, lumbosacral, and cervical; it is five times more common on the posterior aspect of the cord than on the anterior. This distribution of the plaques is similar to the distribution of the arachnoid cell clusters. Some cases may appear following spontaneous or traumatic hemorrhage, and others may be caused by vascularization of dural adhesions.

The odd feature about our case was the association of the extensive arachnoidal os-
Ossification of spinal arachnoid


References