Traumatic Intracranial Arachnoidal Cyst Involving the Gasserian Ganglion

Case Report

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Traumatic arachnoidal cysts may occur wherever the arachnoid extends. We are reporting the rare instance of a cyst involving the Gasserian ganglion.

Case Report

We first saw this 58-year-old woman in September, 1962, in consultation with an ophthalmologist. Two years previously, she had complained of a burning, numb, drawing feeling, which was gradually developing in the right side of the face, starting at the side of the nose. Six months before we saw her, or approximately 18 months after the beginning of the symptoms, she noticed that the numbness was spreading to the lower jaw, mouth, tongue, and lip on the right side. There had also developed a feeling of tenderness and soreness above the eye in the ophthalmic distribution.

Because of the progression of these symptoms as well as the discomfort, the patient sought help from an ophthalmologist, who reported he was unable to find evidence of any disturbance related to the optic system. Visual fields were normal. The optic discs were flat and the vessels were normal. Movement of the eyes was normal.

There was no history of inflammation or acute illness, although she did report that 18 months before the onset of symptoms she had been in a car accident in which she received a considerable contusion of the right front-temporal region, but no fracture of the skull. She was unconscious for a short period of time, but seemed to have recovered from this injury in a normal manner, without any untoward effects, except for headache, nausea, and some vomiting for a few days afterwards.

Examination. Clinical examination revealed a normal, well-developed individual, with blood pressure of 120/80. The various systems were normal. Neurological examination showed no evidence of increased intracranial pressure. The normal ophthalmological findings were confirmed. The cranial nerves, with the exception of the fifth nerve on the right side, were normal. There was hyperesthesia in the ophthalmic division on the right side, with a slight diminution of the corneal reflex on this side. There was a complete anesthesia of the maxillary division, and hypesthesia over the mandibular division. It was noticed that there was a slight atrophy of the right temporal and masseter muscles. Cerebral and cerebellar functions were normal. Reflexes were equal and active bilaterally.

Skull x-rays were normal, except for the basal films which showed an erosion about 10×15 mm in diameter in the neighborhood of the Gasserian ganglion, extending posteriorly from the foramen rotundum. The pineal body was calcified and in the midline.

Studies of the blood, urine, spinal fluid, sedimentation rate, and P.B.I. were normal. Angiograms of the carotid arteries were interpreted as normal.

Operation. With the patient in the upright position, and under local anesthesia, a small temporal bone flap was turned on the right side. The dura was elevated from the floor of the temporal fossa, the foramen spinosum identified, and the middle meningeal artery coagulated and sectioned. As the foramen ovale was exposed, it was noticed that a bulging of the dura enveloped the ganglion mesially and anteriorly.

The dura was split at the foramen ovale and was carefully dissected free from the dura propria, which was not opened. The bulging beneath the dura propria was due to a cyst overlying the ganglion (Fig. 1). The cyst extended anteriorly and mesially to the

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Fig. 1. The dura has been split and the foramen ovale exposed. The protrusion of the pedicle of the arachnoidal cyst is seen through the dura opening (A). The cyst is seen to extend from the foramen rotundum to the petrous ridge (B). The opened cyst reveals the eroded maxillary portion of Gasserian ganglion (C).

The foramen rotundum and back over the ganglion to the petrous ridge. The cyst contained a clear fluid, rather than blood or some other cystic material. About 10 cc of fluid were aspirated. When the cyst was opened the Gasserian ganglion could be seen completely uncovered and exposed. The third-division fibers were reduced in volume while the second-division fibers had been practically destroyed (Fig. 1). The ophthalmic branch was not completely uncovered, but it could be seen in the anterior mesial portion of the field. With a nerve hook, it was possible to feel the defect in the skull which had appeared in the roentgenograms.

The dura above had been perforated and the arachnoid had protruded through onto the ganglion. Aided by the normal pulsation of the subarachnoid space, it had gradually extended over the entire ganglion. The maxillary portion was in the direct line of impact and was destroyed. This erosion process extended on into the skull itself.

A nerve hook was placed in the dural opening and the dura covering the temporal lobe above was incised. The incision was carried posteriorly to the notch where the posterior root of the Gasserian ganglion passes over the petrous ridge. This gave adequate communication with the subarachnoid space. It was noticed that the root bundle of the ganglion was definitely smaller than normal, and did not float back and forth in the spinal fluid as is usually the case when this root is sectioned for tic douloureux or other reasons.

Postoperative Course. The patient made an uneventful recovery from surgery and has had a satisfactory postoperative course. Anesthesia has persisted in the maxillary distribution, but the burning pain in the ophthalmic and mandibular divisions have completely subsided. Subsequent x-rays have shown no additional skull changes.

We have not found a similar case reported in which the base of the skull was eroded or the Gasserian ganglion was involved. The progressive insidious development of symptoms and the location suggested the presence of an aneurysm, a chordoma, or some of the other congenital lesions. The history of
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trauma is pertinent and should have led us to suspect a traumatic arachnoidal cyst.

Discussion of Traumatic Cysts

Arachnoidal cysts may occur anywhere along the dural and arachnoidal coverings of the brain and spinal cord; they tend to gradually enlarge and can be quite destructive. These accumulations of fluid are most often traumatic in origin, but may be congenital or inflammatory.

The traumatic cases are represented by two main categories. First, there are those that result from arachnoidal adhesions occurring from blood or blood elements; and second, the more important group of cysts that result from considerable trauma and produce a rent in the dura through which the arachnoid protrudes and gradually enlarges, destroying the structures around it. In these cases, there has usually been a severe head injury and a fracture of the skull. They usually occur above the tentorium.

After the injury, the tear in the dura usually heals and soon the extradural fluid, if any, is absorbed. However, sometimes this is not the case, especially if there is some local bleeding. Instead, the arachnoidal protrusion gradually enlarges due to expansile action produced by pulsation of the spinal fluid, as mentioned by Elkin and Taylor. The tissue immediately in contact with the pulsation becomes eroded.

In the case of our patient, the Gasserian ganglion was in the immediate vicinity, and the maxillary portion was gradually destroyed. This extended even to the bone beneath. It is not unusual for the cases, accompanied by fracture of the calvaria, to erode through the skull, producing sizable lesions which have a characteristic appearance by x-ray and give a typical history of development, as noted by Taveras and Ransohoff.

Both tables of the skull become eroded and produce a characteristic thinning and then an expansible appearance of the outer table. The bone about the outer table may appear eburnated. Eventually, small perforations occur and fluid leaks under the pericranium.

We have had two such cases; Taveras and Ransohoff have reported seven.

Traumatic cysts tend to progressively destroy the skull and surrounding tissue. Sometimes the cerebrum itself is involved to a considerable extent, depending upon the degree of injury at the time of the initial trauma. The closure of the dura and a cranioplastie repair of the skull will usually be sufficient.

Summary

We have presented a case of traumatic arachnoidal cyst that extended through the temporal dura over the Gasserian ganglion and eroded through the maxillary portion of the ganglion and the base of the skull beneath.

References