Extradural hematoma during craniotomy

Report of five cases

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The author describes five instances of extradural hematoma that developed during craniotomy. The hematomas extended basally from an original craniotomy near the midline and four required immediate additional surgical exposure. This rare complication should be remembered during craniotomy if the brain appears to be swelling without obvious reason.

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On January 25, 1965, during an operation aimed at an aneurysm of the left internal carotid bifurcation, the frontal lobe suddenly started to swell. Exposure of the aneurysm was abandoned, and the dura closed hurriedly. No apparent cause for the swelling could be found at first; however, an enormous extradural hematoma extending backward from the posterior rim of the frontal bone flap was ultimately found. The original flap was closed and a parietal one turned to remove the extradural hematoma and provide access for hemostasis. The patient did well, and the aneurysm was clipped on February 1.

Since then we have seen four more cases of this unpleasant type of operative complication. As the complication seems rare and there is no mention of it in standard textbooks, a short description seems worthwhile.

Case Reports

Case 1

This was the 29-year-old woman mentioned in the introduction.

Case 2

This 50-year-old woman had an ependymoma removed from the left lateral ventricle through a frontal approach on March 22, 1968. As the frontal horn was being explored, the brain appeared to be swelling. A large extradural hematoma was found extending posteriorly and basally from the bone flap. The visible portion of the hematoma was removed, and the foramen spinosum plugged; the tumor was then removed, and the wound closed. A parietal flap was immediately turned; the remainder of the extradural hematoma was removed and hemostasis secured. The postoperative course was complicated by high intraventricular pressure necessitating ventricular drainage and hospitalization until death 2 months later.

Case 3

This 34-year-old man had a right frontal astrocytoma removed by a large lobectomy (130 gm) on August 20, 1968. The operation was complicated by troublesome
“swelling” of the frontal lobe from the start, even before the lobectomy was started. When eventually the dura had been closed, a large extradural hematoma extending backward over the whole parietal area was found. The hematoma was removed through the frontal craniotomy; on August 23, more hematoma was removed and hemostasis secured through an enlarged parietal burr hole. The patient then recovered uneventfully.

Case 4

A 39-year-old man was operated on on May 9, 1972, for a left occipital meningioma of the falx. The operation was long and sanguinary; 22 pints of blood had to be transfused. The tumor had been removed and its attachment to the falx excised when it seemed the occipital lobe was swelling. An extradural hematoma had developed anteriorly extending along the base from the bone flap. A second bone flap was turned anteriorly and the hematoma, which extended into the anterior temporal region, was evacuated (Fig. 1). Recovery was complicated by meningitis, which subsided with antibiotics.

Case 5

This 23-year-old man had a left posterior parietal parasagittal meningioma removed on February 27, 1973. Toward the end of the procedure, as hemostasis was well under way, an extradural hematoma was found extending basally and forward from the craniotomy. Since the hematoma was thin and there was little extradural bleeding or evidence of rising intracranial pressure, nothing further was done. A left carotid angiogram performed immediately after the wound had been closed verified the presence of a thin extradural hematoma (Fig. 2). The patient recovered uneventfully without specific therapy.

Discussion

Extradural hematomas that develop beyond the original bone flap during craniotomy are rare. The five we have reported since 1965 occurred among the approximately 400 formal craniotomies we do each year.
ventricular puncture. However, only in Cases 1 and 2 is it possible that during the operation so much CSF had been sucked out that the dura fell away from the bone; in Case 3, the frontal lobe started protruding as soon as the first biopsy for a frozen section had been taken, even before lobectomy had been started. In Cases 4 and 5, there was little extra space during removal of the tumor.

Our routine operative policy includes the placement of stay sutures in the dura all the way around the flap at the time of turning the dural flap. Also, after completion of the intradural portion of the operation and closure of the dura, permanent tacking sutures are placed at intervals of 1 to 1\(\frac{1}{8}\) cm. The complications reported occurred despite the fact that these precautions were taken in all five cases.

We suggest that during craniotomy if the brain appears to be swelling in spite of adequately controlled conditions, it is worth examining the boundaries of the bone flap carefully for the type of operative hematoma described in these five patients.

References


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