Epidural Hemorrhage from Traumatic Laceration of Internal Carotid Artery

Case Report

WALTER R. WHITEHURST, M.D.,* AND FRED K. CHRISTENSEN, M.D.

Birmingham, Alabama

Epidural bleeding from the middle meningeal artery is a fairly common result of cranial trauma. A less common source is bleeding from the major venous sinuses. The present report concerns a very unusual source of epidural hemorrhage, laceration of the internal carotid artery at the base of the skull.

Case Report

This 20-year-old man was involved in an automobile accident 6 hours prior to his transfer to David Grant United States Air Force Hospital, Travis Air Force Base, California. At the time of his arrival, he was semi-comatose, and no further history was available.

Examination. Temperature was 103°F, respirations normal, and blood pressure stabilized at 110/60. The patient had no verbal response. He moved all extremities spontaneously, the left less so than the right. A definite left hemiparesis was noted in the reaction to painful stimulus. There were small abrasions behind the right ear and bloody spinal fluid was draining from both ears. There was a large amount of blood in the posterior oropharynx. The pupils were equal and reactive, and no papilledema was present. There were no other significant physical findings. Hematocrit was 37%. Skull x-ray films demonstrated a right parietal skull fracture.

Because of progressive deterioration, a right carotid arteriogram was carried out, and this demonstrated a large epidural hemorrhage with extravasation of the contrast medium into the right epidural space (Figs. 1 and 2).

Operation. Under local anesthesia, a right temporal craniectomy was carried out. There was a blood clot in the epidural space and the dura was markedly depressed. A small portion of the clot was removed, and massive hemorrhage followed that appeared to be coming from the base of the middle fossa. Cauterization of the middle meningeal artery at the foramen spinosum had no effect on the uncontrollable bleeding. The fracture line was followed to the foramen lacerum and packing the area also failed to stop the bleeding. Despite the administration of large amounts of blood, cardiac arrest occurred, and attempts at resuscitation failed.

Postmortem Examination. Significant findings were limited to the head. There was a fracture of the middle fossa that extended down the right parietal bone, along the petrous portion of the temporal bone and into the foramen lacerum. There was a second fracture that extended along the sphenoid ridge into the foramen lacerum, the apex of these two fractures being at the point of entrance of the carotid artery into the skull. Microscopic sections of the brain showed extensive subarachnoid hemorrhages of the left frontal and temporoparietal regions with variably sized petechial and small hemorrhages within the cerebral cortex. In carrying out the examination, to ascertain the source of bleeding, the carotid vessels in the neck were exposed. The intracranial portion of the right internal carotid artery was isolated and occluded at the posterior communicating artery. Embalming fluid was injected into the neck vessels and a tear in the lateral wall of the artery was demonstrated at the foramen lacerum.

Received for publication January 24, 1969.

* Present address: 909 18th Street South, Birmingham, Alabama 35205.

352
Epidural Hemorrhage from Internal Carotid

Discussion

The sources of traumatic epidural bleeding are most commonly the middle meningeal artery and the major venous sinuses. A totally unsuspected source was encountered in the laceration of the wall of the internal carotid artery at the foramen lacerum in this patient. The internal carotid artery may be injured at the base of the skull and the most common site for its rupture is into the cavernous sinus. This complication occurs a little oftener than once per year in a large trauma service. The artery may also rupture into the sphenoid sinus resulting in severe epistaxis. Extravasation of the contrast medium into the epidural space is occasionally encountered, but not as massively as that in this patient. A retrospective review of the arteriograms showed extravasation of the

Fig. 1. Angiograms, early arterial phase. Left: Lateral view showing extravasation of contrast medium in a cone-like fashion down the internal carotid artery. Right: Anteroposterior view showing filling of the middle cerebral artery and the dye extravasation.

Fig. 2. Angiograms, late arterial phase showing the extent of the epidural hematoma. Left: Lateral view. Right: Anteroposterior view.