The Value of Angiography in Diagnosis of Extradural Hematoma of the Anterior Fossa

Report of Two Cases

Ibrahim Higazi, M.D., and Ahmed El-Banhawy, M.D.
Department of Neurological Surgery, Ein-Shams University School of Medicine, Cairo, Egypt

Ever since it was described in 1886 by Jacobson, extradural hematoma has come to be closely associated with the middle cranial fossa. This association has been so repeatedly emphasized over the years that the possible formation of extradural hematoma elsewhere is apt to be overlooked. The incidence of hematomas outside the middle fossa and their contribution to the total high mortality rate of extradural hematomas in general has only been recently recognized.

Recently 2 cases of extradural hematoma of the anterior fossa came to our notice. Despite the classic clinical picture pointing to the middle cranial fossa, angiography was used as a method of diagnosis. The hematoma was accurately and promptly localized in both cases and treatment successfully carried out. These cases stimulated us to review the literature of anterior fossa extradural hematoma for methods of diagnosis and the result of treatment. It became clear to us that the generally accepted method of multiple burr-hole inspection leaves much to be desired, and that more use should be made of angiography in cases of suspected intracranial hematoma.

The purpose of this paper is: (1) to report 2 cases of a rare lesion and to review its literature; (2) to demonstrate the value of angiography in the management of these cases; and (3) to describe the angiographic features of an extradural hematoma of the anterior fossa.

Case Reports

Case 1. This 42-year-old man was unconscious for 15 minutes after a car accident. Thereafter his consciousness cleared but in 3 hours he became confused and irritable and began to develop weakness on his left side. On examination 15 hours later, there was left hemiparesis with bilateral extensor plantar responses. The right pupil was dilated and fixed, the left normal. The vital signs were within normal range. Roentgenograms of the skull revealed an extensive linear fracture involving the right temporoparietal area and extending across the midline to the left frontal region. Right carotid angiography was performed 18 hours after the accident. It revealed a huge subfrontal mass (Figs. 1 and 8).

Operation. Right frontal craniotomy was done 2 hours after the accident. A large extradural clot was evacuated. Multiple linear fractures were noted in the right orbital roof but no definite source of bleeding was seen.

Postoperative course. Tracheostomy was performed 1 hour postoperatively. Thereafter the patient made an uneventful recovery. A repeat right carotid angiography done on the 10th postoperative day was normal (Fig. 2). The patient was neurologically normal, and was discharged on the same day.

Comment. The protracted course of the case is noticeable. Exploration of the middle fossa, abundantly justified by the classic clinical picture, would certainly have missed the hematoma. The linear fracture was not diagnostically helpful. It was extensive and involved both sides. There is little doubt that angiography saved the patient.

Case 2. This 22-year-old recruit was rendered unconscious immediately following a car accident. When seen 6 hours later he was in deep coma. He seemed to react to painful stimuli less readily on the left side. Abdominal reflexes were bilaterally absent. The Babinski response was extensor on both sides. The right pupil was dilated and reactive, the left normal. The vital signs were little affected. X-rays showed a linear fracture crossing the middle meningeal groove in the right temporal region. Right carotid angiography, done 14 hours after the accident, revealed a right frontotemporal mass (Figs. 4A, 5B, and 6A and D).

First Operation. Right frontal craniotomy performed 20 hours following the accident revealed a large clot on the lateral aspect of the right frontal lobe. It was completely evacuated. No definite source of bleeding was detected.

Postoperative Course. The patient made a fairly smooth recovery. It was noted, however, that at times he was confused and drowsy and complained of severe headaches. The optic discs looked normal. The visual fields could not be determined due to the patient's lack of cooperation.

A repeat right carotid angiography was done on the 7th postoperative day. It showed the anterior cerebral artery almost on the midline, with the transverse segment stretched and displaced upward (Fig. 6B and E). The elevation of the anterior cerebral artery in the anteroposterior view of the angiogram suggested a suprasellar mass. To rule out a normal variant, an air study was done on the following day. The result confirmed the presence of a suprasellar mass.

Second Operation. On the 17th postoperative day, the original frontal flap was elevated. Neither in the frontal nor in the suprasellar region was there any evidence of extradural clot. On incising the bulging dura in the prechiasmatic region about 25 cc of liquid blood were

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Fig. 1. Subfrontal extradural hematoma. Right carotid angiogram: preoperative. A. Lateral view. The anterior cerebral artery is displaced upward and backward. The fronto-polar artery is also displaced. Note the absence of vessels in the subfrontal region. B. Anteroposterior view. The anterior cerebral artery is stretched, bowed and markedly displaced toward the left side.

Fig. 2. Subfrontal extradural hematoma. Right carotid angiogram: postoperative. The anterior cerebral and fronto-polar arteries have resumed their normal position. The subfrontal area is revascularized. A. Lateral view. B. Anteroposterior view.

released. There was a well-formed though thin, outer membrane.

Second Postoperative Course. The patient made an uneventful recovery. Right carotid angiography was repeated on the 10th day following the 2nd operation, and showed the transverse segment of the anterior cerebral artery within normal limits (Fig. 6 C and F).

Comment. Again there was a prolonged course. Angiography was valuable in demonstrating the multiple lesions. The linear fracture in the middle fossa was an unreliable guide to the location of the clot. Suprasellar subdural hematoma is rare. Dandy described and depicted a case, but his was a chronic isolated lesion, diagnosed by ventriculography a year after the accident. The simultaneous occurrence of two unusually located hematomas in the same case must be considered rare indeed.