Interhemispheric subdural haematoma: a case report

L. J. CLEIN AND C. F. BOLTON

From the Departments of Neurosurgery and Neurology, University Hospital, Saskatoon, Saskatchewan, Canada

Interhemispheric subdural haematomas have been reported infrequently in the past. The clinical features are not distinctive and, in previous publications, carotid angiography only has been used in establishing the diagnosis. In the present case both pneumoencephalography and electroencephalography also contributed to the diagnosis.

CASE REPORT

Mr. J. K., aged 38, was admitted to the University Hospital around midnight on 12 May 1968, approximately one hour after a motor vehicle accident. No details regarding the events of the accident were available.

His breath smelled strongly of alcohol and there was a 2 in. laceration over the left posterior-parietal region of the scalp. He was very drowsy but responded to painful stimuli by moving all limbs, the right side more than the left. There were no other localizing neurological signs. He did not obey simple commands or answer simple questions. An echoencephalogram revealed no displacement of the midline echo. Radiographs of the skull showed no fracture.

Five days later the patient was still very unresponsive except to painful stimuli. On the tenth day after admission he was improved but still drowsy and quite withdrawn and uncommunicative. His affect was very flat and he said only single words or grunted in an inappropriate fashion. Simple commands were obeyed poorly and he was disoriented and had severe memory loss for recent events. For the next 10 days the patient remained the same. Repeated observations failed to reveal any evidence of raised intracranial pressure and at no time was papilloedema noted. It was felt that three weeks after the injury some greater improvement should have occurred. A pneumoencephalogram was considered to exclude a subdural haematoma or post-traumatic hydrocephalus as possible causes of the patient's failure to improve.

On 3 June a pneumoencephalogram followed by a left carotid angiogram were performed (Figs. 1, 2, 3, 4). The ventricles filled well and were dilated. A large, smooth, semilunar defect due to a mass was seen indenting the upper and anterior aspect of the body of the lateral ventricles in a symmetrical fashion. In the cerebral angiogram the anterior cerebral artery was stretched over the mass and the pericallosal and callosomarginal arteries were separated posteriorly. The venous phase (Fig. 4) showed displacement laterally of the medial

part of the left hemisphere. The cerebrospinal fluid findings at the time of pneumoencephalography were unremarkable. The pressure was normal and the fluid was clear and colourless. There was 29 mg protein/100 ml. and 42 white blood cells/c.mm.

A pre-operative electroencephalogram (Fig. 5) showed no evidence of alpha activity, and background rhythms consisted mainly of generalized high amplitude semi-rhythmic 1 to 3 c/s activity. This activity waxed and waned in amplitude and showed a phase reversal over the vertex. It was most prominent in the frontal regions and was little affected by eye opening. Photoc stimulation elicited a bilateral following response in the occipital regions.

On the basis of these investigations a diagnosis of interhemispheric subdural haematoma was made.

OPERATION On 5 June 1968, a right fronto-temporal craniotomy was performed. A thin layer of subdural haematoma was observed over the hemisphere which extended medially between the hemisphere and the falx. Exploration was carried down between the right hemisphere and the falx and a subdural haematoma was found consisting of both solid and liquid components measuring approximately 20 ml. (Fig. 6). This was removed; no bleeding point was found.

POST-OPERATIVE COURSE Post-operatively the patient made a slow recovery. Immediately his sensorium was brighter and he conversed at greater length than he had at any time before surgery. He was able to give the police information about the accident, which he had been unable to do before. He continued to improve and one month post-operatively was alert, active on the ward, and fully independent in his daily functions. However, there was still moderate apathy, loss of affect, moderate disorientation in time and place, and memory loss for recent events. The EEG recorded at this time showed a definite improvement (Fig. 7); the abnormal delta rhythms were reduced in amplitude and alpha activity had returned. Six months later the patient was completely well and had returned to work. However, he had amnesia for the accident and a post-traumatic amnesia for about two months. His EEG at this time was normal.

DISCUSSION

With the increasing number of motor vehicle accidents resulting in severe head injuries, it is surprising

FIG. 1. *Pneumoencephalogram showing smooth mass displacing upper anterior end of lateral ventricles.*

FIG. 2. *Left carotid angiogram superimposed on pneumoencephalogram. Note separation of pericallosal and callosomarginal arteries posteriorly.*

FIG. 3. *Left carotid angiogram. Lateral view.*

FIG. 4. *Left carotid angiogram; venous phase to show lateral displacement of hemisphere.*

FIG. 5. This pre-operative EEG shows generalized delta activity which is most prominent in the frontal regions and has a phase reversal over the vertex.

FIG. 6. Operative photograph showing interhemispheric haematoma.

FIG. 7. The post-operative EEG is considerably improved in comparison with the pre-operative one.

that the diagnosis of interhemispheric subdural haematoma has not been made more frequently. It must be presumed that the condition is extremely rare.

In this case the mental status and other findings on neurological examination were much like those seen in severe concussive head injuries. However, the patient's failure to improve as early as expected led to further investigations. Both angiography and pneumoencephalography gave striking evidence of a frontally situated interhemispheric mass lesion and, together with the clinical picture, allowed us to make an almost certain diagnosis of interhemispheric subdural haematoma. Angiographic findings, first described by Jacobsen (1955) and confirmed by Gannon (1961) and Wollschlaeger and Wollschlaeger (1964), are well demonstrated in this case. The pneumoencephalogram gave a picture much like that seen in neoplasm of the corpus callosum but the smooth symmetrical depression of the corpus callosum was more suggestive of an interhemispheric collection of fluid; to our knowledge this is the first time such a lesion has been demonstrated by pneumoencephalography. Similarly, the recording of an electroencephalogram in this condition has not been described previously. The pre-operative electroencephalogram showed generalized delta activity which is similar to that seen in patients with severe concussive head injuries (Dawson, Webster, and Gurdjian, 1951). However, the promi-

nence of delta frequencies in the frontal regions with phase reversal over the vertex is also compatible with an interhemispheric mass lesion and one wonders if some patients with these EEG changes may have harboured such a lesion and have been erroneously diagnosed in the past as simple concussion.

SUMMARY

A case of interhemispheric subdural haematoma is reported. The clinical features were those of severe concussion but an unusually long recovery period prompted more extensive investigations. Characteristic features of this lesion were demonstrated by angiography and pneumoencephalography and, while electroencephalographic changes were helpful, they were less specific. The haematoma was dealt with directly by craniotomy with beneficial results, but it is possible that this lesion could be managed by burr hole and aspiration.

REFERENCES

- Dawson, R. E., Webster, J. E., and Gurdjian, E. S. (1951). Serial electroencephalography in acute head injuries. *J. Neurosurg.*, 8, 613-630.
- Gannon, W. E. (1961). Interhemispheric subdural hematoma. Case report. *Ibid.*, 18, 829-830.
- Jacobsen, H. H. (1955). An interhemispherically situated haematoma; case report. *Acta Radiol. (Stockh.)*, 43, 235-236.
- Wollschlaeger, P. B., and Wollschlaeger, G. (1964). The interhemispheric subdural or falx hematoma. *Amer. J. Roentgenol.*, 92, 1252-1254.