FAT EMBOLISM
A PROBLEM IN THE DIFFERENTIAL DIAGNOSIS OF CRANIOCEREBRAL TRAUMA

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In spite of the frequency with which fat embolism involves the central nervous system there have been few reports written by neurosurgeons and neurologists on this topic. A consideration of fat embolism is important in the differential diagnosis in patients who have received extensive lacerations or long bone fractures concomitantly with head injuries. Within a period of 6 months 3 patients with lesions of this type have passed through the Neurosurgical Service at University Hospital. In addition to fractures of various long bones the tentative diagnoses in these cases at the time of admission were extradural hemorrhage, subdural clot, and midbrain injury, respectively. Following is a brief presentation of these 3 cases.

CASE REPORTS

Case 1. M.B., a white female aged 20, was admitted to a local hospital at 3:00 a.m. on July 30, 1950 after being injured in an automobile accident. She suffered a simple fracture of the right femur and the left tibia, and multiple lacerations about the head and left groin. At admission the patient was conscious and her neurological status was negative. The fractured extremities were placed in casts. About noon she became progressively more stuporous and at 5:00 P.M. her physician noted a dilated pupil and bilateral pyramidal tract signs and transferred her to University Hospital.

By 9:30 P.M. a definite paresis of the left arm had developed and there were focal seizures of the left side of the face. B.P. 140/100, pulse rate 106, and respirations 22. A diagnosis of probable right temporoparietal extradural hematoma was made.

Operation, July 30, 1950. Multiple burr holes were made bilaterally, but no epidural or subdural hematoma was found. There was some evidence of contusion at both frontal trephine holes and the brain pulsed freely with no tendency to extrude.

Course. Her condition remained unchanged until 48 hours postoperatively when it was observed that respirations had become more labored. The pupils were still equal. Petechial hemorrhages appeared on the skin of the neck, trunk and upper extremities (Fig. 1) and the diagnosis of fat embolism was suggested. Fat globules in the urine confirmed the diagnosis.

On Aug. 4, 1950 the ophthalmological consultant found ecchymosis of the left eyelid with occasional petechial conjunctival hemorrhages. The right fundus displayed a slight cloudiness of the media due to fat droplets. The disc margins were distinct. Along the superior and inferior temporal vessels there were large cotton-wool exudates, and about the macula there was a gray cloudiness of edema. An oc-
casional superficial hemorrhage was present. The pattern was similar in the left fundus except there were more superficial hemorrhages and no large exudates.

On August 9, after an attempt was made to reduce the fracture in the right leg a marked spasticity developed in all extremities, but a week later the patient appeared definitely improved and responded to verbal stimuli.

On August 17 her temperature rose suddenly to 102°F., pulse to 160, and B.P. to 160/90. There was onset of clonic twitching and jerking of extremities with intermittent periods of complete extension and marked opisthotonos. She gradually improved, passing through a stage of decerebrate rigidity during which she moaned and groaned almost constantly. Because of the severe extensor spasms of her lower extremities resulting from the lesions of the central nervous system, it was necessary to permit 2 inches of shortening of the right femur.

The patient was discharged on October 15 in a bilateral hip spica. Her mental status had improved markedly, but there was still emotional lability.

On April 10, 1951 a follow-up examination revealed that the patient was mentally sound and alert. The fundi were normal. A mild Horner’s syndrome was observed on the left. Tonus was normal in all extremities, but a minimal left hemiparesis was elicited with bilateral pyramidal tract signs. Her general condition was excellent and there was daily improvement in her neurological status.

Comment. The chronological appearance of symptoms should be reviewed. The onset of mental confusion and lethargy occurred about 12 hours after the accident, a short time after a cast had been applied to the left leg, suggesting the liberation of a shower of emboli. Fat globules were found in the urine 60 hours after the accident. The petechial hemorrhages on the skin of the neck, trunk, and upper extremities and the abnormal fundi were observed on the 3rd and 4th days after injury, respectively. Within 9 days after her admission the patient had improved markedly but suddenly there was temperature elevation with onset of tonic seizures of the extremities indicating the release of another deluge of fatty emboli to the brain stem.

Fig. 1. Case I. The periorbital ecchymosis associated with the head injury is demonstrated. Unfortunately the petechial hemorrhages of the skin of the neck and upper chest are not readily visualized.