Case Reports

Subdural Hematoma Following Pneumoencephalography

Case Report

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PNEUMOENCEPHALOGRAPHY is often necessary when intellectual deterioration occurs without obvious cause. When cerebral atrophy is demonstrated, further deterioration following pneumoencephalography may be attributed to progression of a degenerative process.

We have recently observed an adult in whom a subdural hematoma followed pneumoencephalography. Roentgenograms had clearly demonstrated cerebral atrophy in this patient who suffered from Huntington's chorea. Degeneration of her mental state after the pneumoencephalogram was at first ascribed to the natural course of her disease.

Case Report

The patient, a 56-year-old housewife, had been well in her early adulthood. Her mother, a brother, and one of her 13 children had Huntington's chorea.

Mental deterioration and chorea had first become manifest when she was 39 years old. She was placed in a nursing home 5 months before she was first evaluated at University Hospital, because of the severity of the irregular choreiform movements and grimacing. Initial failure of short-term memory was followed by a steady decline in all mental capacities.

Examination. The patient was unable to relate her history; her replies were largely restricted to "yes" and "nope." Speech was halting, and she could neither give the date nor engage in conversation. Voluntary movements and rest were interrupted by quasi-rhythmical, choreiform movements of the arms and legs, twisting of the trunk, and grimacing. Ocular rotations were full and conjugate, but she had considerable difficulty accomplishing lateral and vertical gaze. She was unable to protrude her tongue on command. Strength was preserved in the arms and legs; sensation was intact throughout. The alternate motion rate was reduced in the arms and legs, and finger-to-nose and heel-to-knee tests were grossly clumsy. Gait was lurching and grotesque, and the stretch reflexes were normal; there was no Babinski sign.

Urinalysis, hemogram, roentgenograms of the skull and chest, liver function tests, and electroencephalogram were normal. Psychological testing revealed severe generalized intellectual deterioration.

Pneumoencephalography was carried out on April 29, 1966. The patient was given meperidine HCL (Demerol) 100 mg, promethazine HCL (Phenergan) 50 mg, and Atropine 0.4 mg intramuscularly ½ hour before the procedure. The patient was seated in a pneumoencephalogram chair with the neck flexed to an angle of 35° and her head resting on head clamps and the x-ray cassette. Following skin infiltration with 1% procaine, a lumbar puncture was carried out, but no fluid was removed. Lateral filling films were obtained by the instillation of two increments of 7 cc room air. An autotomogram of the third and fourth ventricles was obtained by exposure while the head was rotated back and forth in a small arc as a third 7 cc increment of room air was instilled. After 25 cc of room air were instilled slowly, the head and neck were extended, and 5 cc air were then instilled to fill the cisterns and subarachnoid spaces. A total of 5 cc of cerebrospinal fluid

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was removed for the determination of protein and for serologic testing. Reverse Towne's and lateral views were taken with the patient in the erect posture. The patient was returned to a supine position and taken to her bed without further manipulation. No unusual reaction was observed, and she tolerated the procedure well.

The ventricular system was moderately enlarged but in normal position. The caudate nuclei were reduced in size. The basal cisterns contained normal amounts of air, but in the cortical subarachnoid space there was a tendency to pooling. Some subdural air was noted. The appearance was that of generalized atrophy (Figs. 1 and 2). The cerebrospinal fluid protein was 41.5 mg%.

The patient tolerated the procedure well and was allowed to be up the following day. Her hospitalization was prolonged for other observations. She was not as responsive as she had been and no longer walked to the bathroom; there were no localizing signs, but by 2 months after the pneumoencephalogram she had become a total care problem. Her general decline was ascribed to her disease, and she was discharged to a nursing home.

Three weeks later her daughter reported that she was even less alert, did not use her right arm well, and was not talking as usual and apparently could not see well. She was readmitted to University Hospital.

Second Admission. She was quiet and had moderately sluggish mental reactions. There was a right hemiparesis with a flexion-pro-nation posture of the right arm, and the right nasolabial fold was flattened. The choreiform movements and grimacing were absent on the right side of the body. Gaze was predominantly to the left and could not be shifted on command. She neglected the right visual field. The optic discs were flat.

Plain roentgenograms of the skull were normal; there was no evidence of fracture. A brain scan revealed an area of increased uptake on the left. The spinal fluid was under normal pressure. The protein was 42 mg%, and there was no xanthochromia. A left carotid angiogram revealed a large extracerebral mass in the left parietal region, located in the area of most notable atrophy previously demonstrated by pneumography. A large subdural collection of blood (175–200 cc) was drained through a burr hole over the parietal boss. The patient made an uneventful recovery and regained the use of her right arm. She was able to talk with her family and walk without assistance when she was discharged. The chorea returned to the right side.

![Fig. 1. Right brow-up lateral view (left) of pneumoencephalogram showing moderate enlargement of the lateral ventricles and a tendency to pooling of air in the subarachnoid space over the frontal pole. No evidence of subdural hematoma. Anteroposterior view (right) of pneumoencephalogram showing enlarged lateral ventricles and increased air over the left hemisphere. A small amount of subdural air is located above the left lateral ventricle. No evidence of subdural hematoma.](image-url)