FATAL BRAIN-STEM SHIFT FOLLOWING HEMISPHERECTOMY

FERNANDO CABIESES, M.D., RAÚL JERI, M.D.,
AND RODOLFO LANDA, M.D.

Department of Neurosurgery, Instituto Nacional de Enfermedades Neoplásicas, Lima, Perú

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ALTHOUGH the first successful hemispherectomy was performed back in 1923 by Dandy,14 who followed his first experience with a series of 6 cases, only recent advances in surgical technique, and perhaps a better understanding of neurophysiology, have made this operation the procedure of choice in certain cases of infantile hemiplegia1,8,18,20,26-29,22,34,39,45 and a daring method for the so-called radical treatment of certain brain tumors.2,4,14,24

Since Krynaus27-29 published his series, a large number of interesting reports, dealing with the uniformly satisfying results of this procedure, have invaded the literature. It was this powerful forward swing of the pendulum that prompted Mackay31 to make a plea for some emphasis on contraindications and disadvantages, even failures, if these were encountered.

During the last 18 months, we have performed 5 hemispherectomies in patients with infantile hemiplegia. Three of them were clearly benefited by the operation and have been followed for 18 months, 15 months, and 11 months, respectively. They have shown marked improvement in their behaviour, definite relief of spasticity which facilitates rehabilitation procedures, and they are free of convulsions. The other 2 cases constitute the basis for this report because they presented a fatal complication which has not been reported in the literature reviewed by us and which, if interpreted correctly in this communication, calls attention to interesting points of intracranial dynamics.

CASE REPORTS


History. A.E., male, 23 years old, was hospitalized at the Instituto Nacional de Enfermedades Neoplásicas on Nov. 28, 1954, complaining of generalized convulsions. He was the first child, of normal parents. The delivery was somewhat difficult, and he was born cyanotic and had difficulty in breathing for several minutes. When he was 4 months old, fever, generalized convulsions and a left hemiplegia developed. Since the age of 12 he had had crises which were preceded by a sensation of "emptiness" in the epigastrium and clouding of vision; then he became unconscious suddenly and had a grand mal seizure. He usually had two to three fits a month. He was quiet, humble, obedient, sociable, solicitous, affectionate and very attached to his mother, who cared for him devotedly because of his physical handicap. In
1953 his behaviour changed, possibly because of his stepfather's hostility, who was resentful because the boy did not work. The patient became irritable and developed temper tantrums. On one occasion he attacked his stepfather. He also became aggressive toward his brothers, quarreled with them frequently and expressed suicidal ideas.

Examination. He was a young man with a left spastic infantile hemiplegia. He was anxious, with a strong feeling of inferiority caused by his seizures and deformity. The mental tests (Wechsler-Bellevue scale) showed that he was a moderate mental defective. He had some insight and realized that he was excitable, anxious and irritable.

The electroencephalogram showed discharges of slow waves at the right frontal leads and in lesser degree at the left side with propagation to the parietotemporal leads. There were also many paroxysmal spike discharges in the right frontoparieto-temporal leads. It was concluded that these signs were compatible with bilateral cortical atrophy, more marked on the right side. Plain roentgenograms of the skull showed no abnormalities. Pneumoencephalography (Fig. 1) revealed considerable dilatation of the right lateral ventricle with slight retraction which included the 3rd ventricle and left lateral ventricle. There were also signs of right cortical hemiatrophy. The cerebrospinal fluid pressure was 140 mm. of water. The fluid was clear and colourless, did not coagulate and contained 0 cells per c.mm.; protein was 36 mg. and chloride 780 mg. per cent; Pandy, Nonne, Kahn and cardiolipin reactions were negative.

Hemispherectomy. The patient was operated upon on May 5, 1955. A frontoparieto-occipital flap, divided in two portions, was raised. The dura mater was incised and after exposure of the hemisphere, the cerebral cortex was freed from adhesions. Because of the marked adhesions to the dura mater, the hemispherectomy had to be carried out by dividing the brain in four lobes. The hemostasis of the venous sinuses was very difficult, necessitating packing with oxycel and digital pressure. The basal ganglia were left intact. The dura mater was carefully closed and the bone flap was fixed by stainless steel wire. The right hemisphere was atrophied and was adherent to the dura mater in many places, specially at the level of the great veins. The patient tolerated the procedure well; it had lasted 8 hours and necessitated a transfusion of 4,300 cc. of whole blood to replace in part the blood that had been lost.

Postoperative Course. Immediately after the operation, periodic breathing developed and the patient was deeply unconscious for 28 hours. Gradually he recovered awareness but in an incomplete degree. Five days after the hemispherectomy he had his eyes widely open and spoke continually in a low unintelligible whisper while moving the right arm in all directions. He seemed grossly disoriented but when he heard the examiner sneezing he immediately said "God bless you, Doctor" in spite of the fact that he had not looked at him and did not seem aware of his presence. When asked how he felt he said, after 4 or 5 seconds, "a little better, Doctor" and answered that he complained of the head but could not specify what was wrong. In the same interview he would not answer other simple questions, which were put to him repeatedly; he closed his eyes and seemed to be asleep but several minutes later, when not interfered with, he recommenced the stereotyped movements of the right arm. The left hemiplegia was more marked but less spastic.

In the following days he was febrile, apathetic, uncommunicative. Gradually he partially recovered orientation in time and place, and 12 days after operation he