CASE REPORT

Blindness After Lumbosacral Fusion

Dr. Michael Burman of New York reports a unique and immediate complication of anesthesia and/or operation. This complication is blindness in one eye after lumbosacral fusion.

Case 1. A white man, 42 years old, had a Hibbs fusion on June 24, 1945, reinforced by a large graft of bone from the left tibia. The graft, V-shaped at each end, was interlocked into the spinous process of L_5 above and of S_2 below. The induction of anesthesia was difficult. Several attempts were made to pass an endotracheal tube without success. Anesthesia was begun at 11:25 A.M. and ended at 1.35 P.M. The operative procedure went smoothly. A compatible blood transfusion was given during the operation.

On the night of the day of the operation, the man was blind in his right eye. His vision before operation had been good.

The late Dr. James Smith examined him on June 28, 1945, and found no fundal changes. The right pupil was 0.5 mm. wider than the left. Each pupil reacted sluggishly to light. Vision of the right eye seemed to be about one-third that of the left eye. He was given 100 mg. of Vitamin B complex intramuscularly every two days. One July 5, 1945, the vision in OD was 20/50 and in OS 20/30. There was no central scotoma. When he left the hospital on August 30, 1945, he saw well and had no complaints.

Case 2. A colored man, 40 years old, underwent fusion of the low back on March 15, 1946. At antecedent laminectomy in 1940, the spinous processes of L_5, L_4, and L_3 had been resected; a herniated disc was not found. The man was given blood during the operation. The anesthesia did not include endotracheal intubation and lasted from 8:30 A.M. to 10:35 A.M. Again, the operative procedure was without apparent event. The man had no vision in his left eye when he awakened.

When Dr. Smith saw him on the day after operation, the eye grounds were diffusely gray by transudation of fluid. There was a 'cherry spot' in the macula. Vein-artery ratio was 5 to 1 the normal being 3 to 2. The man had no light perception. A diagnosis of obstruction of the central artery of the retina of the left eye was made. The right eye was normal.

By March 21, 1946, the retinal ischemia was subsiding but the arterioles were constricted to thread-like diameter. Homatropine, 1 minim of a 2 per cent solution was instilled twice a day, and an eye patch was applied. On March 28, the optic nerve head was definitely atrophic. At this time, the homatropine was discontinued. By April 4, there was extensive moth-eaten degeneration of the retina and still no light perception. There was total closure of the arteriolar system with marked narrowing of the veins. The vein-artery ratio of the left eye was 10 to 1. The pupil of the affected eye was fixed to direct light and barely reacted to the consensual light reflex. On April 16, Dr. Smith noted complete optic nerve atrophy and secondary degeneration of the avascular retina. The thread-like arterioles held no blood. The veins were narrowed to one-third of their normal diameter.

He was blind in his left eye when he left the hospital on April 24, 1946, with no change observed when he was last examined on October 26, 1948.

Sickle anemia was postulated as the cause of blindness, but there was neither anemia nor sickling of the red cells. The Kahn and Kline tests were negative. His urine showed a faint response for urobilinogen in a dilution of twenty. This finding was not pursued. Spinal tap before operation was negative; none was done after the operation.

The bone graft broke at the lumbosacral joint level and its upper end showed resorption when roentgenograms were taken on October 4, 1946, a not unusual event with a large tibial graft. The fractured graft created a new episode of back pain from which he was relieved by brace support, rest and physical therapy.

Comment. There must be cause—and not coincidence—between the events of operation and the blindness. Each of the two men underwent a Hibbs fusion operation combined with a V-shaped tibial bone graft. In each, the donor site was the left tibia.

There was no evident damage to the eyeball by mask or other direct injury, nor any sign of contusion of the face covered by the mask. (A serious postoperative complication in a patient after cervical laminectomy was thrombosis of the central retinal artery, said by Epstein and Epstein (Bull. New York Acad. Med. 35: 370, 1959) to be due to pressure on the eyeball in the prone position of operation.) In neither case was there internal carotid thrombosis, an illness in which there is loss of vision in one eye from ischemia (Roberts, Peskin, and Wood: A.M.A. Arch. Surg. 76: 483, 1958).

The answer to this puzzling blindness seems to be given by Batson's thesis (Amer. J. Roentgenol. 78: 195, 1957) of the vertebral vein sys-

tem. An embolus in the valveless vertebral vein system bypassed the body vein system and therefore the heart and lungs.

Batson and his colleague, McDonald, saw no changes in the eye grounds of a dog when 10 cc. of air were injected into a deep tail vein which is actually a vertebral vein. When the head of the anesthetized dog was lifted to become uppermost, *the retinae immediately blanched for the air moved cephalad.*

In the operation of spine fusion the posterior vertebral vein plexus may be entered. Air, inadvertently introduced, or a small blood clot, may block the terminal vessels of the retina, either temporarily by spasm or permanently. Intense venous spasm may bring on reversible or irreversible arterial spasm. In the lower limb, this spasm may be so great as to give major or minor gangrene. Waller (J.A.M.A. 165: 344, 1957) described this event in the lower extremity. Dr. Burman has seen it, too.

A study of the eye grounds immediately after laminectomy or spine fusion may reveal unsuspected retinal change.

It is to be proven that in these two patients there was direct relation between difficult induction of anesthesia and the blindness. After quiet anesthesia had been achieved,, the operation was done without noted significant change in the position of the head of either patient. It can be said that the event of blindness did occur, an event of considerable concern to both anesthesiologist and surgeon.

The cause for blindness is still uncertain. Lacking the evidence of direct pressure on the eyeball as the cause of blindness, and lacking other explanation, Batson's theses seems reasonable.

In any case, this uncommon and previously unrecorded event of blindness after this sort of lumbosacral fusion should be known.
