COMPLICATIONS INVOLVING THE OPTIC NERVES AND CHIASM DURING THE EARLY PERIOD AFTER NEUROSURGICAL OPERATIONS*

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In 1959–60 we observed 3 patients who experienced sudden loss of vision immediately following operation. This suggested to us a review of our readily available material. We eliminated cases of primary trauma, aneurysm, postoperative infection and complications originating as the result of diagnostic procedures. There remained 10 cases and for these brief summaries have been made. In 1 instance there was misadventure during the operative procedure. In several patients the preoperative symptoms and signs conformed to a generally recognized pattern. Unanticipated developments following operation in such cases provided speculation in some and consternation in others. In still other cases, unusual and complicated patterns were present prior to operation and consequently unusual features might have been anticipated to follow the procedure. In such cases uncertainty as regards prognosis is a principal problem.

There is a remarkable paucity of systematic studies on loss of vision and visual fields in the early postoperative period. Such occurrences are described occasionally in individual case reports. We have not made a survey of the anatomy including the vascular supply of the parts concerned but mention is made of important contributions. An 11th case is summarized briefly because it is relevant to the study and has intrinsic interest.

We do not have personal experience, in the circumstances in which they were described, with the postoperative complications that are reviewed below. They are generally well known and merit mention.

OCULAR COMPLICATIONS SEEMINGLY DEPENDENT UPON POSITIONING OF PATIENT

In 1937 Wolf and Siris41 reported on acute nontraumatic encephalomalacia as sometimes complicating neurosurgical procedures performed with patients in the sitting position. Three of their 4 patients were operated upon for trigeminal neuralgia and a fourth for severance of the upper posterior cervical roots. All 3 patients with tic became unconscious when the middle meningeal artery was divided. All 4 died. There was a pronounced fall in blood pressure during the operative procedure in all their cases. One of us (W.) has observed total blindness in an individual subjected to operation for acoustic neuroma performed elsewhere and in the sitting position. This individual had been able to read the paper immediately before operation and had considered his eyes to be quite normal; when he regained consciousness he was blind bilaterally and so remained. When he was seen years later there was total bilateral optic atrophy. Excepting for some deafness there was no other involvement. Unfortunately we were unable to obtain other details of his case.

Comment. The illustrations that are produced in Wolf and Siris'41 paper exemplify what we have come to understand follows cardiac arrest. The border-zone involvement described by Lindenberg25,26 is depicted perfectly in their figures. Such cases as those described by Wolf and Siris are not unique.

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Avoidance of severe hypotension during operation is now recognized as essential to avoidance of tragedy. Peet and Schneider observed dangerous hypotension as having occurred in 25 of 553 patients subjected to operation for trigeminal neuralgia with the patient in the sitting position. One of their patients died on the table and 6 survived with evidence of having suffered vascular accident; no mention was made of visual involvement in those who recovered.

Stooker and Ransohoff remarked that in 710 operations for trigeminal neuralgia, during operation a marked fall in blood pressure occurred in 19 patients (2.7 per cent) "independent of blood loss, probably related to the upright position, the preoperative medication, or possibly afferent impulses associated with manipulation of the trigeminal complex." Two of their 6 patients who died had a course similar to that described by Wolf and Siris. In 1 patient who died there was a complete left ophthalmoplegia followed in several days by spastic right hemiplegia and aphasia.

Unilateral blindness following anesthesia and dependent upon the position of the patient's head in relation to the head support was described by Hollenhorst et al. as having occurred in 8 patients in the Mayo Clinic. The patients were anesthetized in either the sitting or lying position. The loss of vision was attributed to inadvertent pressure on the involved eye. By changing the type of head rest the complication subsequently was avoided. The affected eye was found to be slightly protruded, partially ophthalmoplegic, and the pupil was dilated and fixed. Permanent unilateral blindness persisted in some and in others there was return of perception of light. The optic disc became very white and the retinal vessels were extremely narrowed.

CASE REPORTS CONCERNING LOSS OF VISION

In the case reports only what we have considered as pertinent is presented. Visual acuity when stated is corrected acuity. Field charts are omitted.

Case 1. Summary. Brief unilateral loss of vision in remaining useful eye following operative removal of suprasellar meningioma. Recovery of vision after several hours. Diabetes insipidus followed operation, disappeared, then recurred and persisted.

History. H.R. (83 22 73), a woman aged 46, in February 1956 complained of left-sided headache and loss of vision. Visual acuity was 20/15 for each eye. Optic fundi and visual fields were normal. Roentgenograms of the skull and left carotid arteriogram showed nothing remarkable. By November 1957 useful vision had been lost in the left eye and there was complaint of blurring of vision of the right eye but it could be corrected to normal. The left optic disc had become pale. The headaches continued and the patient was referred here.

Examination. General physical findings were normal. The eyes were normal externally excepting for the left pupil which was wide and non-reactive to direct light. R.E.V., 20/20. L.E.V., no light perception. The entire temporal field of the right eye was lost. The left optic disc was extremely pale; the right disc had slight temporal pallor. Roentgenograms of the skull were normal. It was suspected she had a suprasellar tumor. Left carotid arteriogram showed what was compatible with such a tumor, and this was confirmed further by a pneumoencephalogram.

Operation. Left frontal craniotomy was performed with removal of a large reddish suprasellar meningioma. It completely covered the region of the left optic nerve and carotid artery. The tumor was pulled away from the region of the right optic nerve and chiasm so that they were clearly visualized, and it was seen that the pituitary stalk had been pushed posteriorly. The left optic nerve was extremely narrowed.

Course. Upon awakening from anesthesia there was severe reduction in the visual acuity of the patient's right eye. Accurate testing was not performed. However, after 8 hours the pronounced blurring improved rapidly. Vision was 20/20 when tested a few days later. The field of the right eye remained unchanged; the left eye remained blind. For a few days she had postoperative diabetes insipidus. She was given a single injection of Pitressin and had no further trouble with diabetes insipidus for 5 months, when it recurred and persisted. Finally it was effectively regulated with Pitressin.

In February 1959, 3 years after operation, the corrected vision of the right eye remained 20/20, read .5M and the loss of temporal field for that eye was unchanged. The left eye remained blind. Diabetes insipidus was easily controlled.

Case 2. Summary. Loss of vision, total bilateral, prior to operation, persisted for 5 days after re-