

LIGATION OF THE ANTERIOR CHOROIDAL ARTERY FOR INVOLUNTARY MOVEMENTS---PARKINSONISM

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It is the purpose of this paper to report experience with a new operation aimed at the relief of involuntary movement disorders. This operation consists of ligation of the anterior choroidal artery. The rationale of this procedure lies in the fact that this blood vessel supplies most of the structures which have been attacked surgically in the attempt to relieve intractable involuntary movements. Among the structures irrigated by this vessel are the globus pallidus, ansa lenticularis, red nucleus, retrolenticular portion of the internal capsule, corpus luyisi, substantia nigra, optic tract and cerebral peduncle.

It is beyond the scope of this report to review the literature or describe the neuroanatomy or physiology of involuntary movements. Rather, it is only the purpose to call attention in a preliminary fashion to the early effects which have been noted following ligation of the anterior choroidal artery in cases of parkinsonian tremor. This operation was developed as a result of the unexpected disappearance of unilateral resting tremor in one case following the interruption and subsequent ligation of a vessel considered to be the anterior choroidal artery.

CASE REPORTS

Case 1. W. T., a 36-year-old white man, had suffered from severe parkinsonian tremor associated with most of the other known symptoms of advanced Parkinson's disease for 18 years. This had become progressively more severe from the time of onset, and for 10 years the patient had been virtually disabled. As early as 1943, he had needed assistance to get out of his chair, and was unable to perform such usual simple tasks as feeding himself, or going to the bathroom. He was admitted to Kings County (N. Y.) Hospital in 1945 because he was unable to take care of himself. He stated that he would attempt suicide but was unable to do so. He was admitted to Central Islip (N. Y.) State Hospital in 1949. He was never able to stand or walk from the time of his admission to Central Islip.

Prior to operation this patient demonstrated constant, severe, alternating-type tremor of all four extremities, worse in the upper extremities. Speech was unintelligible. He had not been able to hold a pen or pencil to write for 10 years. He was a full-time nursing problem and had to be fed, bathed, clothed, and completely managed by the nursing staff. His left anterior choroidal artery was ligated through a left frontotemporal craniotomy early in 1953. Subsequent to this operation, although motor power was unimpaired, resting tremor, rigidity, and cogwheelism disappeared completely from the right extremities. The right anterior choroidal artery was subsequently ligated by means of silver clips through a right frontotemporal craniotomy. One week following this operation, the patient could get briskly out of a chair, walk rapidly without any evidence of festination gait, speak clearly, and voluntarily write the surgeon a full page letter by his own hand. There is practically no tremor, at rest, in either of the upper extremities. There is moderate tremor during excitement or emotional duress. Rigidity and cogwheelism are absent from all four extremities. Speech has become intelligible. The patient can feed himself, clothe himself, hold and drink a glass of water without difficulty, and attend to his excretory functions alone and unaided for the first time in more than 10 years. This improvement appears to be progressive to date. However, long-term results must await further observation.

Case 2. P. W., a 38-year-old white man, suffered a known attack of encephalitis at the age of 20. Shortly thereafter, he had the onset of typical postencephalitic parkinsonism. He had progressively more severe tremors, involving both upper extremities, oculogyric crises, and festination gait. Rigidity of all extremities was marked. The tremor became so severe as to require constant nursing care. Therefore, the patient was admitted to Central Islip State Hospital in 1944. His diagnosis at that time was postencephalitic parkinsonism and mental deficiency.

Early in 1953 the right anterior choroidal artery was ligated by means of silver clips through a right frontotemporal craniotomy. Since immediately following the operation, there has been an absence of rigidity and cogwheelism on the left. Resting tremor in the left extremities has been almost completely absent. The tremors return to a moderate degree during excitement. The tremors,

rigidity and cogwheelism of the right extremities have persisted. Motor power of the left extremities has improved as compared with the preoperative state.

Besides these two cases, which are cited very briefly and without detailed description, six additional ligations of the anterior choroidal artery have been performed. The early results obtained in all these cases have paralleled the postoperative findings cited in the foregoing. That is, following ligation of the anterior choroidal artery, there have been noted: marked diminution of contralateral tremor, disappearance of cogwheelism and rigidity from the contralateral extremities, and improved motor power in the contralateral extremities. The writer has not noted any instances of hemiplegia or hemianesthesia. Gross confrontation testing has not revealed visual field defects. Detailed visual field studies are in progress.

For the sake of brevity, many significant details have been omitted from this brief report. It has been the writer's purpose only to point out that surgical occlusion of the anterior choroidal artery can be accomplished safely and with apparently significant clinical and neurophysiologic results.

SUMMARY

Two cases of ligation of the anterior choroidal artery have been reported to illustrate the writer's investigative use of this operation. He has found, following ligation of the anterior choroidal artery, in cases of parkinsonism, a diminution or relief of the typical resting tremor in the contralateral extremities. He has not noted any instances of hemiplegia or hemianesthesia following this operation.

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