THE TORKILDSEN PROCEDURE
A REPORT OF 19 CASES

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(Received for publication November 13, 1947)

Some ten years have elapsed since Torkildsen performed his new palliative operation for by-passing Sylvian aqueductal obstruction. On September 9, 1937,24 he carried out a ventriculocisternostomy on a 36-year-old man with an inoperable occlusive lesion of the aqueduct of Sylvius. This release of the acquired hydrocephalus was accomplished by inserting one end of a rubber catheter into the posterior horn of the lateral ventricle and carrying the tube beneath the scalp, over the lateral sinus, and suturing its distal end into the cisterna magna. While this operation has been liberally adopted by neurosurgeons, their results and experiences with few exceptions have not been reported in the literature. The authors’ experiences in 19 cases suggested that the procedure in certain types of aqueductal obstruction is most effective, that in certain other instances it may be helpful and in some cases it would appear that it was neither indicated nor helpful. In evaluating this procedure properly it is necessary to refer to shunting operations in vogue prior to Torkildsen's contribution and to give credit to Hyndman’s12 later employment of the choroid plexus as a method of treating hydrocephalus. This delving into the previous and subsequent surgical procedures that have had as their goal a release of cerebral ventricular hypertension found us involved in the etiologies of Sylvian aqueductal obstruction. A historical review of the procedures designed to release a ventricular hydrocephalus, Torkildsen’s original and subsequent contributions,25,26,27 the results, conclusions and ideas of the essayists gained from a study of their personal experiences in this shunting operation are to be set forth. It is calculated that if the pooled results of neurosurgeons using this procedure were collected, the evaluation of the operation would be more effective. Like Cushing’s recommendation in 192519 regarding the problem of subdural hematomas, the suggestion is a good one but it will likely remain that individual experiences and not collective case reports will write the history of the score of shunting operations.

At the Eighth Congress of Scandinavian Neurologists (1938) Torkildsen24 reviewed the postoperative results in his 3 cases—2 of aqueductal neoplastic occlusion and 1 of a third ventricle glioma. In all 3 there was complete relief of pressure symptoms without untoward surgical complications.

* Presented at the meeting of the Harvey Cushing Society, November 13, 1947, Hot Springs, Virginia.
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Four additional cases had been added by 1941,27 of tumors of the third ventricle, 1 of a pinealoma, and 1 of an acquired obstructive hydrocephalus of undetermined origin. These seven cases constitute the largest postoperative study yet reported. In 1941 all patients were alive, free from symptoms and working except the original one, who died 6 months after operation of a midbrain glioma. Of the 6 living, 5 had been followed 2 to 4 years subsequent to suboccipital decompression, short-circuiting the spinal fluid, and X-ray treatment in Cases 3 and 6.

Penfield17 in 1942 reported a case of infiltrating glioma of the posterior part of the third ventricle arising from the right thalamus with relief of pressure symptoms following a Torkildsen procedure. A follow-up study was not reported. During the shunting procedure Penfield manipulated the patient’s head in all possible directions to determine the effects of this movement on the catheter. Since the tube is entirely above the highest movable joint, no disturbance of the tube occurred with any head motions. This led to the suggestion that a flexible metal tube could be used in lieu of the rubber catheter. Although pathological studies of the sinus tracts produced by a rubber catheter reveal only a fine smooth, collagenic rim in the wall of the sinus with minimal gliosis in the chronic cases, in more acute cases there are variably sized collections of lymphocytes and polymorphonuclear cells in the neighborhood of the tract. In our Case 15, in which a histologic examination was made 5 days after the catheter had been sutured in place, masses of neutrophilic invasion and early glial proliferation were dominant. Although laboratory cultures and microscopic studies of smears were negative for any organism in this case, it was our suspicion that infection was present. In another of our cases, autopsy was performed 12 months after the rubber tube ventriculocisternostomy, and only gliotic activity was evident histologically.

In 1944, Oldberg15 reported roentgenographic evidence of relief of chronically increased intracranial pressure following a Torkildsen operation. The patient was a 19-year-old girl, and at the time of this report she had been relieved of her ventricular hypertension for a period of 21 months. The etiology was an atresia of the aqueduct of Sylvius. Follow-up films of the skull depicted a complete recalcification of the pressure digital markings and a recession of the suture line separations. Wilson29 found this same radiologic change in 1 of his cases, and we have been able to verify it in 2 of our cases (1 and 2). Another objective sign of decreased ventricular hypertension following ventriculocisternostomy was observed in our Case 13. This patient on follow-up air studies revealed a reduction in the size of the ventricles (Fig. 1). Shenkin32 reported a ventricular size reduction following simple external decompression. His case was one of supratentorial ventricular enlargement, the result of a third ventricle tumor.

Wilson30 published 4 cases in 1946. The patients were all alive and well 6 months to 4 years after a Torkildsen procedure. The nature of the lesion in 3 cases was unknown but presumably involved the region of the aqueduct.