MASSIVE SUBDURAL HYDROMA COMPLICATING TORKILDSEN PROCEDURE FOR POSTERIOR THIRD VENTRICLE OR PINEAL TUMOR*

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A 41-year-old white male with a high degree of choked disc bilaterally was found by ventriculography to have a tumor of the posterior part of the 3rd ventricle or the pineal body. A Torkildsen procedure was carried out and postoperative roentgen-ray therapy was given. The patient did well for 6 weeks thereafter, when headache, vomiting and marked irrationality developed. Approximately 7 weeks after the Torkildsen procedure, an enormous right-sided subdural hydroma was found and drained with a subdural catheter in the right frontal region. There was immediate relief of the disabling clinical syndrome including the subsidence of 2–3 diop ters of choked disc bilaterally. He has remained well to date, 15 months after the last operation.†

This serious postoperative complication of the Torkildsen procedure, namely a massive surgically important subdural hydroma on the same side as the shunt operation, is new in our experience and is discussed with particular reference to the mechanism of its formation and its surgical relief.

CASE REPORT

E.L.W., white male, aged 41, was admitted to the Medical College of Virginia Hospital on Dec. 8, 1955. He complained of severe headache and was found to have bilateral choked disc of 4–5 D. He was of Polish extraction and his history was rather vague and inaccurate because of difficulty in language. Headache had largely subsided on Dec. 9, 1955, and the patient was anxious to return home. It was with difficulty that a ventriculogram was agreed upon. The neurological findings were normal except for the definite degree of choked discs. Examination by an ophthalmologist, Dr. E. W. Perkins, revealed no hemianopsia and normal acuity with bilateral enlarged blind spot. In July, 1955 the patient had had measles, at which time his headaches began, and it was thought temporarily that possibly he had an optic neuritis incident to the measles.

1st Operation. Ventriculography on Dec. 13, 1955, showed enormous lateral ventricles (124 cc. of fluid under pressure were removed from one lateral ventricle and a slightly less amount of air was introduced). The films revealed a mass either of the posterior part of the 3rd ventricle or of the pineal body. The posterior fossa was immediately entered through a vertical midline incision and a standard Torkildsen shunt was carried out on the right side.

Course. The patient did very well thereafter, the choked disc subsided promptly, and he was given roentgen-ray therapy. [In the following months the patient received three series of roentgen-ray treatments and by October, 1956, 10 months after the Torkildsen procedure, a total of 9,000 roentgen units (tumor dosage) had been delivered to the tumor.] The ventricular fluid Wassermann was negative, the protein being only 5 mg. per cent, with 1 cell. Floculation test of the blood for syphilis was also negative.

The patient was discharged from the hospital on Jan. 3, 1956, his discharge having been

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delayed somewhat by the roentgen-ray therapy. He was in good condition, with marked recession of the choked discs. He then did well for several weeks but because of a markedly irrational behavior, severe headaches, during which he held his head and moaned, and restlessness, he was admitted to Johnston-Willis Hospital, Richmond, Virginia, on Feb. 9, 1956. He had, at that time, 2-3 D. of choked disc bilaterally and because of the rather disturbing clinical syndrome, which seemed to be acute and urgent, it was determined to make frontal burr openings primarily to tap the lateral ventricles as a therapeutic measure when further roentgen-ray treatment was to be given, as it was thought that he probably had again a high degree of increased intracranial pressure with internal hydrocephalus.

2nd Operation, Feb. 11, 1956. Much to our surprise, when an anterior frontal burr opening was made on the right side, an enormous subdural hydroma was immediately encountered, the cerebral cortex and the overlying arachnoid being several centimeters from the under surface of the dura mater, so that the cortex could scarcely be visualized even when the dura mater was opened somewhat to aid removal of the fluid and the insertion of the subdural catheter (Fig. 1). The lateral ventricle on the left side also was tapped through a left frontal burr opening, the brain there being merely slack in appearance under the dura mater and the left lateral ventricle was found to be also very large. The subdural hydroma overlying the right cerebral hemisphere easily measured 80 cc. in volume.

Postoperative Course. The patient improved rapidly. A progress note on Feb. 12, 1956,
the day after surgery, stated that he was doing well; the dressings were wet with cerebrospinal fluid, especially noticeable when he coughed or cleared his throat as the uncovered protruding catheter was observed. His temperature, pulse and respiration were normal and he was alert without any headache and was also entirely rational.

On Feb. 14, 1956, the head was dressed, the dressings still being wet, and the drain was permitted to remain in position. On February 15, the subdural catheter was removed, and two interrupted black silk sutures were placed in the scalp to stop effectively the leak of fluid. He was kept on antibiotics during the time of drainage of the subdural hydroma. The patient’s condition was excellent at all times after surgery. He did not remember having been admitted to the hospital on Feb. 9, 1956.

On Feb. 16, 1956, 24 hours after the subdural catheter had been removed, the head dressing remained dry. The pupils were equal, he could count fingers accurately with each eye and the visual fields grossly were full and wide. He still had, however, about 2 D. of choked discs at this time. He was alert and rational, moved all of his extremities equally well, was ambulatory, and his temperature was normal.

On February 21, the day of discharge (all the scalp sutures having been removed), the incisions were well healed per primam. The optic disc margins were beginning to come into view with perhaps \( \frac{1}{2} \) D. elevation at most. The temperature was normal and he was ambulatory about the ward.

**Laboratory Studies.** On admission the patient had 4.85 million red blood cells per c.mm., 12.5 gm. of hemoglobin (85 per cent), and 7,800 white blood cells per c.mm., with 78 per cent polymorphonuclear cells. The ventricular fluid from the left anterior horn on February 11 showed only 1 lymphocyte and 12 mg. per cent of protein; Kolmer reaction was negative. Unfortunately, the clear, colorless subdural fluid (hydroma) evacuated at this operation was not examined in the laboratory. His blood pressure varied from 150/90 to 102/64 during his hospital stay. Roentgenograms of the skull on Feb. 17, 1956, showed only the Torkildsen tube in normal position on the right side and evidence of the suboccipital decompression on the right side that had been done in December, 1955, at the time of the initial surgery (Torkildsen procedure).

**Subsequent Course.** On March 3, 1956, the patient returned to the office. His general condition was excellent. The operative wounds were well healed, there was no headache, he was ambulatory, the optic discs were slightly hazy without measurable choking, and he had no subjective complaints of any kind, approximately 3 weeks after drainage of the hydroma.

He has been seen on several occasions since that time, the last examination being on May 17, 1957 (15 months after drainage of the subdural hydroma and 17 months after the original Torkildsen procedure) when he was doing his regular work in the mill where he was employed. The optic discs showed no choking, he had no headache, diplopia, ataxia, or syncope, or subjective complaint of any kind, and apparently the Torkildsen tube is working well. From the objective standpoint, no abnormality could be demonstrated neurologically except for moderate nystagmus on far lateral gaze, bilaterally.*

**COMMENT**

This case represents a postoperative complication that we had not seen in our clinic before; namely, a massive subdural hydroma of surgical importance on the same side as the Torkildsen tube which came on in less than 2 months after the Torkildsen procedure was performed for a pineal tumor or a mass in the posterior part of the 3rd ventricle. In trying to determine the pathologic physiology accounting for this lesion one can think only that the Torkildsen tube acted not only as planned, i.e. to short-circuit ventricular fluid around the posterior part of the 3rd ventricle and the pineal region (the site of the tumor) into the cisterna magna,

* This paragraph was added (May, 1957) subsequent to the reading of the paper in order to supply a considerably longer follow-up report.
but also the tube may have functioned as a wick allowing ventricular fluid in a "relaxed" brain on the right side to well up around the catheter into the subdural (extra-arachnoid) space in large amounts. Thus the cerebral hemisphere on the right side became markedly compressed by the time of drainage of the subdural hydroma, approximately 2 months after the Torkildsen procedure. One wonders also why the subdural hydroma did not refill again shortly thereafter as the same conditions with the Torkildsen catheter in situ still prevail at the present time. However, it has now been 15 months since the drainage of the subdural hydroma and the patient is in normal condition, working regularly at his occupation in a paper mill with no evidence of the disturbing clinical syndrome that he had when the hydroma was drained.* Probably the brain (right cerebral hemisphere, especially) has re-expanded to some extent and the opening in the cerebral hemisphere has so sealed off that now the Torkildsen tube is carrying out only its desired function of draining fluid from the lateral ventricular system directly to the cisterna magna. Presumably, also, the midbrain tumor was extremely radiosensitive, allowing the ventricular block to be relieved at an early date; this would also facilitate, perhaps, the formation of the subdural hydroma.

SUMMARY

A case is presented of a patient with a presumed neoplasm of the posterior part of the 3rd ventricle or pineal body (verified by ventriculography) who initially responded well to a Torkildsen procedure and roentgen-ray treatment. Later a large, subdural hydroma developed over the right cerebral hemisphere with very disturbing symptoms relieved completely to date by simple catheter drainage of the hydroma. The apparent mechanism of formation of this complication is briefly discussed.

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