EXPERIENCES WITH HYPOPHYSECTOMY IN MAN*

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The present investigation concerns the effect of removal of the pituitary gland in some conditions in which it was thought probable that hypophysectomy might favorably influence the future course of the primary disease.

From a clinical point of view there are three important questions connected with hypophysectomy in man: the rationale of the operation, our possibilities of judging of the completeness of the operation, and the pre- and postoperative treatment of the patient. These points will be discussed briefly, and a more detailed report will be given of the surgical procedure.

Hypophysectomy was performed in the following conditions:

1) Cushing’s syndrome, when there was no improvement after irradiation of the pituitary region, or if after a period of improvement the patient had become resistant to further irradiation.

2) Malignant hypertension—severe, with grade 4 eyeground changes. Sympathectomy in these cases rarely gives even temporary relief. An intact pituitary-adrenal system is a prerequisite for the genesis of experimental essential hypertension, and hypophysectomy eliminates the condition. In clinical cases of hypertension the blood pressure has been lowered after damage to the pituitary or the adrenals. Administration of DCA to these patients made the hypertension reappear.

3) Diabetes mellitus—severe, with diabetic retinopathy and chronic renal disease, when proper treatment with an adequate dose of insulin did not stop the progress of the vascular changes. It has been suggested that this type of diabetes might involve the hypophysis-adrenal cortex to a greater degree.

4) Carcinomas of the breast and of the prostate gland. These tumors sometimes react favorably to changes in the hormonal milieu brought about by castration, treatment with certain hormones, and—as has been shown lately—by adrenalectomy. The effect of the hormone treatment in these cases has been ascribed to a depressing action on the hormone production of the pituitary.

We also had in mind some other malignant tumors as possibly being responsive to the change in the hormonal milieu brought about by hypophysectomy: chorionepitheliomas and malignant melanomas.

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Our first results were published in March 1952. In 1936 Elden reported a case in which the pituitary gland had been destroyed by electrocoagulation by Van Wagenen. Part of the pituitary gland was still present at the autopsy. The patient had presented the clinical picture of Simmonds’ disease. Chabanier et al. in 1936 reported on hypophysectomy in a case of severe diabetes mellitus. After removal of the pituitary gland the diabetes could be reasonably well controlled. There was no autopsy in this case. From the fact that the patient after operation required as much as 70–80 units of insulin per day, we are inclined to believe that functioning pituitary tissue was still present. In 1952 Perrault briefly reported on a case of carcinoma of the breast with pulmonary metastases, in which hypophysectomy had been performed 2 months earlier by Le Beau. This resulted in improvement of the general condition of the patient and increase in weight. The fact that the adrenalin test was normal in our opinion makes it probable that the hypophysectomy was incomplete. In 1952 Naffziger and collaborators reported the result of hypophysectomy in a case of malignant melanoma. The patient died 2 months after operation from progress of the malignant condition. There was still a minimal rest of pituitary cells lining the dural covering of the pituitary fossa.

SURGICAL PROCEDURE

The hypophysis is surrounded by a rich system of blood vessels. It is imbedded in a large dural sinus (Fig. 1), which forms a ring in the periphery of the diaphragm of the sella. Also, the dural lining of the sella is highly vascularized. These veins are not particularly large but communicate freely with the cavernous sinus on both sides, and a tear in any of these veins is apt to lead to profuse hemorrhage. Moreover, the lateral walls of the pituitary fossa are for a part identical with the lining of the cavernous sinus, which

Fig. 1. Section of pituitary gland in situ showing relation to adjacent blood vessels.