ANAESTHESIA FOR TRANSSPHENOIDAL HYPOPHYSECTOMY*

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THE PROBLEMS OF anaesthesia for hypophysectomy depend on the surgical procedure carried out. The intracranial subfrontal approach is the surgical technique most generally employed by neurosurgeons and the main problem encountered by the anaesthetist is oedema of the brain. It is worth while to mention that causes conducive to reactive tissue swelling and productive of the clinical complications of cerebral oedema are various, including disconnection of venous drainage followed by elevation of the frontal lobe, subarachnoid oozing of blood, ischaemia of the nervous tissue secondary to long standing retraction. We must remind ourselves that these events can be in part prevented by using accessory methods which increase the intracranial chamber by reducing the brain volume, such as lumbar drainage of the CSF and ventricular puncture and aspiration of the fluid from the ventricle. In some cases of pituitary tumour with suprasellar extension, hypothermia is utilized for damping the vegetative reactions of hypothalamic origin. When, for particular reasons, hypotension is demanded by the surgeon, he should always be warned that the slightest pressure applied to the brain tissue by an instrument is liable to produce severe contusion and even an infarct of the whole frontal lobe.¹ Coughing, vomiting, anoxia, elevation of blood pressure, and embarrassment of the jugular venous drainage are some other causes which increase the risk of postoperative brain oedema. In spite of all the precautions there are still unknown causes which can produce cerebral complications in the field of surgery of the hypophysis.

Before the intracranial approach was introduced by Cushing² the surgical approach for removal of pituitary tumours was from below through the sphenoidal sinus. A tumour of the hypophysis was successfully removed thus from below first by Schloffer in 1907. This operation was received with enthusiasm by many, such as Oscar Hirsch of Vienna.³ When intracranial surgery became popular, the transsphenoidal route was virtually abandoned and almost forgotten. However, this method is still currently employed by well-recognized European neurosurgeons. Norman Dott in Edinburgh, Guiot in Paris,⁴ and Norleen in Sweden. In our country, no mention is made in the literature that this operation was ever performed. It was introduced in our hospital by Hardy.⁵ The transsphenoidal approach to the sella turcica was performed in 8 cases of hypophysectomy for advanced metastatic cancer of the breast and 10 cases of suprasellar tumours.

We had the opportunity to carry out the anaesthesia in all of these 18 cases, and, therefore, we believe it should be of interest to describe the particular problems involved in this operation from the standpoint of anaesthesia.

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The age of the patients varied from 18 to 61. The time of surgical procedure itself varied from 20 minutes for simple radioactive hypophysectomy with yttrium implantation to 3 hours for some cases of pituitary tumours. There was no operative mortality. No major complications arose during the operation or in the immediate postoperative follow-up period. From the point of view of the anaesthetist, this operation can be considered in practice as an extracranial procedure. All risks of complications usually feared from intracranial operations are eliminated. It is a rather benign operation comparable with submucosal resection of the nasal septum or plastic surgery of the nose.

The anaesthetic induction was with thiopental (2½ per cent) followed by succinylcholine bromide and ventilation for one minute with 100 per cent oxygen, then endotracheal intubation was done with a non-kinking tube. Maintenance of anaesthesia was with halothane for 4 cases of our series and methoxyflurane for 3 cases. When epinephrine was added to the local anaesthetic, maintenance of anaesthesia was with meperidine and succinylcholine drip for 9 cases and a neuroleptic for 2 cases.

The patient is placed in a semi-seated position on the operating table, with the head lying on the special head rest and slightly turned towards the surgeon. Since the only incision is done beneath the upper lip in the gingivolabial groove, some blood might get into the mouth. Therefore, it is advisable to use an orotracheal tube with an inflated cuff and also to pack the oropharyngeal cavity with a sponge. In our department this operation is carried out under radiofluoroscopic control with an image intensifier monitored on a television screen. Explosive agents are contraindicated because of the high-voltage currents used. Because the patient's head is surrounded by X-ray tube and image intensifier under the drapes, access to it is impossible for accurate observation of respiration and pupillary reflexes. We prefer to assist or control the respiration by hand in order to evaluate more accurately the depth of anaesthesia. In 2 cases, which were on mechanical control of respiration, we had some transitory difficulty.

All cases of pituitary tumour removal were uneventful from the anaesthetic point of view at the time of the extirpation. In 2 cases of hypophysectomy of the normal pituitary for carcinoma of the breast, the blood pressure fell 20 mm Hg in one, and 60 mm Hg in the other at the time of the surgical extirpation of the hypophysis, but was promptly restored to normal by intravenous injection of methoxamine.

All cases had received cortisone acetate 100 mg intramuscularly the night before operation, 50 mg the morning of the operation, and were supported with intravenous hydrocortisone 100 mg during the operation.

SUMMARY

Intracranial subfrontal hypophysectomy is a serious procedure associated with some difficult problems of anaesthesia. The most important one is to prevent cerebral oedema caused by retraction of the frontal lobe for a long time.

On the other hand, surgery of the normal or tumoural hypophysis carried out by the transsphenoidal approach appears to be a safe technique that gives rise

to no serious problems of anaesthesia. Some particular points are reported on the basis of our experience in a series of 18 cases.

RÉSUMÉ

L'hypophysectomie par voie intracrânienne sous-frontale entraîne des problèmes anesthésiques. Le plus difficile à solutionner est celui de l'œdème ou de la turgescence cérébrale.

Par voie nasale ou extra-crânienne (trans-sphénoïdale) le problème du gonflement du cerveau ne se pose plus et les difficultés anesthésiques sont réduites au minimum.

Dix-huit patients opérés par voie nasale (10 pour tumeur de la selle turcique et 8 pour hypophysectomie simple) nous ont permis récemment de préciser la technique anesthésique, de constater la simplicité de la méthode et l'excellence des résultats.

REFERENCES

1. DOTT, N., BAILEY, P., & CUSHING, H. *Brit J Surg* 13: 314 (1925-26)
2. CUSHING, H. *Trans Am Surg Assoc* 31: 467 (1913), *JAMA* 76: 172 (1921)
3. HIRSCH, O. *Wien Med Wschr* 64: 1519 (1914), *JAMA* 55: 772 (1910)
4. GUIOT, G., *et al* *Adénomes hypophysaires* Paris: Masson (1958)
5. HARDY, J. *L'Exérèse des adénomes hypophysaires par voie trans-sphénoïdale* *L'Union Méd Canada* 91: 933 (1962)