Removal of Certain Hypophyseal Tumors by the Transantral-Sphenoid Route

HENDRIK J. SVIEN, M.D., AND THADDEUS J. LITZOW, M.D.
Sections of Neurologic Surgery and Plastic Surgery, Mayo Clinic and Mayo Foundation, Rochester, Minnesota

In a previous publication on pituitary adenomas, it was pointed out that the postoperative mortality and morbidity were greater and the visual improvement less when the sella turcica was "excessively enlarged" than when the sella was only moderately enlarged. The sella was arbitrarily considered to be "excessively enlarged" if it exceeded 2.2 cm. in the anteroposterior diameter and 1.7 cm. in depth. The mortality rate for patients having such enlargement of the sella was 16.7 per cent, while for other patients it was 2.5 per cent. Extrasellar extension of the tumor, a factor which results in increased mortality, was present in about the same frequency in both groups of patients. Morbidity, as measured by the number of days in hospital and by the incidence of wound reopening, was significantly greater in the group of patients with "excessively enlarged" sellae. Vision was improved after operation in 44.8 per cent of cases in this group; in contrast, improvement occurred in 62.8 per cent of patients having only moderate sellar enlargement. At the time of the last follow-up examination, from 1 to 7 years postoperatively, 34.5 per cent of patients having large tumors had vision which was worse by at least 5 per cent, because of recurrence of the tumor or operative injury to the optic apparatus or its blood supply. For patients in the group with moderate sellar enlargement, the comparable figure was 11.4 per cent.

A transfrontal approach had been used for all patients treated surgically in the study just summarized. The results led us to investigate the trans-sphenoid route for removal of pituitary tumors associated with excessively enlarged sellae. Cushing employed the trans-septal-sphenoid approach for all pituitary tumors at the outset of his career, but later he expressed preference for the transfrontal route. Hirsch has continued to employ the trans-sphenoid approach to the present day, and Hamlin has followed him in this regard. During the past decade the trans-sphenoidal approach with or without modifications has been employed for hypophyseal tumors by British, French, and Scandinavian surgeons. Dott favors this approach for most hypophyseal tumors; as do Guiot and Thibaut; Deborsu reported its use in 80 cases. Hamberger et al. have modified the usual transnasal route, employing the Caldwell-Luck approach to the maxillary antrum, and proceeding thence to the sphenoid sinus.

Clinical Materials and Methods

This report concerns 10 patients with enlarged sellae who have been operated on by the approach to be described and who have been followed for at least 1½ years. Six of these patients had pituitary tumors (4, chromophobe adenomas and 2, acidophilic adenomas); 1 patient had a tumor confined to the enlarged sella that was almost entirely cystic and was considered pathologically to be craniopharyngioma; 2 patients had chordomas involving the sella; and 1 patient had a metastatic grade 4 carcinoma which eroded the sella and invaded the sphenoid sinus.

Five of the 6 patients with pituitary tumors and the patient with the craniopharyngioma had visual field defects. One of the 2 patients with acromegaly had no field defect, but had clinical signs and laboratory findings of progressing acromegaly despite a course of irradiation therapy.

Operative Technique. The approach that we have employed consists of lateral rhinotomy, entrance into the nasal cavity and adjacent maxillary antrum, and exposure of the sella through the sphenoid sinus.

Received for publication January 26, 1965.
Revision received May 21, 1965.
The patient is placed in the horizontal supine position and anesthetized. An oral endotracheal tube is passed and, when in its proper position, is anchored in place by a wire which is led around the tube and secured to one of the lower bicuspids teeth. The hairs of the nostril are cut with scissors and both nasal cavities are then packed with cotton impregnated with a solution of 10 per cent cocaine. The skin of the face is washed with soap and water for 5 minutes and prepared with a 75 per cent solution of isopropyl alcohol. Head towels are applied, leaving the nose and the eye exposed on the side of the rhinotomy.

The position of the skin incisions is marked with an indelible pencil (Fig. 1), and the region is infiltrated with a solution of piperocaine (Metycaine), 1½ per cent, and adrenalin, 1:1000. After the skin is incised, the incision on the nose is deepened to divide the soft tissues of the nose from those of the cheek until the lower border of the nasal bone is exposed. With a chisel and mallet, the nasal bone is divided along the naso-

maxillary suture line and elevated upward and medially. This permits the mobilized side of the nose to be reflected medially to expose the nasal cavity (Fig. 2). The soft tissues of the cheek are also reflected from the maxilla, exposing the rim of the pyriform fossa and the anterior wall of the maxillary sinus. The infraorbital neurovascular bundle is exposed and left intact.

The middle and inferior turbinates on the side of the approach are removed, and the mucosa of the lateral wall of the nasal cavity is reflected from its bony attachment and removed. The lateral bony wall of the nasal cavity is then removed, converting the nasal cavity and maxillary sinus on the operative side into a single large cavity (Fig. 3). The confluence of these 2 cavities provides excel-

Fig. 1. Line of incision has been drawn with indelible pencil.

Fig. 2. Nose has been reflected to expose the nasal cavity.

Fig. 3. Sketch shows partial removal of the anterior wall of maxillary sinus and lateral wall of nasal cavity to afford confluence of these cavities.

Fig. 4. Removal of posterior third of nasal septum provides access to both sphenoid sinuses.

Fig. 8. Sketch shows partial removal of the anterior wall of maxillary sinus and lateral wall of nasal cavity to afford confluence of these cavities.