Anatomic Bases of Medical and Surgical Techniques

Anatomical Bases for the Transphenoidal Approach to the Pituitary Gland

F Grisoli, F Vincentelli, JF Henry, and JM Thomassin

Summary. The anatomical and surgical problems of the transphenoidal approach to the pituitary gland are described in relation to 116 autopsy studies and more than 300 surgical operations.

The variations in bony structure and softer parts were studied at each operation.

Key words: Pituitary gland – Sella turcica – Transphenoidal approach

Transphenoidal approach to the pituitary gland was first attempted in Austria, in 1907, by Schloffer. It has since been adopted by numerous neurosurgeons including Cushing, who used this approach in 75% of the 338 hypophyseal tumors referred to him for treatment. The operative mortality of Cushing’s series was exceedingly low for the period (5.8%); but the frequency of meningitis and relapse over a 5 year period (35%) meant that most specialists went back to the classical frontal approach described by Horsley in 1889 (Fig. 1). However, since 1950, the transphenoidal approach has once again become popular thanks to the introduction of the light multiplier (Guiot) and of the operating microscope (Hardy). Nowadays, the transphenoidal approach is the one preferred by most neurosurgeons, the intracranial approach being reserved for certain subfrontal, subtemporal or retroclinoid extensions and for certain ‘hourglass’ tumors (Fig. 2). There are many advantages to the transphenoidal approach. Penetration of the superior air cells may at first sight seem to invite...


infection because it involves opening the dura-mater. However, intrasellar surgery remains outwith the arachnoid and thus post-operative meningitis is exceptionally rare. The use of a light multiplier allows the extraction of even large tumors with suprasellar extension since it permits permanent control of the position of curettes during the operation. The mortality is accordingly in the region of 1% and considerably lower than that associated with the frontal approach. The operating microscope makes a differentiation between normal and pathological tissue possible and thus enables a surgeon to perform a ‘selective tumor-ectomy’.

The present study is based on classical anatomical methods and on the results of surgical operations. The ethmoidosphenoidal region was removed en bloc from 116 cadavers in order to have it photographed, radiographed, injected and dissected. An experience of over 300 operations on the pituitary gland using the transphenoidal approach has enabled us to check on the classical description and to emphasize certain points of surgical interest. The structures discussed in this article are placed in the order in which the surgeon comes across them and include: the max-