



Advances in the Diagnosis and Management of Pituitary Tumors

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Editorial

At Harvard Medical School, there has been a long-standing interest in lesions of the pituitary gland. At the Brigham and Women's Hospital, we are fortunate to have a multidisciplinary group focused on this subject. Our colleagues in pathology play a pivotal role in the design and execution of our research efforts. As additional knowledge regarding genetic and molecular advances in the diagnosis of pituitary lesions, we are moving steadily toward an integrated diagnosis. As with other brain tumors, this includes taking into account the patient's history, laboratory studies (particularly of pituitary hormones), imaging studies, and the details of surgical findings. Each pituitary tumor is analyzed by immunocytochemistry, staining for the various hormones produced by the pituitary gland. Along with the histologic characteristics of the tumor, which include mitoses, inclusions, reticulin pattern, pleomorphism and vascular features, the proliferation status is now routinely measured using MIB-1. These data, collected in a systematic fashion, provide the substrate for clinical pathological correlation, and the assessment of pituitary function and hormonal status on follow-up. Additional staining is often utilized when unusual lesions are contemplated.

Presently, a significant proportion of our patient material is subjected to oncogene analysis, and frozen samples are available for further molecular and genetic studies [1]. Preoperative characterization of pituitary tumors by their imaging features is an important part of the integrated diagnosis. We classify the tumors by size and extent as microadenomas, macroadenomas and giant adenomas. Imaging features of tumor invasion of surrounding structures such as the cavernous sinus are noted. Suprasellar extension and parasellar extension are also taken into account in the classification and stratification of these lesions. New developments in MR imaging such as the use of 7 T magnets, MALDI mass spectroscopy [2], along with ultrasonic imaging and nuclear imaging with 60Ga-DOTATATE PET-CT are anticipated, and hope to provide even more precision in localization and diagnosis of neuroendocrine and pituitary tumors.

Although surgery to remove pituitary tumors still provides the most rapid and successful method of therapy when an ACTH secreting tumor is discovered and removed, currently, the surgical success rate is imperfect, and recurrence rates are high even when such a tumor is removed. For that reason, new methods of medical management are under development and undergoing clinical trials. Thus far the strategies have not been curative, but do provide relief from symptoms and signs in many patients. We are optimistic that the findings of research on these difficult lesions will lead to more successful management in the future.

Our multidisciplinary group includes pathologists, neuroradiologists, endocrinologists, neurosurgeons, neuro-oncologists, radiation oncologists, and clinical trials and nursing colleagues. On a monthly basis, the group meets around of multi-head microscope to discuss in detail one particularly interesting pituitary case from every possible aspect. Additionally, on a monthly basis, there is a broader conference in the pathology conference room where 4-5 cases are presented with clinical details, imaging findings, operative findings with videos of the operative procedure, and pathologic findings. These educational efforts enhance the collegiality of our group, and hopefully will lead to better treatment for patients with Cushing's disease and other challenging endocrine syndromes related to the pituitary and the neoplasms and other disorders that affect this fascinating structure.

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