Commentary
Volume 5:32021

Journal of
Clinical Research

Open Access

A Commentary on Neuropathology of Pituitary Adenomas and Sellar Lesions

Peter J Kobalka

Department of Pathology and Laboratory Medicine, The Ohio State University Medical Center, Columbus, United States

Description

The pituitary gland can give rise to varied pathological processes, both neoplastic and inflammatory [1]. Among these, the vast majority of tumors are pituitary neuroendocrine neoplasms (Pit NETs), originating from the anterior pituitary lobe [2]. Proper classification and evaluation of these neoplasms is essential to provide proper patient management. Historically, classification relied on rather arbitrary stratification based on differences in staining with H&E [3]. Immunohistochemistry assay staining for pituitary hormones is now fundamental in elucidating the nature of these neoplasms, as well as newer transcription factor markers [2,4-9]. Transcription factors illuminate cell lineage into acidophilic lineage (somatotrophs, lactotrophs, thyrotrophs), corticotroph lineage, and gonadotroph lineage [4], in cases where no hormone staining/ hormone excess is present (i.e., hitherto "null cell adenomas"). The clinical imperativeness of these stratifications is illustrated by certain adenoma subtypes behaving more aggressively by their very nature, including lactotroph adeonomas (in men) and plurihormonal PIT-1 positive adenomas (previously called silent subtype 3 adenoma) [4]. Tumor invasion and elevated Ki-67 proliferation indices are also predictive of worse clinical outcomes, regardless of adenoma subtype [4,10,11]. Aggressive adenomas over time may progress to the rare but deadly pituitary carcinoma, resistant to conventional treatment modalities, defined by distant systemic metastases or noncontiguous spread of tumor cells within the Central Nervous System (CNS) [2,3,12,13].

Other pathologic processes (both neoplastic and inflammatory) may mimic pituitary adenomas on imaging, or sometimes even clinically (i.e. compression of the optic chiasm). The most frequent tumor among these are craniopharyngiomas, originating from Rathke pouch epithelium. The pituitary gland is also the second most common CNS site for germ cell neoplasms, after the pineal gland [14,15]. Less commonly, tumors of the posterior lobe occur, including pituicytoma, granular cell tumor, and spindle cell oncocytoma, which, unlike Pit NETS, lack staining for synaptophysin or pituitary hormones [16]. Additional possibilities include pituitary blastoma (an embryonal, undifferentiated malignancy), or tumors from the overlying meninges (sellar diaphram), most commonly, meningiomas [1,17].

Inflammatory and related processes also occur in the pituitary region. These include lymphocytic hypophysitis (an autoimmune disorder often occurring in pregnancy), IgG4 disease (an autoimmune disorder rich in IgG4 plasma cells with resulting organ fibrosis), and Langerhans cell histiocytosis (a neoplastic, clonal proliferation of Langerhans Cells) [4,18].

The pictures are excellent, and illuminating. Normal pituitary microanatomy is juxtaposed and contrasted with the pathology of Pit NETs. Pituitary adenoma classification, with adenoma subtypes, anterior pituitary cell differentiation based on transcription factors, and more aggressive adenomas, is accurately listed. Diagnostic immunohistochemistry of the various adenomas and lesions of the pituitary region are included, with H&Es of related lesions and tumors grouped appropriately for easy differential diagnostic reference.

Conclusion

This manuscript is very interesting and by furnishing a comprehensive review of pituitary adenomas and sellar lesions, adds to the medical literature. The most up to date methods to properly diagnose and classify these entities are provided, fundamental to patient care and treatment decisions.

Acknowledgement

None

Conflict of Interest

The author has no commercial or financial relationship with a direct interest in the subject matter of this article. The author has no funding sources to report.

References

1. Peter J, Kobalka, Huntoon Kristin and Becker Aline P. "Neuropathology of Pituitary Adenomas and Sellar Lesions." *Neurosurgery* 0 (2021): 1-19.
2. Sarah, Larkin, Ansorge Olaf, Feingold Keneeth R and Anawalt Bradley, et al. "Pathology and Pathogenesis of Pituitary Adenomas and Other Sellar Lesions." South Dartmouth 2000.
3. DeMasters BK, Kleinschmidt, Tihan Tarik and Rodriguez Fausto. "Diagnostic Pathology: Neuropathology." (2016).
4. Lopes M and Beatriz S. "The 2017 World Health Organization Classification of Tumors of the Pituitary Gland: a Summary." *Acta Neuropathol* 134 (2017): 521-535.
5. SL, Asa, Casar Borota Olivera, Chanson P and Etienne Delgrange, et al. "From Pituitary Adenoma to Pituitary Neuroendocrine Tumor (PitNET): an International Pituitary Pathology Club proposal." *Endocr Relat Cancer* 24 (2017): C5-C8.
6. Gudio, Rindi, Klimstra David S, Abedi Ardekani Behnoush and Sylvia Asa L, et al. "A Common Classification Framework for Neuroendocrine Neoplasms: an International Agency for Research on Cancer (IARC) and World Health Organization (WHO) Expert Consensus Proposal." *Mod Pathol* 31 (2018): 1770-1786.
7. jacqueline, trouillas, roy pascal, sturm nathalie and emmanuella dantony, et al. "a New Prognostic Clinicopathological Classification of Pituitary Adenomas: A Multicentric Case-Control Study of 410 Patients with 8 Years Post-Operative Follow-Up." Acta Neuropathol. 126 (2013): 123-135.
8. Simona, Serioli, Doglietto Francesco, Fiorindi Alessandro and Antonio Biroli, et al. "Pituitary Adenomas and Invasiveness from Anatomo-Surgical, Radiological, and Histological Perspectives: A Systematic Literature Review." *Cancers* 11(2019): 1936.
9. Osamura, RY, Tahara S, Komatsubara K and Ltoh H, et al. "Pit-1 Positive

***Address for Correspondence:** Peter J Kobalka, Department of Pathology and Laboratory Medicine, The Ohio State University Medical Center, Columbus, United States, Tel: 614-582-8704; E-mail: Peter.Kobalka@osumc.edu*

Received 09 March 2021; **Accepted** 23 March 2021; **Published** 30 March 2021

Alpha-Subunit Positive Nonfunctioning Human Pituitary Adenomas: A dedifferentiated GH Cell Lineage?" *Pituitary* 1(1999): 269-271.

10. Hiroshi, Nishioka, Inoshita Naoko, Mete Ozgur and Sylvia L Asa, et al. "The Complementary Role of Transcription Factors in the Accurate Diagnosis of Clinically Nonfunctioning Pituitary Adenomas." *Endocr Pathol* 26 (2015): 349-355.
11. Bruno S and Darzynkiewicz Z. "Cell Cycle Dependent Expression and Stability of the Nuclear Protein Detected by Ki-67 Antibody in HL-60 Cells." *Cell Prolif* 25 (1992):25 31-40.
12. Christian, Miermeister, Petersenn Stephan, Buchfelder Michael and Rudolf Fahlbusch, et al. "Histological Criteria for Atypical Pituitary Adenomas - Data from the German Pituitary Adenoma Registry Suggests Modifications." *Acta Neuropathol Commun* 3 (2015): 1-11.
13. Ryan M, Carey, Kuan Edward C, Workman Alan D and Neli N Patel, et al. "A Population-Level Analysis of Pituitary Carcinoma from the National Cancer Database." *J Neurol Surg B Skull Base*. 81 (2020): 180-186.
14. Qingchun, Mu, Yu Jinlu, Qu Limei and Xitong Hu, et al. "Spindle Cell Oncocytoma of the Adenohypophysis: Two Case Reports and a Review of the Literature." *Mol Med Rep* 12 (2015): 871-876.
15. Domenico, Billeci, Marton Elisabetta, Giordan Enrico and Carraro Valentain, et al. "Spindle Cell Oncocytoma: Report of Two Cases with Massive Bleeding and Review of the Literature." *J Clin Neurosci* 39(2017): 39-44.
16. Syed Ijlal, Ahmed, Javed Gohar, Laghari AA and Syeda Beenish Bareeqa, et al. "Third Ventricular Tumors: A Comprehensive Literature Review." *Cureus* 10(2018): e3417.
17. Horvath Eva, Kovacs Kalman and Scheithauer Bernd. "Pituitary Hyperplasia." *Pituitary* 3(1999): 169-179.
18. Sarah, Larkin and Karavitaki Niki. "Recent Advances in Molecular Pathology of Craniopharyngioma." F1000Res. 6(2017): 1202.

How to cite this article: Kobalka Peter J. "A Commentary on Neuropathology of Pituitary Adenomas and Sellar Lesions." *J Clin Res* 5 (2021) 126.