Prospective Experience with Routine SSTR2A Immunohistochemistry in Neuroendocrine Epithelial Neoplasms

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Background: Neuroendocrine epithelial neoplasms (NENs) express high levels of somatostatin receptors, the basis of octreotide therapy and somatostatin receptor imaging (SRI). In the Fall of 2014 we began routine immunohistochemistry (IHC) testing of all neuroendocrine tumors (NETs) for SSTR2A, using the monoclonal antibody UMB-1. Cases are scored based on criteria proposed by Korner and Reubi (AJSP 2012). We also test neuroendocrine carcinomas (NECs) upon request. Herein, we report our first year's prospective experience.

Methods: We searched the pathology database for all SSTR2A IHC orders. Most stains (>90%) had been interpreted by a single pathologist in the context of routine care. The following clinicopathologic data were obtained: SSTR2A result, SSTR2A H-score (extent*intensity), age, gender, anatomic site, differentiation (well, poor), WHO 2010 grade (G1-3), SRI results, prior somatostatin analogue treatment.

Results: We performed 214 IHC in 203 patients (M:F, 1:1; mean/median age 57/59). SSTR2A IHC was positive in 91% of 192 NETs and 26% of 19 NECs; 91% of 85 G1 and 90% of 97 G2 tumors; and 100% of 10 morphologically well-differentiated but G3 neoplasms. While 97% and 99% of pancreatic and ileal NETs were positive, only 38% of lung tumors were. 64% and 33% of patients with a negative OctreoScan or DOTA-scan, respectively, were IHC-positive.

Conclusion: Routine SSTR2A in NENs is clinically feasible. As expected, SSTR2A is highly expressed in NETs. Of interest, expression appears less common in lung. There is no significant difference in SSTR2A-positivity between G1 and G2 tumors. A surprising number of poorly differentiated and G3 tumors are positive, with follow up imaging and treatment implications. Patients with negative SRI are also often positive, opening up somatostatin-based therapy in these patients.

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