Merkel Cell Carcinoma Exhibiting Cytoplasmic OCT4 Staining: A Potential New Diagnostic Immunohistochemical Marker?

Chia-Sui Kao, MD\textsuperscript{1}, Simon Warren, MD\textsuperscript{1}, Muhammed Idrees, MD

\textsuperscript{1}Indiana University School of Medicine, Indianapolis

OCT4, a transcription factor, has been useful in the diagnosis of germ cell tumors, showing a characteristic nuclear staining pattern for seminoma and embryonal carcinoma. However, a cytoplasmic OCT4 staining pattern in paraganglionic tissue has been observed in our institution. We hypothesize the OCT4 is reacting with the cytoplasmic neurosecretory granules. The goal of this study is to analyze the reactivity of OCT4 with Merkel cell carcinoma and its utility as a new diagnostic marker. From our surgical pathology files, 16 cases of Merkel cell carcinoma of the skin were identified and confirmed by reviewing H&E-stained sections. The amount of cytoplasm was recorded for each case: scant was defined as most tumor cells showing nuclear molding with imperceptible cytoplasm, and moderate was defined as most tumor cells with perceivable clear to eosinophilic cytoplasm. OCT4 (Cell Marque, Rocklin, CA) immunostain was performed and evaluated for intensity and extent of positivity for each case. Of 16 cases, 14 expressed cytoplasmic OCT4 staining ranging from weak to strong intensity and 5\% to 100\% extent. Of 12 cases with moderate cytoplasm, 10 showed at least moderate intensity, staining greater than 20\% of tumor cells. Of the 4 cases with scant cytoplasm, 2 showed moderate 5\% staining and weak 10\% staining, respectively; the remaining 2 cases were completely negative. The adjacent squamous cells, adnexal structures, and basal cells showed no reactivity with OCT4. OCT4 is a sensitive immunostain for diagnosing Merkel cell carcinoma, and those with more cytoplasm compared with the classical “small cells” will show more diffuse and intense cytoplasmic OCT4 staining, arguably with more neurosecretory granules in the cytoplasm. A cytoplasmic OCT4 reactivity is valuable in diagnosing Merkel cell carcinoma, and this specific staining pattern may be related to this particular OCT4 (Cell Marque) antibody.

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