Introduction

Merkel cell carcinoma (MCC) is an aggressive cancer of neuroendocrine origins. First described by Toker, this tumor was named after its resemblance to the normal Merkel cell. The Merkel cell is a specialized cell related to touch that is located in the basal layer of the epidermis (1,7). Although the cells of MCC and the normal Merkel cell share some common traits the link has been disputed (8). Consequenly, many synonyms exist: trabecular carcinoma, primary small cell carcinoma, cutaneous apudoma and primary neuroendocrine carcinoma. However, the term Merkel cell carcinoma is still widely prevalent.

Currently, various histological stains are warranted to confirm the suspected diagnosis of MCC. Cytokeratin, especially Cytokeratin 20 (ck20), are considered tumor in the immunohistochemical differentiation of this malignancy. CK20 is positive in a large majority of MCC cases (5,4) with a specific paranuclear dot or globular pattern. CK20 is considered the benchmark stain for MCC; however, in several studies it has not been 100% sensitive, which is why other stains have been employed in a panel.

Other stains in the MCC panel include cd56 (or neural cell adhesion molecule), synaptophysin, neurofilament, neuron-specific enolase (NSE), chromogranin and thyroid transcription factor 1 (TTF-1). TTF-1 is used to differentiate MCC from other pulmonary and extra pulmonary neuroendocrine tumors (10). In MCC, TTF-1 should be negative to rule the possibility of metastatic cancer (especially lung). S100 is also negative.

Because of the varying degrees of success of other MCC markers, we sought to undertake a study using another cytokeratin marker, AE1/AE3, that may improve diagnostic accuracy and speed of MCC. Cytokeratin AE1/AE3 is a monoclonal antibody that highlights monofilaments of intermediate weight in human skin (6).

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Objective

To find a more sensitive cytokeratin marker for Merkel cell carcinoma.

Methods

The study is a retrospective chart review of a single institution database. Cases identified as MCC were pulled.

Tissue blocks were re-cut and stained with ck 20, AE1/AE3, cd56, synaptophysin, neurofilament, NSE, chromogranin and TTF-1.

Results:

A total of 19 cases were reviewed. CK 20: 16 of 19 positive, AE1/AE3: 19 of 19 positive. Chromogranin: 7 of 19 positive. Synaptophysin: 19 of 19 positive. Neurofilament: 8 of 19 positive. NSE: 10 of 19 positive. TTF-1: 16 of 19 positive.

Background:

Over 20% of Merkel cell carcinoma (MCC) do not stain positive for cytokeratin 20 (ck20).

TTF-1 should be negative to rule the possibility of metastatic cancer (especially lung). S100 is also negative.

LIMITATIONS

This study did not control for the positivity of AE1/AE3 in other basaloid or blue cell tumors and neuroendocrine proliferations. Further study should be conducted to determine staining characteristics for the aforementioned pathologic processes. This study is an observational chart review and is subject to selection bias.

Conclusion

We suggest AE1/AE3 be used in addition to or in lieu of other cytokeratins in the identification of MCC.

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BIBLIOGRAPHY


RESULTS

Chart 1: Graphical representation of staining characteristics of cases in study