SOX10 commonly stains scar in Mohs sections

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Abstract

Sox10 immunostaining is used for the diagnosis and margin evaluation of melanocytic lesions. Sox10 was initially thought not to stain fibrohistiocytic processes. Consequently, it was believed to reliably distinguish desmoplastic melanoma from scar. However, recent data from formalin sections suggest Sox10 is less specific than previously thought. In this report, we demonstrate that Sox10-stained Mohs sections commonly show strong, fractional staining of scar. When using Sox10 with frozen section immunohistochemistry, Mohs practitioners should recognize the potential of this marker to stain scar to avoid overdiagnosis of desmoplastic melanoma.

Keywords: Mohs micrographic surgery, melanoma, Sox10, scar

Introduction

SOX10 is a commonly used marker for the diagnosis of melanocytic neoplasms on formalin sections. It can also be used on frozen sections for rapid immunohistochemical margin assessment. Initial reports suggested SOX10 immunostaining could reliably distinguish amelanotic melanoma from dermal scar and fibrohistiocytic processes [1, 2]. However, more recently published data on formalin sections indicate that SOX10 frequently stains scar [3, 4]. In our practice, several cases of melanoma in situ, lentigo maligna (LM-MIS) type were found during Mohs micrographic surgery (MMS) to have SOX10-positive, MART-1-negative cells in the dermis without findings suspicious for invasive melanoma on hematoxylin and eosin sections. Tissue from these cases was submitted for formalin processing and formal dermatopathology review and considered scar. To better characterize the propensity for SOX10 to label scar on frozen sections, we stained a series of non-melanocytic MMS cases with SOX10.

A total of 31 MMS specimens (all keratinocyte carcinoma cases) showing regions of thickened collagen bundles and stellate fibroblasts consistent with scar on frozen section hematoxylin and eosin were included. These de-identified specimens had additional sections cut at 4µm and were stained with a modified, rapid, immunohistochemical protocol for SOX10 (Biocare, mouse monoclonal antibody at 1:50 dilution) with a negative control [5]. Endogenous peroxidase blocking was performed on all specimens prior to primary antibody incubation and no SOX10 staining was seen in negative control specimens.

Of the 31 specimens, 11 showed SOX10 staining of presumed fibrohistiocytic cells within scar in sections without any suspicion for a melanocytic process in dermis. Staining of dermal spindled cells was strong but fractional relative to the overall cellularity of scar on hematoxylin and eosin as seen in **Figure 1**. These findings conflict with prior reports touting the specificity of SOX10 for desmoplastic melanoma [1, 2]. Our data further corroborate recent reports from the dermatopathology literature finding that non-melanocyte SOX10 staining is commonly seen in re-excision specimens [3, 4]. These SOX10-positive cells are presumably fibrohistiocytic, although the fractional staining seen in cellular scar may suggest a distinct lineage of these cells. SOX10 staining of

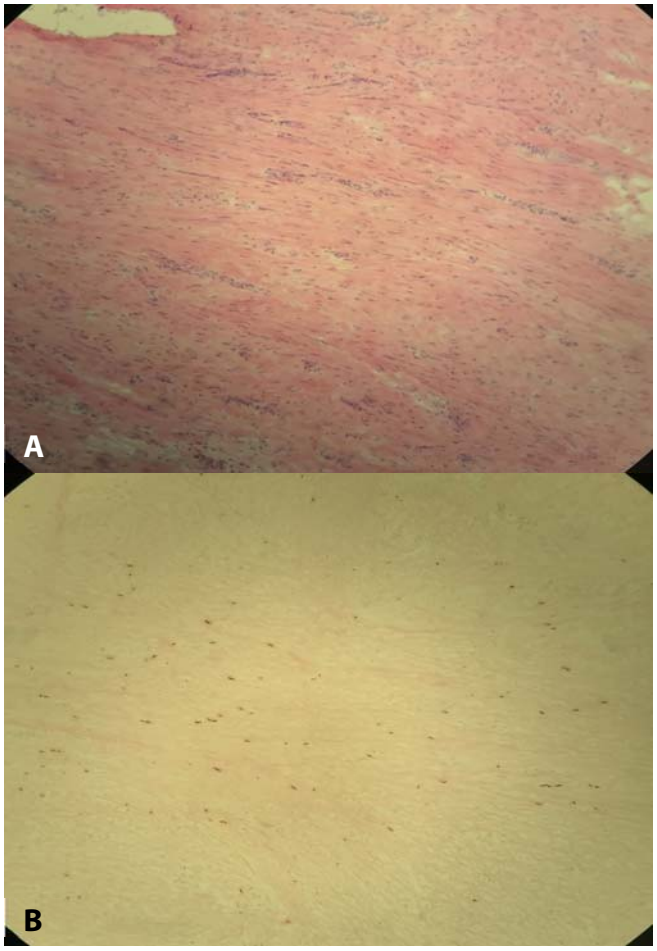

Figure 1. ***A)*** *Mohs hematoxylin and eosin section showing cellular scar, 10×.* ***B)*** *The same Mohs SOX10-stained section showing fractional staining of cells, 10×.*

regenerating Schwannian cells has also been hypothesized [4].

Conclusion

SOX10 is a melanocytic antigen used for the diagnosis and margin assessment of melanocytic neoplasms. This nuclear marker may be useful to better appreciate the true density of melanocytes that may be overestimated by MART-1 dendritic staining on heavily sun-damaged skin. However, when using SOX10 during MMS for melanoma, it is important to recognize that this marker frequently stains scar on rapid frozen sections. Caution should be used when interpreting dermal SOX10-positive cells as invasive or desmoplastic melanoma in the absence of corroborating evidence on hematoxylin and eosin. The morphology of these cells on H/E may assist in categorizing the malignant potential of these findings [4]. Submitting LM-MIS cases with SOX10-positive dermal proliferations for formalin processing and assessment may allow more precise morphologic categorization of such proliferations.

Potential conflicts of interest

The authors declare no conflicts of interests.

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