Rapid SOX10 Immunostain on Fresh Frozen Tissue

Sry-related HMG-box gene 10 (SOX10) is a neural crest marker with cutaneous expression limited to melanocytes, eccrine glands, and Schwann cells. SOX10 has been established on formalin sections to be a sensitive marker for melanoma—including desmoplastic and spindled variants.\(^1,2\) SOX10 demonstrates nuclear localization without the dendritic staining seen with Melan-A. These features make SOX10 adaptation to Mohs surgery promising. In this report, we describe the application of rapid SOX10 immunostaining to fresh frozen tissue.

Deidentified redundant tissue from repairs after Mohs surgery for keratinocyte carcinoma on chronically sun damaged skin (CSDS) and debulk tissue from lentigo maligna (LM) that would have been discarded was used. Specimens were cut at 3 μm and fixed in acetone for 30 seconds. After rehydration in 1X tris-buffered saline with tween, sections were incubated in a humidity chamber with mouse monoclonal anti-SOX10 at 1:50 dilution (Biocare BC34) for 15 minutes. Detection was performed using a 2-step polymer detection system (Bio SB Polydetector Plus) with 5-minute incubations for link and horseradish peroxidase. Sections were washed between steps in 1X tris-buffered saline with tween. Chromogen 3,3’ diaminobenzidine was applied for 1 minute before rinsing with tap water. Counterstaining was performed using dilute Giemsa. Melanocyte counts were averaged for 2 hpf (×40) on representative sections of CSDS or LM by blinded observer (M.J.D.) (Figures 1 and 2).

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Rapid SOX10 immunostaining produced crisp nuclear melanocytic signal in 23/23 CSDS specimens and 5/5 LM. Chronically sun damaged skin SOX10 expression was limited to the basal layer of the epidermis and eccrine glands. Nonspecific dermal staining was not seen. Melanocyte mean densities were 13.6 ± 3.5 cells per hpf for CSDS and 63.5 ± 19.4 cells per hpf for LM. SOX10-stained LM exhibited pagetoid spread, nesting, and confluence of melanocytes.

Discussion

SOX10 is expressed in epidermal melanocytes and both benign and malignant melanocytic neoplasms. SOX10 has sensitivity on formalin-fixed tissue approaching 100% for in situ and desmoplastic melanomas. SOX10 expression is restricted to neural crest derivatives and does not seem to stain fibrohistiocytic tumors or spindle cell mimics. Ramos-Herbeth and colleagues described absent or minimal SOX10 signal in epithelioid histiocytes and spindled fibroblasts of excision specimens.

Excellent sensitivity for desmoplastic and lentiginous melanoma, high specificity, and a clean nuclear signal make SOX10 promising for intraoperative section margin evaluation. Rapid SOX10 immunostaining produced consistent, clean signal in CSDS and LM in our series using a 30 minutes protocol. Melanocyte counts in CSDS were similar to those reported for SOX10 on formalin sections by Shin and colleagues.

SOX10 has established utility in formalin section immunohistochemistry of melanocytic neoplasms. The crisp SOX10 nuclear signal we demonstrated may allow more precise melanocyte visualization and differentiation between LM and CSDS. Further studies are needed to directly compare the performance of SOX10 to other melanocyte antigens commonly used during Mohs surgery.

References


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