The Patterns of Pitfalls in the Application of Smooth Muscle Actin (SMA) Immunostaining for Breast Cytological Analyses

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Abstract : The identification of myoepithelial cells (MECs) is useful for breast cytology. Since MECs are not always easily identified morphologically, the immunostaining of smooth muscle actin (SMA) which is a common and a reliable marker for MECs is a useful tool. Our purpose was to investigate the patterns of pitfalls regarding the application of SMA immunostaining for breast cytological analyses. Sixty-five cases of invasive breast carcinoma were available for both immunocytochemical and immunohistochemical examinations. There were 3 patterns of pitfalls as follows. 1) Many SMA positive myofibroblasts mimicking MECs were scattered in the background (18.5%). 2) The clusters with SMA negative tumor cells and SMA positive MECs or myofibroblasts were recognized and found to mimic benign dimorphic clusters (10.8%). 3) The clusters composed of SMA positive tumor cells suggested the possibility of myoepithelial differentiation (9.2%). In conclusion, it is necessary to keep in mind the 3 patterns of pitfalls when performing SMA immunostaining for breast cytological analyses.