D24

Adam Naqvi Advisor(s): Jiang Chen

Using Primary Cilia in Distinguishing Dysplastic Nevi from Melanoma

Background: Early diagnosis and intervention are among the most effective approaches to reduce melanoma-related morbidity and mortality. However, distinguishing early-stage melanomas from benign melanocytic lesions with atypia is extremely challenging because these two entities exhibit overlapping clinical and histopathological features.
Objectives: To retrospectively determine whether primary cilia can be used to differentiate melanomas from dysplastic nevi within shave biopsies that were previously diagnosed as ambiguous melanocytic lesions.
Methods: Shave biopsies that were diagnosed as ambiguous melanocytic lesions with atypia were included in this study. Definitive diagnoses on these lesions, either benign or malignant, were achieved based on exhaustive histological evaluations of step sections of corresponding resection biopsies. Primary cilia were quantified based on immunofluorescence labeling. A diagnostic cut-off of ciliated melanocytes was established based on a previously published cohort. This cut-off was used to determine how well it can segregate these otherwise ambiguous shave biopsies.
Results: Histological evaluation of subsequent resections identified 13 malignant lesions out of the 24 previously diagnosed ambiguous shave biopsies. In both shave biopsies and resections, melanocytic cells in malignant specimens contained significantly fewer ciliated cells than their benign counterparts ($p = 0.0035$ or 0.0011, respectively). A cut-off at 10% was established in the training cohort. When applied to these ambiguous shave biopsies, it achieved a diagnostic sensitivity of 80.0% and specificity of 81.8%. Its sensitivity was higher than Ki67, which was 66.7% for these shave biopsies.
Conclusions: These data suggest that the primary cilium is a useful biomarker for diagnosing early-stage melanomas from challenging cases of melanocytic lesions with atypia.