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Renal fibrosis calculation: man and machine is better than man vs. machine

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Interstitial fibrosis (IF) is an indicator of chronic renal damage in transplanted kidneys. It results from an accumulation of insults namely drug toxicity, infection and rejection. Manual scoring (MS) using Banff criteria is a very reproducible means of establishing the IF score of a renal transplant biopsy and is distributed into four categories: <5%, 5-25%, 25-50% and 50%. But MS for smaller changes in IF between biopsies is neither accurate nor reproducible. Thus the need for automation. Mason trichrome-stained whole slide images of renal transplant biopsies were scored using the Histolab program. Fibrosis scores were obtained of the cortex after excluding perivascular and periglomerular areas of collagen deposition/fibrosis. The method requires the creation of a 'mask' for the area of fibrosis and then adjustments of the settings to detect the areas of interest. Variability of staining between biopsies may occur due to differences in reagent lots, incubation times and variability of tissue processing. These can be accounted for by tweaking the settings. Staining artifacts such as staining of tubular epithelial cytoplasm and tissue-edge artifacts are overcome by manual inspection after creation of the mask. This adjustment facilitates selection of appropriate areas of interest. In conclusion, both man and machine working in concert, can obtain a more accurate fibrosis score than each working alone.

Biography

S Setty is the Director of renal and transplant pathology at University of Illinois, Chicago.

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