Unique EM Findings in Glomeruli

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Abstract

Background. The correlation between light microscopy, immunofluorescent stains (IF) and electron microscopy (EM) is the key part to reaching the final correct diagnosis of medical renal biopsies. As EM remains black and white, some details of EM are easy to be ignored during daily practice. The goal of this presentation is to summarize some subtle but important findings of EM in glomeruli, which can be correlated with IF findings.

Methods. Data from our studies and literature are analyzed and presented.

Results. Primary membranous glomerulopathy often has intramembranous vacuoles due to low affinity of IgG4 to glomerular basement membranes (GBM), while membranous lupus nephritis does not usually show the vacuoles in GBM due to its strong IgG1 binding to GBM. Monoclonal clonal protein deposits and C3 deposits in glomeruli generally have smooth contours and gray colored deposits, due to their relatively simple compositions, when compared to irregular and darker immune complex deposits. For punctate IgG minimal change disease, which is often associated with anti-nephrin antibody, there are diffuse effacement of foot processes but also detached foot processes forming ballooning clusters in Bowman space, where subtle immune complex deposits are found via immunogold labeling.

Conclusions. Some unique but subtle findings by EM are meaningful in corresponding to their respective glomerular immunofluorescent and immunohistochemical stains such as primary membranous glomerulopathy, several types of monoclonal protein associated glomerulopathies, C3 glomerulopathy, and punctate IgG minimal change disease.