1. Which of the following are characteristic of nephritic syndrome?
    a. Hypoalbuminemia
    b. Edema
    c. Hyperlipidemia
    d. Thrombosis
    e. All of the above

Answer: E. All of the answers are found in patients with nephritic syndrome. (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 978-79)

2. All of the following are causes of nephrotic syndrome EXCEPT:

    e. Acute infectious glomerulonephritis

Answer: E. Acute infectious glomerulonephritis presents with a nephritic picture which is characterized by red cell casts in the urine. Nephritic syndrome is also characterized by azotemia and hypertension. There is often proteinuria and edema, but it is not isolated or usually as much as in nephrotic syndrome. (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 973-974)

3. This disease process is characterized by >50% of glomeruli with collapsed glomerular tufts and proliferation of Bowman's capsule (crescents). Immunofloresence is negative, but serum c-ANCA is positive. The best diagnosis is:

    c. Type III RPGN

Answer: C. This case illustrates a case of Wegner's granulomatosis, which is a type III RPGN in the kidney. (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 973-974)

4. Which of the following glomerulonephropathy is the most common cause of nephrotic syndrome in adults? It is characterized by diffuse thickening of the glomerulocapillary wall with electron dense deposits on the subepithelial side of the epithelial membrane.

    c. Membranous GN

Answer: C. These are characteristics of Membranous GN (most common cause of nephrotic syndrome in adults, thickened glomerulocapillary walls, and electron dense subepithelial deposits).

5. This renal disorder is characterized by a clinical association with respiratory infections or immunization and a prompt response to steroid therapy.

    a. Minimal change disease

Answer: A. Minimal Change Disease. MCD is characterized by diffuse effacement of foot processes (podocytes). By histologic examination the glomeruli look unremarkable. This is the most common cause of nephrotic syndrome in children. (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 978-79)

6. A 67 y/o male with a h/o MM presents with ARF. A renal bx. Is performed and the histology is on the website (Case #1) for review. Based on the findings and the clinical history, the most likely diagnosis is:

    b. Nephrocalcinosis

Answer: B. This is a case of nephrocalcinosis secondary to hypercalcemia induced by multiple myeloma. There is associated acute tubular injury. Nephrocalcinosis is not specific to MM, but it is important to remember that MM is a destructive boney disease with resultant hypercalcemia. Usually, renal pathology in MM is thought about in the context of immunoglobulin deposition in tubules or the interstitium inducing renal failure. (*Non-Neoplastic Kidney Diseases*. Vivette DD, et al. AFIP Non-Tumor Fascicle Series #4. 2005. p. 626-628. and *Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 993)

7. A 29 y/o female with a h/o of Alport's syndrome presents with increasing creatinine. The H&E and PAS histology from the renal biopsy are on the website (Case #2) for review. Examination of the biopsy shows ATN with eosinophilic interstitial nephritis. On the H&E stains there are noted to be small blue amphophilic inclusions, which are highlighted on PAS. Base on the clinical history and the morphologic findings, the most likely diagnosis is:

    c. Malakoplakia

Answer: C. This is an example of malakoplakia. Malakoplaia should always be in the differential diagnosis of cellular inclusions in a renal biopsy. It is defined by the Macalus-Gotman body. Unfortunately, the images for this question do not highlight these inclusions as much as they need to be for absolute identification. Further review in a reference text is recommended. Malakoplakia is most commonly associated with E. coli infection, and approximately ½ of patients have some form of immunosuppression. PAS helps to highlight the cytoplasmic granules, and a von Kossa is a calcium stain which will highlight the McCalus-Gootman bodies. Malakoplakia probably represents dysfunctional intracellular processing of engulfed bacteria by histiocytes. (*Non-Neoplastic Kidney Diseases*. Vivette DD, et al. AFIP Non-Tumor Fascicle Series #4. 2005. p. 561-563)

8. A 44 y/o white male with a h/o proteinuria since the age of 8 undergoes a renal biopsy. A representative microscopic image is shown on the website (Case #3). Routine histology shows unremarkable glomeruli, and the Jones stain highlights patent capillaries with basement membranes of normal thickness. EM findings are available for review. The IF is negative and not shown. Based on the clinical history and renal biopsy findings, the best diagnosis is:

    a. Minimal Change Disease

Answer: A. This case represents a case of minimal change disease. The IF is negative and the light microscopy is unremarkable. The only diagnostic finding is the foot process effacement of the podocytes. MCD is the most common cause of nephrotic syndrome in children, and is usually responsive to steroid therapy. An interesting point of trivia is that there is an increased incidence of MCD in patients with Hodgkin's disease. FSGS can look identical to MCD accept the presence of sclerosis in some glomeruli. Therefore, in the diagnosis of MCD, FSGS can not be entirely excluded (especially when there are a limited number of glomeruli to evaluate). (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 981-984)

9. A 57 y/o white female with a h/o multiple myeloma presents with acute renal failure. Representative histologic sections from the renal biopsy are on the website for review (Case #4). Based on the clinical history and biopsy findings, the best diagnosis is:

    c. Cast nephropathy

Answer: C. This is an example of myeloma cast nephropathy. Note the tinctorial properties of the material on trichrome stain. This implies multiple layers of deposition of material. The diagnosis of amyloidosis may be considered, especially if the congo red stain is positive. However, this is not diagnosed because of the exclusive intratubular location. (*Non-Neoplastic Kidney Diseases*. Vivette DD, et al. AFIP Non-Tumor Fascicle Series #4. 2005. p. 604-607)

10. A patient presents with acute renal failure and hempotysis. A renal biopsy was performed and representative images are shown on the website (Case #5) for review. Most notable are numerous crescents with >50% of the glomeruli being affected. Serologic studies showed a positive c-ANCA. IF is negative. Based on the clinical history, serologic findings and biopsy findings the best diagnosis is:

    e. RPGN type III

Answer: E. This is an example of Wegner's granulomatosis which is a systemic vasculitis and is classifies as a type III RPGN. This category includes pauci-immune cases of RPGN. This category also includes microscopic PAN/ microscopic polyangitis in addition to idiopathic causes. Henoch-Schonlein purpura is a type II RPGN and is closely associated with IgA nephropathy (Berger's disease). Type II RPGN is an immune complex deposition disease category. Goodpasture's syndrome is a type I RPGN. This category is defined by anti-basement membrane antibodies. This gives a linear IF pattern. (*Robins and Cotran: Pathologic Basis of Disease*. Kumar, V. et al., 7th Edition. 2005. p. 976-978)

Notes for question set:[1]

[1] PathMD strives for the highest quality and accuracy. However, the *PathMD: Board Review Letter* is for review purposes and not meant for clinical decision making. It should not be used in place of review of primary reference texts and the current medical literature. If inaccuracies are identified, please notify us so that a correction may be published. (info@PathMD.com)

