**Solutions to Organized Deposits in the Kidney**

**Answers:** 1: B; 2: C; 3: C; 4: C

Summary: Glomerular deposits with substructure on electron microscopy – differential diagnosis.

**Amyloidosis** is Congo Red positive with an often nodular appearance on light microscopy. When due to monoclonal light chain (AL type), the immunofluorescence shows staining for one but not the other light chain. The electron microscopy (EM) shows randomly arranged fibrils 8-10 nm in diameter.

**Monoclonal immunoglobulin disease** (light-chain deposition disease, heavy chain deposition disease, light and heavy chain deposition disease) is Congo Red negative and monotypic light and/or heavy chains on immunofluorescence. EM shows amorphous deposits that are usually finely granular.

**Immunotactoid glomerulopathy** (immunotactoid glomerulonephritis) is Congo Red negative, with variable lesions on light microscopy such as mesangial proliferative changes or a membranoproliferative pattern. The immunofluorescence shows mostly monoclonal immunoglobulin G (IgG) or IgM, however, an M spike or cryoglobulins cannot be demonstrated in the circulation. EM shows 30-90 nm hollow microtubules arranged as parallel stacks. The process is often associated with lymphoproliferative disorders.

**Fibrillary glomerular disease** (fibrillary glomerulonephritis) is Congo Red negative, with variable light microscopy findings, similar to immunotactoid glomerulonephritis. Immunofluorescence shows IgG and C3 with equivalent kappa and lambda light chains. The EM shows non-branching fibrils, randomly arranged in an amorphous matrix. The fibrils are larger than amyloid and measure around 20nm.

**Cryoglobulinemic glomerulonephritis** is Congo Red negative, with a diffuse proliferative, membranoproliferative, or mesangioproliferative pattern. “Pseudothrombi” can be seen in the glomerular capillaries. Immunofluorescence findings depend on the type: monotypic
immunoglobulin if type 1 and polyclonal IgG or IgM if type 2. The EM often shows curved microtubular arrays.

**Collagenofibrotic glomerulopathy** is Congo Red negative, with light microscopy showing a membrandroproliferative pattern of injury. Immunofluorescence reveals strong IgM, IgG, C3, and collagen III staining. The EM shows fibrillar deposits with transverse band structures and periodicity of 60nm.

**Fibronectin glomerulonephritis** is Congo Red negative, with light microscopy showing large periodic acid–Schiff positive deposits. This material stains for fibronectin by immunofluorescence microscopy or immunohistochemistry. The EM shows mostly amorphous deposits with focal randomly arranged filamentous deposits 8-12 nm in width.

**Lupus Nephritis with organized deposits** is Congo Red negative with variable light microscopy findings. There is often a full-house staining pattern on immunofluorescence. The EM shows granular deposits with “finger-print” like curvilinear arrays.