Introduction

Introduction and Overview

Introduction to Renal Pathology

Normal Kidney Structure

Normal Kidney Development

Glomerular Diseases

Podocytopathies

Minimal Change Disease

Classification of FSGS

Etiologic Classification of FSGS

FSGS, Primary

FSGS, Adaptive (Secondary)

Collapsing Glomerulopathy

Membranous Glomerulonephritis

Etiologic Classification of Membranous Glomerulonephritis

Membranous Glomerulonephritis, Primary

Membranous Glomerulonephritis, Secondary

Membranous Glomerulonephritis With Anti-TBM Antibodies

C3-Related Glomerulonephritis and Membranoproliferative Glomerulonephritis

Classification of MPGN and Complement-Related Diseases

Dense Deposit Disease

C3 Glomerulonephritis

Membranoproliferative Glomerulonephritis With Immune Complexes

IgA-Related Glomerulonephritis

Overview of IgA-Related Glomerulopathies

IgA Nephropathy

IgA Vasculitis (Henoch-Schönlein Purpura)

SLE and Related Autoantibody-Mediated GN

Systemic Lupus Erythematosus

Mixed Connective Tissue Disease

Rheumatoid Arthritis

Mixed Cryoglobulinemic Glomerulonephritis

Idiopathic Nonlupus Full-House Nephropathy

Anti-GBM Nephritis

Anti-GBM Glomerulonephritis

Atypical Anti-GBM Nephritis

Monoclonal Immunoglobulin Diseases

Introduction to Diseases With Monoclonal Immunoglobulin Deposits

Monoclonal Immunoglobulin Deposition Disease

Proliferative Glomerulonephritis With Monoclonal IgG Deposits

Membranous Glomerulonephritis With Masked IgG ? Deposits

Type I Cryoglobulinemic Glomerulonephritis

Waldenström Macroglobulinemia

Amyloidosis

Amyloidosis Classification

AL/AH Amyloidosis

AA Amyloidosis

AFib Amyloidosis

AGel Amyloidosis

ALECT2 Amyloidosis

AApoAI Amyloidosis

ApoAII Amyloidosis

AApoAIV Amyloidosis

AApoCII Amyloidosis

ATTR Amyloidosis

Idiopathic Fibrillary Glomerulopathies

Diseases With Organized Deposits

Fibrillary Glomerulopathy

Immunotactoid Glomerulopathy

Fibronectin Glomerulopathy

Diabetic Renal Disease

Diabetic Nephropathy

Idiopathic Nodular Glomerulopathy

Infection-Related Glomerular Disease

Overview of Infection-Related Glomerular Disease

Acute Poststreptococcal Glomerulonephritis

Acute Postinfectious Glomerulonephritis, Nonstreptococcal

*IgA Acute Glomerulonephritis Associated With *Staphylococcus aureus**

Glomerulonephritis of Chronic Infection, Including Shunt Nephritis

Endocarditis

Syphilis

Lyme Disease

Hepatitis B Virus

Hepatitis C Virus

HIV-Associated Nephropathy

Miscellaneous HIV-Associated Renal Diseases

Schistosomiasis

Filariasis

Leishmaniasis

Drug Induced Glomerular Diseases

Drug-Induced Minimal Change Disease

Bisphosphonate-Induced Collapsing Glomerulopathy

Chloroquine Toxicity

Anti-Hepatitis C Virus Drugs

Anti-EGFR Drugs

Genetic Diseases of the Glomerulus

Overview and Classification of Genetic Diseases of the Glomerulus

Genetic Diseases of the Glomerular Basement Membrane Collagen

Alport Syndrome

Thin Basement Membrane Disease

Genetic Diseases of the Podocyte

Diffuse Mesangial Sclerosis

Congenital Nephrotic Syndrome of the Finnish Type

Pierson Syndrome

Galloway-Mowat Syndrome

Denys-Drash Syndrome

Frasier Syndrome

Podocin Deficiency

Alpha-Actinin-4 Deficiency

*Autosomal Dominant FSGS Due to *INF2* Mutations*

**APOL1*-Related Glomerular Disease*

Schimke Immuno-Osseous Dysplasia

Genetic Storage and Lipid Diseases

Lecithin-Cholesterol Acyltransferase Deficiency

APOE Lipoprotein Glomerulopathy

Type III Hyperlipoproteinemia

Fabry Disease

Gaucher Glomerulopathy

I-Cell Disease (Mucolipidosis II)

Alagille Syndrome

Other Genetic Diseases Affecting the Glomerulus

Glomerulopathy of Hereditary Multiple Exostoses

Type III Collagen Glomerulopathy

Nail-Patella Syndrome

Miscellaneous Glomerular Diseases

C1q Nephropathy

IgM Nephropathy

Cryofibrinogenic Glomerulopathy

Hepatic Glomerulosclerosis and IgA Deposition

Hemophagocytic Glomerulopathy

Podocyte Infolding Glomerulopathy

Metabolic Syndrome/Obesity-Related Glomerular Disease

Intravascular Large B-Cell Lymphoma

Vascular Diseases

Overview and Classification of Systemic Vasculitides

ANCA Disease

ANCA-Related Glomerulonephritis

Microscopic Polyangiitis

Granulomatosis With Polyangiitis

Eosinophilic Granulomatosis With Polyangiitis (Churg-Strauss)

Drug-Induced ANCA Vasculitis

Non-ANCA Vasculitides

Polyarteritis Nodosa

Kawasaki Disease

Giant Cell Arteritis

Takayasu Arteritis

Hypocomplementemic Urticarial Vasculitis (Anti-C1q Vasculitis)

Thrombotic Microangiopathies

Introduction to Thrombotic Microangiopathies

Hemolytic Uremic Syndrome, Infection Related

Thrombotic Microangiopathy, Genetic

Thrombotic Microangiopathy, Autoimmune

Thrombotic Microangiopathy, Drug Induced

Postpartum Hemolytic Uremic Syndrome

Scleroderma Renal Disease

Multicentric Castleman Disease

Other Diseases Affecting the Endothelium

Preeclampsia, Eclampsia, HELLP Syndrome

Radiation Nephropathy

Glomerulopathy of Hereditary Multiple Extoses

Sickle Cell Nephropathy

Hypertensive Renal Disease

Hypertensive Renovascular Disease

Renal Artery Stenosis

Fibromuscular Dysplasia

Neurofibromatosis

Thrombotic and Embolic Disease

Renal Vein Thrombosis

Renal Artery Thrombosis

Atheromatous Emboli

Hydrophilic Polymer Emboli

Tubulointerstitial Diseases

Overview and Classification of Tubulointerstitial Diseases

Differential Diagnosis of Acute Interstitial Nephritis

Ischemic Injury

Acute Tubular Injury

Renal Cortical Necrosis

Septicemia/Shock

Bile Cast Nephropathy

Immunologic Tubular Disease

Tubulointerstitial Nephritis With Uveitis

Sjögren Syndrome

IgG4-Related Kidney Disease

Idiopathic Hypocomplementemic Tubulointerstitial Nephritis

Anti-Tubular Basement Membrane Disease

Antibrush Border Autoantibody Tubulointerstitial Nephritis

Sarcoidosis

Tubulointerstiital Nephritis with IgM+ Plasma Cells

Giant Cell Tubulitis With TBM Deposits

Monoclonal Immunoglobulin Diseases of Tubules

Light Chain Cast Nephropathy

Light Chain Proximal Tubulopathy With Crystals

Light Chain Proximal Tubulopathy Without Crystals

Drug-Induced Tubulointerstitial Diseases

Drug-Induced Acute Interstitial Nephritis

Drugs That Cause Tubulointerstitial Nephritis

Checkpoint Inhibitor-Induced Kidney Diseases

Papillary Necrosis

Myoglobinuria/Rhabdomyolysis/Hemoglobinuria

Cisplatin Nephrotoxicity

Osmotic Tubulopathy

Antiviral Drug Nephrotoxicity

Acute Phosphate Nephropathy

Lithium-Induced Renal Disease

Calcineurin Inhibitor Toxicity

mTOR Inhibitor Toxicity

Vancomycin-Induced Cast Nephropathy

Warfarin Nephropathy

Illicit Drugs and Opioids

Toxic Injury

Lead and Other Heavy Metal Toxins

Aristolochic Acid Nephropathy

Balkan Endemic Nephropathy

Ethylene Glycol Toxicity

Argyria

Autosomal Dominant Tubulointerstitial Kidney Disease

*Autosomal Dominant Tubulointerstitial Kidney Disease, *MUC1*-Related*

*Autosomal Dominant Tubulointerstitial Kidney Disease, *UMOD*-Related*

*Autosomal Dominant Tubulointerstitial Kidney Disease, *REN*-Related*

*Autosomal Dominant Tubulointerstitial Kidney Disease, *HNF1B*-Related*

Genetic Crystal Depostion Diseases

Primary Hyperoxaluria

2,8-Dihydroxyadeninuria

Cystinosis

Uric Acid Nephropathy/Gout

Genetic Transport Diseases

Bartter Syndrome

Dent Disease

Oculocerebrorenal Syndrome of Lowe

Other Genetic Diseases Affecting Tubules

Methylmalonic Acidemia

Systemic Karyomegaly

Mitochondriopathies

Miscellaneous Tubulointerstitial Diseases

Nephrocalcinosis

Secondary Oxalosis

Mesoamerican Nephropathy

Extramedullary Hematopoiesis

Infections of the Kidney

Bacterial Infections of the Kidney

Acute Pyelonephritis

Chronic Pyelonephritis

Xanthogranulomatous Pyelonephritis

Malakoplakia

Tuberculosis

BCG Granulomatous Interstitial Nephritis

Leprosy

Megalocytic Interstitial Nephritis

Nocardiosis

Leptospirosis

Whipple Disease

Fungal, Rickettsial, and Parasitic Infections of the Kidney

Mucormycosis

Candidiasis

Histoplasmosis

Coccidioidomycosis

Blastomycosis

Paracoccidioidomycosis

Aspergillosis

Cryptococcosis

Microsporidiosis

Rickettsial Infections

Toxoplasmosis

Hydatidosis

Viral Infections of the Kidney

Polyomavirus Nephritis

Cytomegalovirus Infection

Adenovirus Infection

Epstein-Barr Virus Nephritis

Herpes Simplex Acute Nephritis

Hantavirus Nephropathy

Developmental Diseases

Overview of Congenital Anomalies of the Kidney and Urinary Tract

Dysplasia/Hypoplasia/Agenesis

Oligomeganephronia

Ectopia, Malrotation, Duplication, Fusion, Supernumerary Kidney

Ask-Upmark Kidney

Renal Tubular Dysgenesis

Cystic Diseases

Overview of Cystic Diseases

Ciliopathies

Autosomal Dominant Polycystic Kidney Disease

Autosomal Recessive Polycystic Kidney Disease

Nephronophthisis and Related Ciliopathies

Other Genetic Cystic Diseases

von Hippel-Lindau Disease

Tuberous Sclerosis Complex

Zellweger Syndrome

Miscellaneous Cystic Diseases

Medullary Sponge Kidney

Mixed Epithelial and Stromal Tumor Family

Pediatric Cystic Nephroma

Acquired Cystic Disease

Simple and Miscellaneous Cysts

Renal Lymphangioma/Lymphangiectasia

Diseases of the Collecting System

Introduction to Impediments to Urine Flow

Reflux Nephropathy

Obstructive Nephropathy

Nephrolithiasis

Loin Pain Hematuria Syndrome

Diseases of the Renal Allograft

Pathologic Classification of Renal Allograft Diseases

Introduction

Evaluation of Allograft Kidney

Evaluation of the Donor Kidney

Rejection

Acute T-Cell-Mediated Rejection

Chronic T-Cell-Mediated Rejection

Hyperacute Rejection

Acute Antibody-Mediated Rejection

Chronic Antibody-Mediated Rejection

Transcript Analysis of Renal Transplant Biopsies

Recurrent and De Novo Diseases

Diseases That Recur in Allografts

De Novo FSGS

De Novo Membranous Glomerulonephritis

Anti-GBM Disease in Alport Syndrome

Engraftment Syndrome

Nonimmunologic Injury

Acute Allograft Ischemia

Hyperperfusion Injury

Urine Leak

Lymphocele

Transplant Renal Artery Stenosis

Renal Artery or Vein Thrombosis

Posttransplant Lymphoproliferative Disease

BK Polyomavirus Neoplasia

Stable and Accepted Grafts

Protocol Biopsies

Accommodation

Tolerance

Kidney Pathology in Recipients of Other Transplants

Kidney Diseases in Nonrenal Transplant Recipients

Graft-vs.-Host Glomerulopathies

Protocols

Biopsy Reports

Kidney Needle Biopsy: Evaluation for Adequacy

Evaluation of Fibrosis

Immunofluorescence on Paraffin Tissue Sections

EM Processing From Paraffin or Frozen Tissue

Detection of PLA2R Deposits and Autoantibodies

Alport Collagen IV Immunofluorescence

C4d Immunohistochemistry/Immunofluorescence

Polyomavirus Detection in Tissue

Mass Spectrometry

Diagnostic Genetics of Kidney Diseases

Examination of the End-Stage Kidney

Examination of Tumor Nephrectomy Specimens for Nonneoplastic Diseases

Evaluation of the Transplant Nephrectomy

Evaluation of Autopsy Kidneys