Tubulointerstitial Disease

**FIGURE 9-46**

A and B, Autosomal-recessive polycystic kidney disease (ARPKD): renal imaging. On ultrasonography of a child with ARPKD the kidneys appear typically enlarged and uniformly hyperechogenic (owing to the presence of multiple small cysts), and demarcations of cortex, medulla, and sinus are lost. The ultrasonographic appearance is different in older children, because cysts can grow and become round; then they resemble the appearance of ADPKD. Figure 9-2 describes how to differentiate the two conditions. (Courtesy of P. Niaudet.)

**FIGURE 9-47**

Autosomal-recessive polycystic kidney disease (ARPKD): liver histology. Liver biopsy specimen from a child with ARPKD shows typical congenital hepatic fibrosis (hematoxylin eosin safran [HES] stain). This portal space is enlarged by fibrosis, and the number of biliary channels is increased, many of them being enlarged and all being irregular in outline. (Courtesy of S. Gosseye.)

**FIGURE 9-48**

Nephronophthisis (NPH): renal involvement. Kidney biopsy specimen visualized by light microscopy with periodic acid–Schiff stain, in a patient with juvenile NPH of an early stage. Note the typical thickening and disruption of the tubular basement membrane (appearing in red); the histiolymphocytic infiltration present at this stage is progressively replaced by interstitial fibrosis.

NPH is an autosomal recessive disorder, accounting for 10% to 15% of all children admitted for end-stage renal failure. Although classified as a renal cystic disorder, NPH is characterized by chronic diffuse tubulointerstitial nephritis; the presence of cysts at the corticomedullary boundary (thus, the alternative term “medullary cystic disease,” now preferably reserved for the autosomal-dominant form; see Fig. 9-43) is a late manifestation of the disease. Clinical features include early polyuria-polydypsia, unremarkable urinalysis, frequent absence of hypertension, and eventually, end-stage renal failure at a median age of 13 (range 3 to 23) years. Ultrasonographic features are summarized in Figure 9-2; medullary cysts are sometimes detected. Associated disorders are detailed in Figure 9-49. A gene called NPH1 that has been identified on chromosome 2 accounts for about 80% of cases [41, 42]. In two thirds of them, a large homozygous deletion is detected in this gene [43]. (Courtesy of P. Niaudet.)
Cystic Diseases of the Kidney

NPH: EXTRARENAL INVOLVEMENT

- Retinitis pigmentosa (Senior-Loken syndrome)
- Multiple organ involvement, including
  - Liver fibrosis
- Other rare features
  - Skeletal changes (cone-shaped epiphyses)
  - Cerebellar ataxia
  - Mental retardation

FIGURE 9-49 Nephronophthisis (NPH): extrarenal involvement. Extrarenal involvement occurs in 20% of NPH cases. The most frequent finding is tapetoretinal degeneration (known as Senior-Loken syndrome), which often results in early blindness or progressive visual impairment. Other rare manifestations include liver (hepatomegaly, hepatic fibrosis), bone (cone-shaped epiphysis), and central nervous system (mental retardation, cerebellar ataxia) abnormalities, quite often in association.

FIGURE 9-50 Orofaciodigital syndrome (OFD). Contrast-enhanced CT, A, and the hands, B, of a 26-year-old woman with OFD type 1 (OFD1) [43]. Multiple cysts involve both kidneys. Note that they are smaller and more uniform than in ADPKD and that renal contours are preserved. Some cysts were also detected in liver and pancreas (arrow). Syndactyly was surgically corrected, and the digits of the hands are shortened (brachydactyly). OFD1 is a rare X-linked, dominant disorder, diagnosed almost exclusively in females, as affected males die in utero.

Characteristic dysmorphic features include oral (hyperplastic frenulum, cleft tongue, cleft palate or lip, malposed teeth), facial (asymmetry, broad nasal root), and digit (syn-brachy-polydactyly) abnormalities. Mental retardation is present in about half the cases. Kidneys may be involved by multiple (usually small) cysts, mostly of glomerular origin; renal failure occurs between the second and the seventh decade of life. Recognition of the dysmorphic features is the key to the diagnosis [44, 45]. (Courtesy of F. Scolari.)

References