A 20-YEAR-OLD morbidly obese woman with systemic lupus erythematosus and resultant end-stage renal disease was referred for evaluation of hypotension and hypovolemia. She had recently begun hemodialysis. On physical examination, it was noted that the fingernails had an unusual appearance (Figure). Abnormal laboratory study results included a serum creatinine level of 1025 µmol/L (11.6 mg/dL) and a serum urea nitrogen level of 32.13 mmol/L (90 mg/dL).

From the Department of Pediatrics, The Johns Hopkins University School of Medicine, Baltimore, Md (Drs Cabana and Ensor); and the American Board of Pediatrics, Chapel Hill, NC (Dr Tunnessen).
Half-and-Half Fingernails

The white proximal portion of the fingernails is sharply delineated from the distal brownish portion.

Abnormal fingernails may be pathognomonic of systemic disease. In chronic renal failure, the half-and-half fingernail is an occasional but extremely specific finding. It is estimated that up to 40% of patients with renal insufficiency have half-and-half fingernails during the course of their disease. The characteristics were first described by Bean who, in 2 patients with renal failure, recognized the condition as a dark distal band occupying 20% to 60% of the total nail contrasted with a white portion resembling ground glass. Although Bean originally described the distal portion as red or slightly orange, the color can also be brown. The condition has also been observed in toenails, but it is most common in fingernails.

No studies document the prevalence of half-and-half nails in children. The youngest patient documented to have this condition was 22 years of age. There is no known relationship between the band width and the degree of renal failure, proteinuria, or the concentrations of serum creatinine, serum urea nitrogen, total protein, or albumin. In one report, the abnormalities disappeared over several months after successful cadaveric renal transplantation, but were unchanged by hemodialysis.

PATHOGENESIS

Leyden and Wood proposed that the discoloration was secondary to melanin deposition, based on the results from nail biopsy. They hypothesized that renal failure led to acidosis and uremia that stimulated nail matrix melanocytes to produce melanin. The associated slow growth of the nail in renal failure also exacerbated the resulting discoloration. Others postulated that changes in the nail bed rather than in the nail were responsible for the discoloration and patterns. Specifically, they attributed the changes to an increase in the number of capillaries and a thickening of the capillary walls in the nail bed.

SIMILAR NAIL CHANGE

A similar finding that is nonspecific for renal disease is Terry nails, first described in 1954. Terry nails have a distal pink-to-brown transverse band, 0.5 to 3 mm wide, a proximal white or light pink nail, and may have a lunula. Unlike half-and-half nails, which are specific to renal disease, Terry nails are associated with aging in general. Disorders such as cirrhosis, chronic congestive heart failure, and adult-onset diabetes may expedite the development of Terry nails.

Another onychopathologic finding specific to renal disease is triangular lunulae associated with the nail-patella syndrome. Nail abnormalities that occur in patients with renal failure but that are not specific to the disease include splinter hemorrhages and slow nail growth. Although Mee lines are classically associated with arsenic poisoning, the transverse white bands have also been seen with chronic renal failure.

The variety of nail abnormalities in patients with renal disease suggests that routine nail inspection is an important part of the physical examination and can assist in the diagnosis of the disease.

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REFERENCES


The Editors welcome contributions to Pathological Case of the Month, Picture of the Month, and Radiological Case of the Month. Those who wish to contribute should send their manuscripts to Dr Gilbert-Barness (Pathological Case of the Month), Department of Pathology, Tampa General Hospital, University of South Florida, Davis Island, Tampa, FL 33606; or Dr Tunnessen (Picture of the Month), The American Board of Pediatrics, 111 Silver Cedar Ct, Chapel Hill, NC 27514-1651; or Dr Wood (Radiological Case of the Month), Department of Radiology, Childrens Hospital Los Angeles, 4500 Sunset Blvd, Los Angeles, CA 90027. Articles and photographs accepted for publication will bear the contributor’s name. There is no charge for reproduction and printing of color illustrations.