Osteomyelitis of Both Femora in a Patient on Maintenance Hemodialysis with Severe Uremic Osteopathy*

B. Krempien and E. Ritz
Pathologisches Institut der Universität Heidelberg (Direktor: Prof. Dr. W. Doerr) und Medizinische Universitätsklinik Heidelberg (Direktor: Prof. Dr. G. Schettler)

Received March 13, 1972

Summary. The case is reported of a 29 y. old woman with chronic renal failure and severe azotemic osteopathy treated by maintenance hemodialysis. At autopsy bilateral symmetrical osteomyelitis of the medial cortecals of both femoral diaphyses was found. Osteomyelitis was associated with large, partially penetrating cortical sequesters, and the formation of involucra and cloaca. The coincidence of azotemic osteopathy with osteomyelitis in patients kept on maintenance hemodialysis has not been reported so far. An increased rate of bone remodelling and an enhanced skeletal blood flow as a consequence of uremic metabolic bone disease is thought to raise the risk of hematogenous osteomyelitis. The symmetrical localization in both femora may be due to a local increase of bone remodelling where the riders muscles insert (caused by an altered tonus of riders muscles in uremic myopathy) or in stress zones from bending stress of the femora.

Although histological, roentgenological and clinical signs of bone disease are rather frequent in patients undergoing chronic hemodialysis (Krempien et al., 1971; Ritz et al., 1971), gross skeletal destructions or deformities are distinctly rare. In the following we report the case of a 29 years old female patient in terminal renal failure who was kept on hemodialysis for two years. At autopsy severe azotemic osteitis fibrosa and osteomalacia was found. In addition, however, both femora were partially destroyed by chronic osteomyelitis and showed symmetrical gross sequesters in the diaphyseal region with typical involucra and cloaca formation. Since in uremia similar cases have not been described so far, etiology and pathogenesis of this rather unusual skeletal finding shall be discussed.

Case Report

a) History. 29 years old female. 1955 in the age of 15 scarlet fever and nephritis. Chronic renal insufficiency since march 1966. Maintenance hemodialysis since february 1968. Bilateral

* Supported by Deutsche Forschungsgemeinschaft.
nephrectomy on 8. 5. 1969. At this time severe secondary hyperparathyroidism. On 12. 3. 1970 subtotal parathyroidectomy because of extreme skeletal changes. On histology the parathyroid glands showed diffuse hyperplasia.


c) Skeletal Changes. In the proximal diaphysis of both femora we found symmetrical, partly penetrating cortical sequestrums with involuera and cloaca formation (Fig. 1a and b). The large cortical sequestrums were totally necrotic and were partially resorbed by multinucleated osteoclasts. Foci of chronic osteomyelitis were found in both femora in fibrous scar tissue. The vital compacta showed extreme spongiosation (Fig. 2 and 3). Iliac crest biopsy, obtained

Fig. 1a and b. Longitudinal section of the right (a) and left (b) femur. Symmetrical gross cortical sequestrums of both femora with formation of involuera and cloacae due to bilateral partially penetrating osteomyelitis of the proximal diaphyses