Medial artery calcification (MAC), which has been increasingly recognized in ESRD patients, has been associated with calcific uremic arteriolopathy (calciphylaxis) and with ischemic changes of the distal extremities. This report describes a 50 year-old hemodialysis patient with MAC who developed clinical features mimicking the findings of temporal arteritis. He presented with a 2 month history of bilateral temporal area headaches with associated symptoms of blurry vision, arthralgias in shoulders, hips, and knees and intermittent symptoms consistent with jaw claudication. ESRD was 2° to hypertension requiring dialysis in 1990, cadaveric kidney transplantation in 1994 with return to hemodialysis in 1998 after allograft failure due to chronic rejection. Medications included labetalol, nifedipine, and sevalamer. He was not receiving calcium or vitamin D supplements, and had been non-compliant with dialysis attendance, dietary phosphate restriction and use of sevalamer. Physical examination revealed a 56 kg male with blood pressure 180/80 mmHg. Superficial temporal arteries were dilated, tortuous, nodular, and tender to palpation. Ophthalmologic examination was unremarkable, except for the presence of peripapillary atrophy. Visual acuity was intact. Positive Osler’s test was present in both radial arteries. Laboratory examination revealed persistent hyperphosphatemia and normocalcemia with time averaged calcium x PO$_4$ products ranging from 70 to 80. Intact PTH was 1128 pg/ml (normal <65 pg/ml). Hematocrit 33%, white blood cell count 9100/mm$^3$, C-reactive protein 3.3 mg/L, and ESR 101 mm/hr. Radiographic studies of the hands demonstrated extensive small vessel vascular calcifications. Based on clinical and laboratory findings, methylprednisolone was administered, and temporal artery biopsy was performed. Pathologic changes included medial artery calcification with mild inflammatory changes. No giant cells were identified. Based on these findings, steroid therapy was discontinued. Parathyroidectomy was recommended, but declined by the patient. Treatment initially included daily dialysis to control hyperphosphatemia, and efforts to improve compliance with dietary PO$_4$ restriction and use of PO$_4$ binder (sevalamer). During follow up there has been no change in visual acuity. Additional long-term complications of MAC have included the development of painful ischemic ulceration of the glans penis and extensive mitral annulus calcification, detected by echocardiography. These findings represent additional clinical manifestations of MAC associated with ESRD that can mimic other vascular diseases.