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Case Report

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Iliac Bone Perforation in a Patient on Hemodialysis

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Abstract

We report severe bone resorption with iliac bone perforation and vascular calcification due to longstanding hyperparathyroidism in a 60-year-old male patient who had undergone hemodialysis for 16 years. Computed tomography images were obtained following a complicated hemodialysis catheterization of the femoral vein, and unprecedented bone findings were observed. Improper management of chronic kidney disease–mineral bone disorder can lead to severe consequences, as observed in the present patient.

Keywords: CKD-MBD, bone perforation, vascular calcification, chronic hemodialysis, computed tomography

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INTRODUCTION

Chronic kidney disease–mineral bone disorder (CKD-MBD) is a complex syndrome that has both skeletal and extraskeletal manifestations. The gold standard for the diagnosis of renal osteodystrophy is bone biopsy, which reveals categorically high bone turnover (osteitis fibrosa cystica), low bone turnover (adynamic bone disease), abnormal mineralization (osteomalacia), or a mixture of these diseases (mixed uremic osteodystrophy) (1). However, the issue is not limited to bone disorders, and because the disease is invasive and patient follow-up using bone biopsy is expensive, detecting alterations in biochemical parameters (such as changes in serum phosphorus, calcium, parathyroid hormone, vitamin D, and fibroblast growth factor 23 levels) has become the cornerstone of the current management and diagnosis, although this has led to some compromises in the correct diagnosis and treatment (2). The risk of morbidity and mortality that is associated with CKD-MBD is conceivable; however, it may be difficult for an inexperienced eye to identify this risk (3). We herein report the case of a patient with exceptionally dramatic skeletal and vascular findings due to CKD-MBD.

CASE PRESENTATION

A 60-year-old man who had been undergoing a maintenance hemodialysis program for 16 years was admitted to the hospital for left arteriovenous fistula failure. The patient had a history of multiple arteriovenous fistulae, hemodialysis catheterizations, and a longstanding tertiary hyperparathyroidism (for which he refused any attempt for parathyroidectomy or calcimimetic therapy). A tunneled hemodialysis catheter was inserted via his left femoral vein without any apparent complication. However, painful distention developed on the left inguinal area 1 day later, and intravenous contrast-enhanced computed tomography (CT) revealed bleeding from the left common iliac vein. A three-dimensional reconstruction of the CT images showed widespread severe bone resorption, which was most prominent within the pelvic bones

and trabecular areas of the long bones; severe calcifications of the arteries; and perforation of both the iliac wings (Figure 1). The patient's predialysis laboratory test results were as follows: leukocytes, 4.640/µL; hemoglobin, 12.1 g/dL; platelets, 171.000/µL; urea, 67 mg/dL; creatinine, 5.1 mg/dL; Na, 135 mEq/L; K, 3.9 mEq/L; Ca, 9.6 mg/dL; P, 6.4 mg/dL; albumin, 4.2 g/dL; ALP, 620 U/L; and intact parathyroid hormone (iPTH), 4707 pg/mL.

DISCUSSION

The clinical presentation of CKD-MBD mainly depends on the prevailing metabolic abnormalities, and it is characterized by laboratory abnormalities, bone abnormalities, and vascular calcification (4). Cardiovascular disease, bone fractures, and mortality are the hard endpoints in the course of CKD-MBD, and unless they occur, explaining the complexity of this disease to a patient can be difficult. The findings of excessive bone resorption and vascular calcification observed in this patient may be exceptional in terms of demonstrating the consequences of this disease. One of our concerns is that some patients lose compliance to treatment over time, often mentioning that "we have been taking all the medications for years (or months), without any noticeable benefit." Although the term "risk" is an abstract concept, the images obtained are concrete findings; therefore, we speculated whether it would be more effective to discuss CKD-MBD with the patient (for example, the present case) using such illustrations. To date, CKD-MBD does not appear curable; therefore, the prevention of the harmful consequences is pivotal, and treatment goals for serum phosphate (3.5-5.5 mg/dL), calcium (<9.5 mg/dL), and parathyroid hormone (2-9 times the upper limit of normal) levels have been established for patients on dialysis (2, 5). The current armamentarium to achieve these goals is far from being ideal because of gastrointestinal intolerance, polypharmacy, adverse effects, insufficient potency, and patient reluctance to indefinitely ingest the medicines.

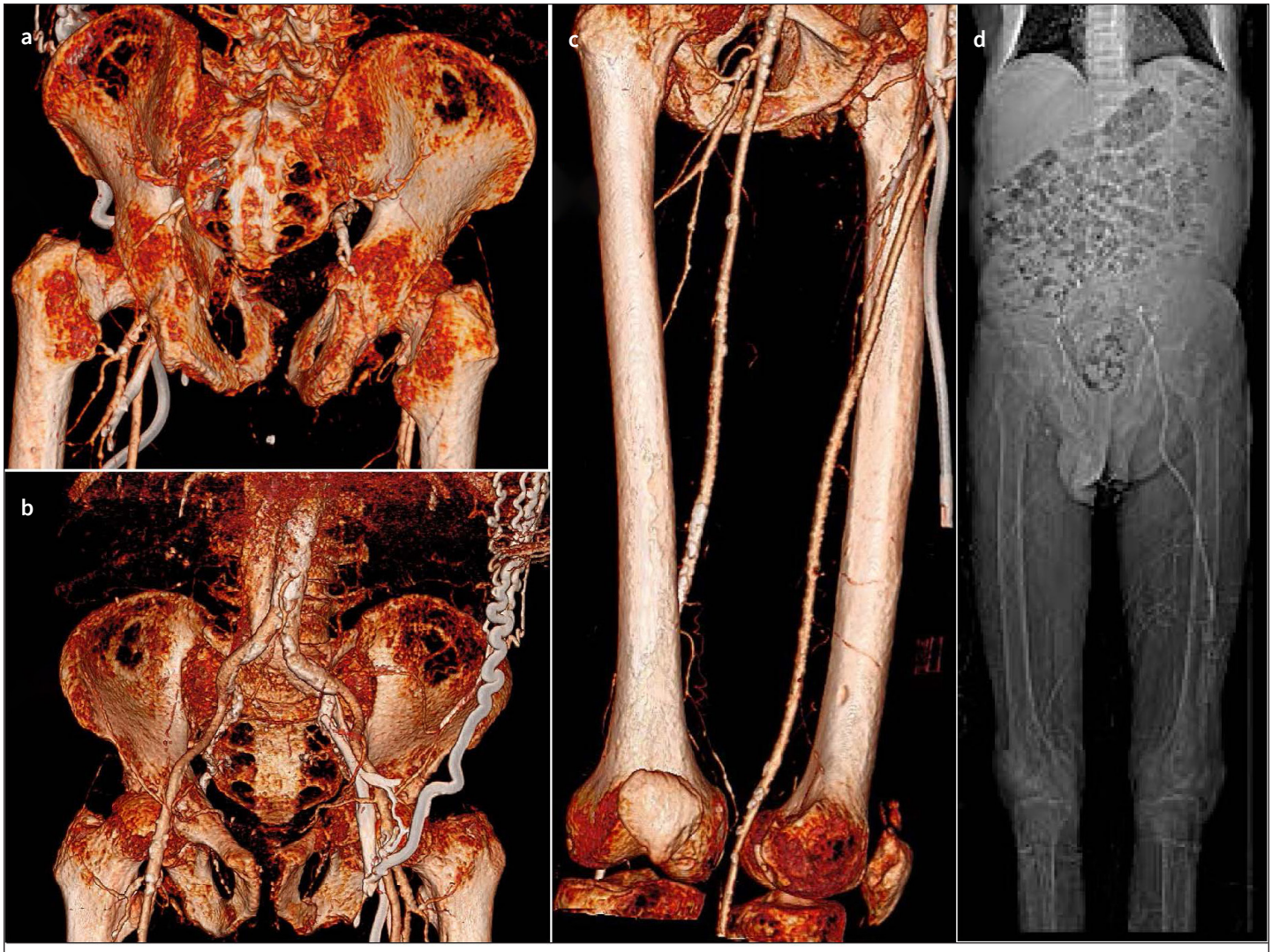

Figure 1. a-d. a) and b) Posterior and anterior views of the 3D reconstruction of computed tomography of the pelvic region shows severe bone resorption throughout the pelvic bones, vertebral processes, and femoral trochanters and necks; widening of the sacral foramina; perforation of the alae iliums; and excessive calcification of the abdominal aorta and its branches. c) 3D reconstruction of the leg area reveals severe bone resorption at the femoral and tibial condyles with an appearance similar to perforations and excessive calcification of the femoral arteries and their branches. d) An X-ray of the body shows diffuse low bone density and left femoral hemodialysis catheter.

Some patients may develop extremely high serum parathyroid hormone levels that are not suppressible with phosphate binders, vitamin D analogs, and calcimimetic agents; this condition is defined as refractory hyperparathyroidism. Hypercalcemia, refractory hyperphosphatemia, bone pain, pruritus, myopathy, and uremic calcific arteriolopathy may accompany refractory hyperparathyroidism. Parathyroidectomy is an effective treatment for refractory hyperparathyroidism, and currently, it is suggested for patients with symptomatic severe refractory hyperparathyroidism (iPTH>800 pg/mL) (5). Although randomized controlled trials to assess the outcomes of parathyroidectomy are lacking, several observational studies have shown improved survival, reduced bone fracture risk, and increased bone mineral density after parathyroidectomy (6-10). Nonetheless, immediate postoperative mortality and morbidity (2% mortality rate and 23.9% re-hospitalization rate within postoperative 30 days among 4435 Medicare patients following parathyroidectomy) are the trade-off of surgery; therefore, a thorough assessment and follow-up are the critical adjuncts to parathyroidectomy (11).

CONCLUSION

Patient refusal of treatment is an inconvenient truth of medical practice; therefore, in addition to the wealth and shortcomings of the current knowledge (12), we may have to consider strategies to share the results of sophisticated studies with the patients.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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Conflict of Interest: The authors have no conflict of interest to declare.

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