

Hypercapnic respiratory failure from skeletal deformities in renal osteodystrophy

Priyanka Bhugra^{1*} and Abhishek Maiti²

¹The Houston Methodist Hospital, Houston, TX, USA

²The University of Texas MD Anderson Cancer Center, Houston, TX, USA



Figure 1. Clinical picture, labelled image

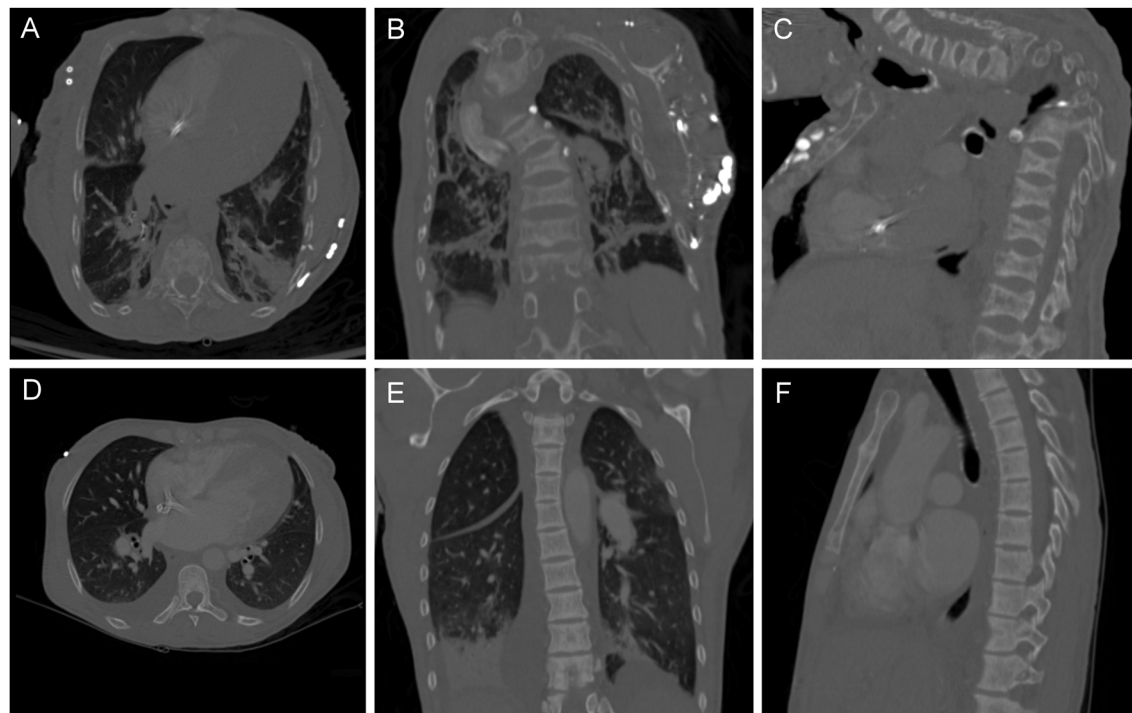


Figure 2. Clinical picture, unlabelled image

*Correspondence to: Bhugra P, MD, 1701 Sunset Blvd., Houston, TX 77005, USA, Tel: 713.526.5511; Fax: 769.207.9119; E-mail: bhugra.priyanka@gmail.com

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Clinical Image

A 40-year-old woman with end-stage renal disease (ESRD) due to lupus nephritis presented with arteriovenous graft infection. She was receiving hemodialysis 3-times a week for 13 years, but reported non-adherence to medications and dietary restrictions. Physical examination showed prominent jaw bones consistent with uremic leontiasis ossea (Figure 1A arrow heads) [1,2]. Skull radiograph also showed thickening of calvaria and classic “salt-and-pepper sign”. Hand radiographs showed diffuse demineralization and extensive acroosteolysis of the distal phalanges (Figure 1B solid arrows) and cortical tunneling (panel b dotted arrows). She also had severe kypho-scoliosis (Figure 1C) which had progressed over years (upper panels Figures 1A, 1B and 1C and Figures 2D, 2E and 2F taken 6 years apart) leading to restrictive lung disease and chronic hypercapnic respiratory failure. Her serum parathormone (PTH) level was higher than 1900 pg/mL (201 pmol/L) and serum phosphorous level was consistently above 5.5 mg/dL (1.78 mmol/L). These findings were consistent with advanced chronic kidney disease-mineral and bone disorder (CKD-MBD). She was treated with antibiotics, arterio-venous graft resection, and was discharged on sevelamer.

CKD-MBD is a systemic disease characterized by abnormalities in mineral hemostasis leading to biochemical abnormalities (serum calcium and phosphorous), endocrine dysfunction (PTH and vitamin D metabolism), anomalous bone turnover and extra-skeletal calcification [3]. It is associated with increased cardiovascular calcification, morbidity

and mortality [4,5]. Renal osteodystrophy is the skeletal component of CKD-MBD and refers to the alterations in bone morphology [6]. Since bone biopsy is invasive and expensive, circulating PTH levels are commonly used as surrogate indicator for bone turnover. Proactive management, including optimal control of serum calcium, phosphate, PTH levels and, sometimes timely parathyroidectomy can prevent such severe manifestations [3].

Over the following two years, the patient required multiple hospitalizations for hypercapnic respiratory failure needing mechanical ventilation and eventually passed away in hospice.

References

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