A 61-year-old woman reported progressively worsening bone pain in the left right, lower back and arms over a period of several months. A bone survey revealed generalized osteopenia. Laboratory investigation showed only hypophosphatemia (serum \( \text{P}_{\text{O}_4}^- \) 1.1 mg/dL) and low levels of 1.25 \((\text{OH})_2\text{D}_3\) (12 pg/mL, normal values 15–60 pg/mL).

Which is the most probable diagnosis?

a. Hyperparathyroidism  
b. Vitamin D deficiency  
c. Tumor-induced osteomalacia  
d. Hypophosphatasia  
e. Fanconi syndrome

**Comment**

A CT scan showed a lesion in the right thigh. Furthermore, an octreotide labeled scintigram showed intense focal uptake in the same region. Fractional phosphate excretion was 25% indicating inappropriate phosphaturia, while serum levels of potassium, urate and bicarbonate were within normal limits and urinalysis did not show glucosuria; thus, the diagnosis of Fanconi syndrome can be excluded. The levels of serum alkaline phosphatase were not low and this finding rules out hypophosphatasia, while the normal serum \( \text{Ca}^{2+} \) and PTH levels exclude the diagnosis of primary hyperparathyroidism. The absence of increased PTH levels can also exclude the possibility of vitamin D deficiency. The serum level of the phosphaturic hormone fibroblast growth factor (FGF-23) was markedly elevated. Thus, the patient exhibited a mesenchymal tumor-induced osteomalacia. In this disorder phosphatonin s inhibit both the renal tubular absorption of phosphate and 1α-hydroxylase enzyme that converts 15\((\text{OH})_2\text{D}_3\) to 1,25 \((\text{OH})_2\text{D}_3\).