

中文題目：肋骨骨折在年輕男病患一個非典型的表現在維生素 D 缺乏導致軟骨症病患身上  
英文題目：Ribs Fracture in A Young Man: An Uncommon Presentation of Vitamin D Deficiency  
Osteomalacia

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**Background:** Osteomalacia is a severe mineral bone disease, and is uncommon now because of good nutrition status except bypass surgery. However, there was no report of the association of bariatric surgery and osteomalacia. We reported a young diabetic, severe obesity patient who received bariatric surgery. He suffered from flailed chest, and L-spine compression fracture about 6 months after the surgery. After complete examination, Fanconi syndrome or tumor induced osteomalacia were excluded. Osteomalacia was diagnosed by low 25(OH)-Vitamine D3 and normal Ca/P excretion. He was in stable condition after using active 1,25(OH)-Vitamine D3, Calcium carbonate and biphosphate.

**Case Report:** The 37 year-old male with type 2 diabetes presented with a 1-year intermittent chest pain. He denied chronic cough or trauma. Trace his history, he received laparoscopic sleeve gastrectomy for severe obesity about 2 years ago. The surgery was successful in reducing about 40kg. Complete history survey and physical examination were unremarkable. He denied any family history of bone disease. In admission, chest X-ray showed the rib cage appears old fracture of multiple both ribs, and old fracture of left distal clavicle was also seen (looser zones, black arrow; and pseudo-fracture, white arrow in figure 1). The L-spine MR image revealed compression fractures at L3-L5 spine (figure 2). The initial chest X-ray and blood phosphate level before surgery showed normal. Bone densitometry suggested osteopenia (T-score: -1.86 SD). The lab series showed serum Ca 8.6 mg per deciliter, serum phosphate 2.6 mg per deciliter, urine phosphate 20.6 mg per deciliter, intact PTH 71.1 pg per milliliter, and TmP/GFR was 0.57 mmol per liter (normal 1.00-1.35 mmol per liter) which showed hypophosphatemia because of renal phosphate wasting. The 25-Hydroxy Vitamin D3 levels was insufficiency (18 ng per milliliter), no excessive urine bicarbonate, aminoaciduria or glucosuria were seen. Oncogenic osteomalacia was excluded by normal Fibroblast growth factors 23 (FGF 23) and FDG Positron Emission Tomography (PET/CT) scan (figure 3). Vitamin D deficiency Osteomalacia associated multiple ribs and spine fracture were diagnosed. The patient recovered substantial and phosphate level up to 3.3mg per deciliter under therapeutic doses of active vitamin D3 and calcium carbonate.

**Conclusion:** Bariatric surgery is a treatment of choice for severe obese type 2 diabetes patients in American Diabetes Association (ADA) 2016 Guidelines.<sup>1</sup> Among bariatric surgeries, laparoscopic sleeve surgery was originally thought as restrictive procedure, it can also induce clinically relevant vitamin D deficiency.<sup>2</sup> Vitamin D deficiency related osteomalacia and multiple ribs fracture in young patient is a rare finding in anorexia nervosa induced severe malnutrition.<sup>3</sup> Differential

diagnosis of this presentation is tumor induced osteomalacia, a rare paraneoplastic syndrome in which patient presents with bone pain. In addition, clinical and serological manifestations confirmed the diagnosis of Vitamin D deficient osteomalacia after laparoscopic sleeve surgery.

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