Chronic Back Pain in Elderly: Radiological Diagnosis

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Received: 3 August 2020

Accepted: 8 October 2020

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DOI 10.5001/omj.2021.79

Case

A 65-year-old female presented with chronic back pain to our center after being treated elsewhere for two months with little improvement. She had a history of trivial injury some eight months back when she received treatment and became ambulatory. But, for last 3 months she was having difficulty in being supine and her pain and discomfort was obvious. We investigated her with a plain the x ray and loading films (x -ray in supine and sitting posture) showed there is collapse which was opening up suggestive of void at D12 level. A computed tomography (CT) was done which confirmed a "vacuum sign" seen on coronal and axial cuts. The magnetic resonance imaging (MRI) also showed an edema at that particular level. Routine laboratory and work up to rule out infection or malignancy was negative in this case. The patient underwent a single level kyphoplasty (KP) under anesthesia. On following day visit, her pain score (visual analogue score) had tremendously improved from 8 to 1. The check x-ray and CT scan showed satisfactory cement filling and height restoration. She received anti-osteoporotic treatment and is currently doing well at one year follow up

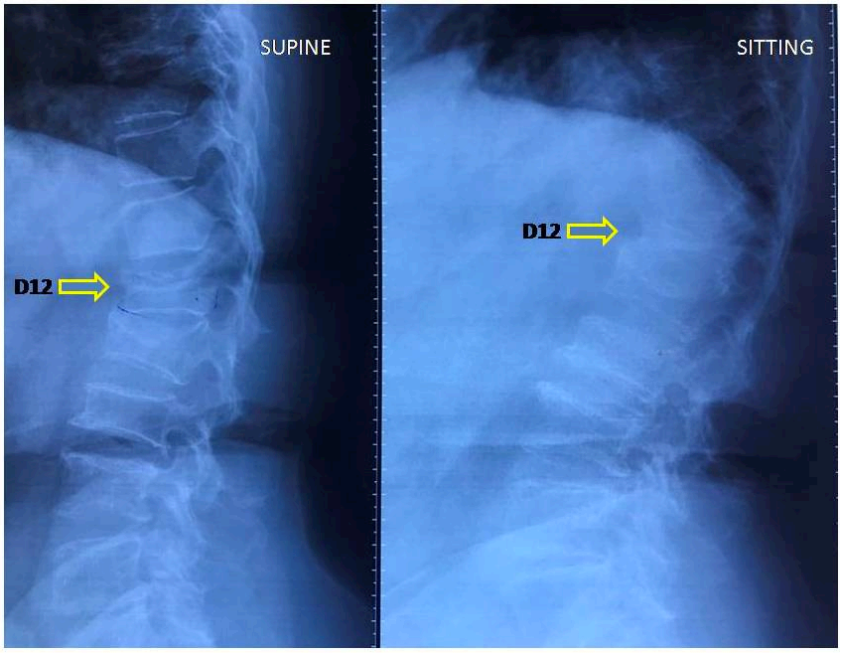

Figure 1- loading x-ray shoeing inter-vertebral collapse (arrow)

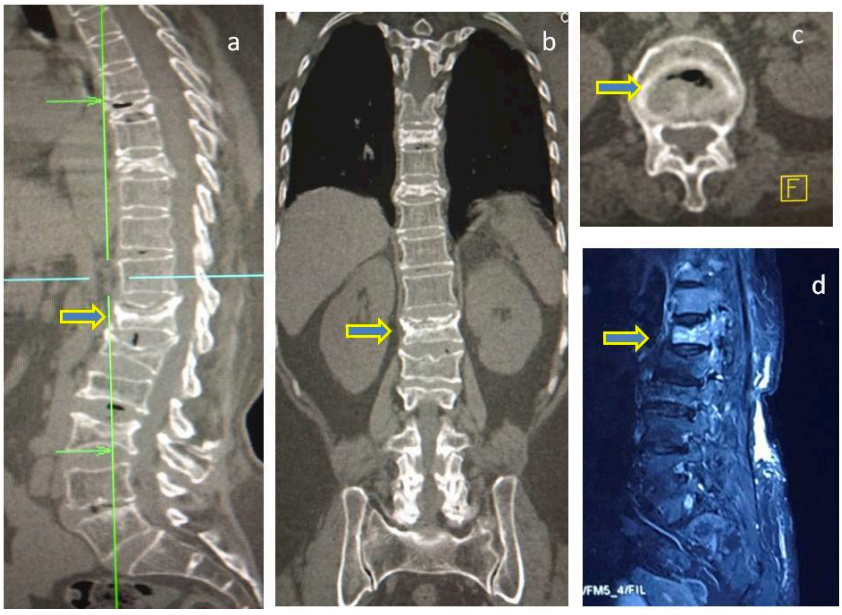

Figure 2- CT scan showing the intervertebral cleft in sagittal, coronal (a, b- arrow) and vaccum in axial cuts (c-arrow). Fat suppressed MRI showing the affected vertebrae with patchy edema.

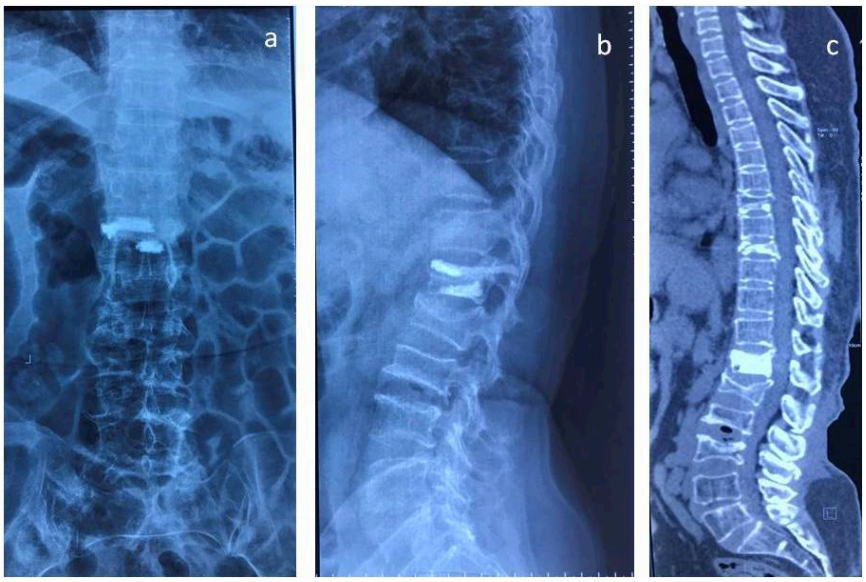

Figure 3- post operative x-ray in (a,b - antero-posterior and lateral) showing filling and restoration of height following kyphoplasty. CT scan demonstrates better delineation of cement augmentation as seen in c.

What is the diagnosis?

1. Kummel disease
2. Scheuermann disease
3. Apophyseal ring fracture
4. Bertolotti syndrome

Answer- a- Kummell's disease

Kummell's disease (KD) is late onset vertebral osteonecrosis following a compression fracture described way back in 1895 by German surgeon Herman Kummell.[1] The pathology is a failure of the healing mechanism of fracture resulting in avascular zone that develops below the endplate.[2] It is seen usually months after a trivial injury in an elderly patient having osteoporosis or in a younger person with chronic steroid use or exposure radiation or known alcoholic.[2, 3] Patients are often mobile without neurology but mainly present with chronic debilitating back pain of > 3 months duration. Plain lateral loading radiographs / dynamic views best illustrate the "pseudoarthrosis" that is optimum for diagnosis (3). The pathogmonic "air-filled cleft" is best demonstrated in CT though MRI can slow a "double line sign," (a region of low intensity surrounded by higher intensity signal.[4, 5] Management of KD is eliminating the abnormal motion at the pseudoarthrosis site and thus relieves pain. No operative management are therefore not found with much success. Percutaneous vertebral cement augmentation (VCA) by either kyphoplasty (KP) or vertebroplasty (VP) provide excellent and immediate pain relief in neurologically intact patient.[2] Those who have a cord compression features shall need an additional stabilization and posterior decompression in addition to these cement filling methods due to lack of healing potential of the fracture.[2] However, these benign lesions must be differentiated from the malignant compressive fractures. Although contrast enhanced MRI is helpful in most cases, the 18F-fluorodeoxyglucose positron emission tomography is more dignsostic but limited by availability. Recently, the Diffusion tensor imaging has been the game changer in segregating the benign from malignant. Malignant vertebral marrow involvement show a higher fractional anisotropy and lower mean diffusivity as compared to benign disease.[6]

Bertolotti's syndrome is a condition pain associated with transition vertebras either as sacralization of the fifth lumbar vertebra or vice versa.[6] The disease is commonly overlooked in the evaluation and treatment of lower back pain since prevalence of transition vertebrae remains (4 -30% in general population) common yet, rarely its associated with lower back pain.

Scheuermann kyphosis or the Scheuermann disease is a juvenile kyphosis involving the thoracic and rarely the lumbar in adults associated with hyperkyphosis, successive three vertebral wedging up to 5 degrees and discogenic changes.[7] It is more of a cosmetic deformity as "hunchbacked" appearance but can be painful requiring conservative or surgical treatment..

Apophyseal ring fractures are rare injuries mimicking the common disc herniation though sometimes can be accompanying them.[8] It is again seen in adolescent age but can be found in adults of various age group that frequently require a surgical procedure failing conservative treatment.

Our patient received symptomatic treatment in form of KP along with primary management of osteoporosis. The x-rays / CT scans also shows some healed vertebral fractures (no hyper intensity on T2 weighted/ STIR MRI) at multiple levels. These healed fractures are usually “silent” (asymptomatic) but can cause local kyphosis and if multiple levels can lead to sagittal imbalance.[10]

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