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Case Study

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KUMMELL DISEASE: AVASCULAR NECROSIS OF VERTEBRAL BODY: A CASE REPORT

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ABSTRACT

Kummell disease is a condition of avascular necrosis which is due to failure of the fracture healing process after minor traumatic injury. This rare disease is increasing due to increase in aging population and associated rise in osteoporosis. Vertebroplasty, surgical compression and fusion often requires as treatment. We present a typical case of Kummell disease with its salient features and associated imaging findings on CT and MRI.

KEYWORDS:

Due to advances in healthcare, life expectancy in India has increased resulting to increase in geriatric population. Naturally, the geriatric population are having osteoporotic changes in their skeletal system. When osteoporosis is pronounced in vertebral column it gives rise to severe chronic conditions. Backache, being most prominent of all presenting complaints which takes sometime much more time in diagnosis and further management. Cases with trivial injuries may present with vertebral compression fractures. As a result of compression fracture, nutrition of the vertebra is affected resulting in non-union. In cases where there is accumulation of fluid or air within the fragments, the condition becomes chronic and aggravating. This type of pathology occurs few weeks or months after the trivial injury in already osteoporotic vertebra.

Clinical history: We had examined such a female case aged 85 years who had a trivial injury few weeks back and coming to OPD with nagging backache after 4 weeks. It radiates to bilateral lower limbs with radiculopathy.

Imaging findings

We have done CT scan and subsequently MRI was also performed for further evaluation of the condition.

Computed tomography (CT) imaging of the spine showed a compression fracture of T12 vertebral body causing gross reduction in vertebral height predominantly anteriorly with associated intravertebral vacuum cleft. Posteriorly, the fracture fragments are causing narrowing of the spinal canal. Few intradiscal air foci also noted at T11-T12 level. (Figure 1)

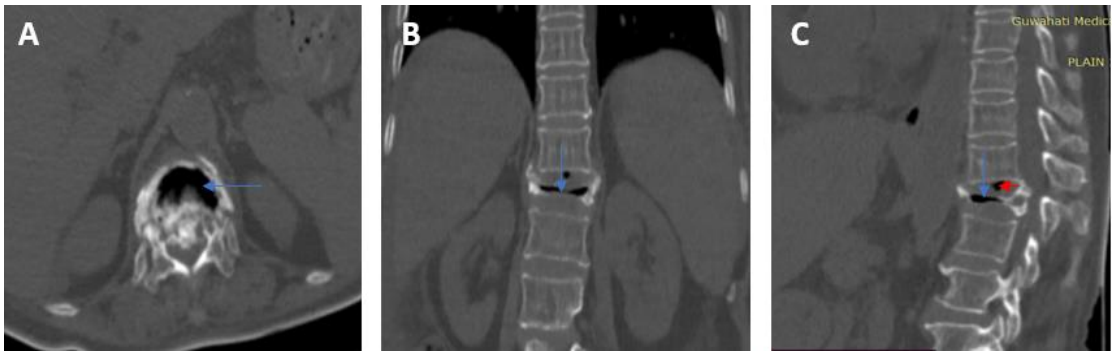

Figure 1: (a) axial, (b) coronal and (c) Sagittal and CT images of the spine show marked anterior compression deformity of the T12 vertebral body with intravertebral vacuum cleft (blue arrow). Few intradiscal air foci also noted at T11-T12 level (red arrow).

Magnetic resonance imaging (MRI) of the spine revealed compression fracture of the T12 vertebra with intravertebral signal void within in all MR imaging sequences (T1, T2 and STIR).

The retropulsed posterosuperior bony fragment is stretching the PLL and compressing the cord conus complex with resultant spinal canal stenosis. (Figure 2)

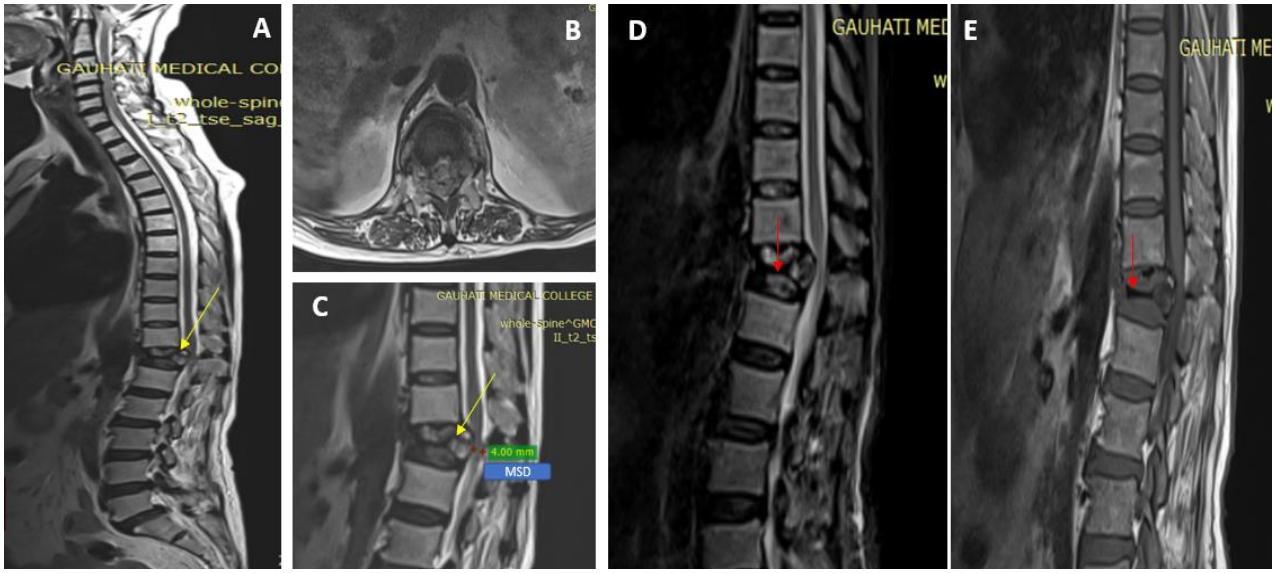

Figure 2: MR images of a patient with Kummell disease: (A) Sagittal T2WI whole spine, (B) axial T2WI, (C) sagittal T2WI, (D) sagittal STIR (short TI inversion recovery) and (E) sagittal T1-weighted images show compression fracture of T12 vertebra with posterosuperior fragment elevating the PLL and causing cord conus complex compression and resultant spinal canal stenosis. (MSD: Mean sac diameter) All the MRI sequences show absence of the signal within the vertebral body vacuum cleft (red arrow).

DISCUSSION

In the same year of invention of X-ray in 1895, a German surgeon Hermann Kummell described 6 patients with vertebral body compression deformity following minor trauma. Kummell hypothesized that, the whole pathogenesis develops from the fact that the nutrition of the vertebral body/bodies are affected after the injury leading to delayed collapse of vertebral bodies.[1,2] Kummell disease earlier thought to be exceedingly rare is now increasing in prevalence with our aging population as we have mentioned earlier. The exact incidence of the Kummell disease in India is yet unknown. There is also disagreement about the name as Kummell disease and Kummell-verneuil disease are being applied to the same condition.[2]

Kummell disease in fact is a condition of avascular necrosis which is due to failure of the fracture healing process after minor traumatic injury.[3] Imaging immediately after the inciting injury shows no evidence of compression deformity or acute fracture. However, initial imaging are not usually done due to already evident trivial nature of the traumatic event from the history. Mild kyphosis develops due to involvement of the lower thoracic and upper lumbar vertebra necessitates investigation. Similarly, in our case we did imaging including CT and MRI and finally come to imaging diagnosis of Kummell disease. Neurological compression is quite common with the Kummell disease leading to neurological symptoms. Treatment options are design to eliminate the motion at the fracture site for relieving neurologic symptoms. Preferred management depends on three factors.

(a) Patient subjective pain level,
(b) Degree of kyphotic deformity and
(c) Specific neurologic deficit.[1]

Vertebroplasty has shown promising results and successfully alleviates the backpain. Surgical compression and fusion can be planned from anterior, posterior or combined approaches for obtaining a proper anatomic sagittal alignment which eliminates pathologic motion.[4,5]

Further research and multicentric investigation is highly needed to explore the exact dimension of this problem in our aging population who remained active in physical activities.

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