Vertebral pneumatocysts

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Section: Musculoskeletal system
Area of Interest: Spine
Procedure: Diagnostic procedure
Imaging Technique: CT
Imaging Technique: MR
Imaging Technique: Digital radiography
Special Focus: Cysts Case Type: Clinical Cases
Authors: Ahmed Abdrabou MD, FRCR1, Saad Alqahtani MD, FMH, EBIR2, Ahmed Kandeel MD, M Sc, Doctoral Degree2, Mohamed Aboushady, MB Bch, M Sc2
Patient: 49 years, female

Clinical History:

A 49-year-old woman complained of long standing neck pain and recently developed left brachialgia. Plain radiograph revealed degenerative changes and MRI was recommended to rule out nerve root compression.

Imaging Findings:

The patient underwent MRI which revealed few well-defined variable-size rounded lesions at C3, C4, C5 and C6 vertebral bodies that displayed low signal on T1 and T2-weighted images. They were initially interpreted as sclerotic lesions, possibly multiple bone islands or sclerotic metastases. Going back to the cervical radiograph, we did not find sclerotic lesions, but there were lucent areas at the site of the lesions. CT was planned for further characterization and revealed a few air-filled cysts of variable size within the vertebral bodies, the largest one seen at C5 vertebral body. Their average density ranged from -800 to -900 HU. At least three of the lesions showed possible communication with the vertebral end plates and intervertebral discs; however, there was no communication with the spinal canal. Nevertheless, the intervertebral discs showed air inside (vacuum phenomenon).

Discussion:

Vertebral pneumatocyst is a rare condition consisting of a gas-filled cavity within the vertebral body, usually affecting the cervical spine. While presence of intra-osseous gas is common in certain locations, e.g. ileum and sacrum adjacent to sacroiliac joints, the spine is rarely affected and only few cases were reported so far [1, 2]. Other pathologies that are associated with intravertebral air, e.g. osteomyelitis, osteonecrosis (Kummel disease), necrotic neoplasm, post-traumatic and post-surgical sequel should be excluded first before diagnosing idiopathic pneumatocysts [3]. The pathogenesis and natural course are not completely understood. Yamamoto et al. reported a case of cervical pneumatocyst that, on follow up, changed to fluid-filled cavity and was replaced by granulation tissue later on [4]. Kitagawa et al. reported another case of cervical pneumatocyst that enlarged over 15 months on follow-up. Moreover, they illustrated a communication between the cyst cavity and the vertebral end plates [5]. In our case, a few cysts showed a possible communication between the cysts and the vertebral end plates underlining the hypothesis by Karasick et al. that the gas is formed first in the intervertebral discs and secondarily enters the vertebral body through a defect in degenerated end plates [6]. The location of the cysts adjacent to the vertebral end plates is another supporting point. The multiplicity of the cysts and the association with spinal degenerative changes are well documented in our case as well as in previous literature. CT is the preferred modality for correct diagnosis.
The condition is believed to be benign and requires no specific treatment. The patient was advised to undergo regular follow-up radiographs to detect any change in the size of the lesions.

**Differential Diagnosis List:** Vertebral pneumatocysts, Osteonecrosis, Osteomyelitis, Post-trauma or surgery

**Final Diagnosis:** Vertebral pneumatocysts

**References:**


Description: Black arrows refer to well-defined rounded lucent areas at the posterior aspect of vertebral bodies adjacent to vertebral end plates. Origin: Ahmed Abdrabou, Saad Alqahtani, Ahmed Kandeel, Department of Radiology, King Fahad Armed Forces Hospital, Southern Region, Khamis Mushayt, Saudi Arabia
Description: CT cervical spine sagittal reformatted image (a) and axial cut (b) show several air-filled cysts within the vertebral bodies as indicated by black arrows. Note the air within the intervertebral discs (arrowheads). Origin: Ahmed Abdabou, Saad Alqahtani, Ahmed Kandeel, Department of Radiology, King Fahad Armed Forces Hospital, Southern Region, Khamis Mushayt, Saudi Arabia
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Description: Magnified images show possible communication between the cysts and the air within the intervertebral discs Origin: Ahmed Abdrabou, Saad Alqahtani, Ahmed Kandeel, Department of Radiology, King Fahad Armed Forces Hospital, Southern Region, Khamis Mushayt, Saudi Arabia
Description: Sagittal T1 WI. The white arrows refer to hypointense lesions on T1 and T2 WI within vertebral bodies representing air-filled cysts. Origin: Ahmed Abdrabou, Saad Alqahtani, Ahmed Kandeel, Department of Radiology, King Fahad Armed Forces Hospital, Southern Region, Khamis Mushayt, Saudi Arabia
Description: Sagittal T2 WI. The white arrows refer to hypointense lesions on T1 and T2 WI within several vertebral bodies representing air-filled cysts. Origin: Ahmed Abdrabou, Saad Alqahtani, Ahmed Kandeel, Department of Radiology, King Fahad Armed Forces Hospital, Southern Region, Khamis Mushayt, Saudi Arabia