

INTRODUCTION

Pneumorrhachis (PR) describes the rare presence of intraspinal air, mainly following traumatic or iatrogenic procedures.

PR rarely manifests in neurological deficits and usually resolves spontaneously without recurrence, with air being passed directly into the bloodstream.

Here, we report a case of external PR occurring spontaneously (without any underlying trauma or surgical interventions) manifesting as neurological deficits.

Case Presentation

A 62-year-old male diabetic patient with a history of chronic low backpain presented with the chief complaint of numbness in his perineal region mainly on the left side. No bowel or urinary symptoms were noted. There was no history of recent or past trauma, prior spinal injections, or surgery.

Upon MRI and CT in 2018 and 2019 respectively, degenerative changes in the lumbar spine were observed, including end plates and discs, with associated intervertebral disc space vacuum phenomenon (Figure 1). The CT additionally showed an air locule present in the epidural space at L5-S1 levels (Figure 1). A diagnosis of external pneumorrhachis was made.

A follow-up MRI performed in May 2020 upon exacerbation of pain symptoms revealed an increase in the size of the air locule, measuring 1.5x2cm postero-centrally and in the left paramedian location at L5-S1 levels, compressing the cauda equina (Figure 2). The other disc-related changes with mild bilateral foraminal compressions at multiple levels were relatively stable in comparison to previous imaging findings (Figure 2).

Our patient was managed conservatively on a nonsteroidal anti-inflammatory agent and was advised for regular follow-ups. No aspiration or surgery have been performed to date

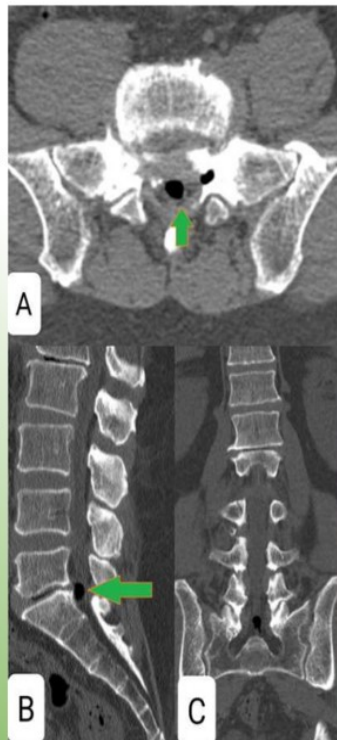


Figure 1:

Title: CT scan

Legend: Axial (A), Sagittal (B) and Coronal (C) CT scan images reveal degenerative changes in the lumbar spine, and vacuum phenomenon at L1-2 and L5-S1 levels with facets joint degenerative changes in L5-S1 level. There is an air density seen in the intraspinal region at L5-S1 level. Reduced intervertebral disc space seen at L1-2 and L5-S1 levels.

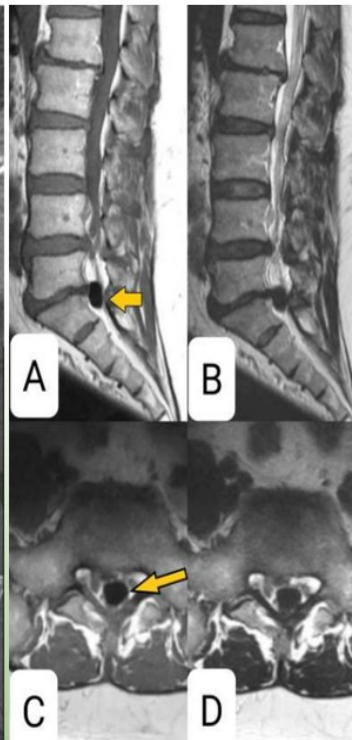


Figure 2:

Title: MRI

Legend: Sagittal T1 (A), T2 (B) and Axial T1 (C), T2 (D) weighted sequences show low signal intensity in all the sequences in the epidural space compressing the cauda equina. Attenuated CSF signals seen in the spinal canal. Degenerative changes seen in multiple levels.

Discussion

PR occurs from the vacuum phenomenon either by (1) gas-containing herniated disc fragments or (2) purely gaseous collections in the epidural space, the latter of which is more prevalent among aging populations – attributed to degenerative disc disease [1,2]. In either case, the clinical manifestations are identical to real hernias.

Since PR is usually asymptomatic and has protean manifestations, imaging is necessary for a diagnosis [2]. CT, the investigation of choice, reliably shows degenerative changes, osteophytes, disc calcifications, vacuum phenomenon, and PR [1–3]. MRI is less beneficial in spontaneous PR as gas shows low intensity signals, making it hard to distinguish from calcifications which are also of low intensity signals on all MR sequences [3].

Learning outcomes

In the case presented here, PR developed spontaneously manifesting as neurological deficits. There were no traumatic or iatrogenic procedures to explain what caused Pneumorrhachis; also, PR is very rarely symptomatic.

Imaging findings suggest that air trapped inside the intervertebral disc (VP) secondary to age-related degenerative changes was responsible. Air was likely expelled out through a weakness in the annulus fibrosus facilitated by motion of the spine.

Therefore, we propose that spontaneous PR accompanying the vacuum disc phenomenon be considered in the differential for radicular symptoms, especially with increasing age.

References

- [1]Coulter B. The spectrum of vacuum phenomenon and gas in spine. J Belge Radiol 2004;87:9-16.
- [2]Oertel MF, Korinth MC, Reinges MHT, Krings T, Terbeck S, Gilsbach JM. Pathogenesis, diagnosis and management of pneumorrhachis. Eur Spine J 2006;15. <https://doi.org/10.1007/s00586-006-0160-6>.
- [3]Kakitsubata Y, Theodorou SJ, Theodorou DJ, Yuko M, Ito Y, Yuki Y, et al. Symptomatic epidural gas cyst associated with discal vacuum phenomenon. Spine (Phila Pa 1976) 2009;34:E784-9. <https://doi.org/10.1097/BRS.0b013e3181b35301>.