Mystery Case: Pneumorrhachis
A radiographic diagnosis

A 29-year-old man presented with a penetrating injury in the posterior aspect of his neck. His vital signs were stable. On plain CT head and neck, pneumorrhachis along with air in subcutaneous plane was seen (figures 1 and 2).

Pneumorrhachis is a rare and usually missed radiographic finding in a patient with coincident underlying injuries and disease. Two types are seen: intradural and extradural. The etiologies are iatrogenic, traumatic, and atraumatic.1 A few rare causes follow violent coughing, forceful emesis, cardiopulmonary resuscitation, malignancy, infections, and marijuana inhalation. The pathways of air entry may be direct in the spinal canal or indirect following dissection between paraspinal soft tissue, via neural foramina and neural and vascular sheath. The patient is usually asymptomatic, but may present with pain, neurologic deficits, or features of intracranial or intraspinal hypertension or hypotension. The condition is self-limiting and management is conservative. The underlying cause is to be treated.2

Corresponding (A) bone and (B) soft-tissue window axial CT images show air within the posterior cervical canal (short white arrows) and subcutaneous emphysema (long white arrows). More caudal images (C, D) show similar findings.
Figure 2  CT images

(A) Coronal and (B) midsagittal CT images show air column within the cervical spinal canal (short white arrows), findings consistent with traumatic cervical pneumorrhachis.

AUTHOR CONTRIBUTIONS
Shruti Thakur: study concept or design, drafting/revising the manuscript, accepts responsibility for conduct of research and final approval. Suresh Kumar: drafting/revising the manuscript, analysis or interpretation of data. Sanjiv Sharma: study supervision. Charu S. Thakur: study concept or design.

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The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

REFERENCES

MYSTERY CASE RESPONSES
The Mystery Case series was initiated by the Neurology® Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses were solicited through a group e-mail sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media.

All 3 respondents successfully identified the presence of air within the spinal canal, with 2 using the specific term of pneumorrhachis and the third describing “epidural pneumatois or emphysema.” Of the 2 respondents who discussed management, both correctly stated that it is conservative unless there is “cord compression,” in which case a decompressive surgery, such as laminectomy, can be considered.

The patient presented here had extradural pneumorrhachis. Intradural air, also called subarachnoid pneumorrhachis, is thought to be caused by more severe trauma and almost always is associated with pneumocephalus. In such cases, head imaging is warranted, with careful evaluation for signs of raised intracranial pressure.

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