Unexpected Air on CT

A brief overview of cases of benign air in unusual spaces
Overview

- Identifying air in unexpected spaces on CT is important as it may be suggestive of a serious pathology in the absence of trauma such as:
  - Pneumoperitoneum – e.g. bowel perforation
  - Pneumomediastinum – e.g. esophageal rupture
  - Pneumatosis – e.g. bowel infarct.
  - Pneumocephalus – e.g. CSF leak
  - Subcutaneous gas – e.g. necrotizing fasciitis

- However it is also important to recognize when unexpected air may be benign to prevent unnecessary workup and distress.
Case 1

- 50 year old male presents to ER with 3 month history of weight loss, fever and chills. Rule out malignancy.
- CT Abdomen pelvis C+/O- was arranged.

- Results were unremarkable apart from a small locule of retroperitoneal gas tracking along the left psoas muscle.
Pneumoretroperitoneum

- Review of the sagittal reformats demonstrates degenerative disc disease and vacuum phenomenon in an adjacent intervertebral disc which likely contributed to this finding.

- It is important to note that this is a diagnosis of exclusion. The patient did not present with any history of trauma, abdominal pain, or infectious symptoms.

- If there was correlating history it is important to exclude bowel/vaginal perforation, complicated pancreatitis, and infection.
Case 2

- 30 year old high male speed MVC. Patient stable with no concerning symptoms, however trauma team was activated due to mechanism of injury.

- CT Pan Scan Trauma protocol was ordered.

- Locules of gas were identified in the lumbar spinal canal. Remainder of the study was unremarkable with no evidence of traumatic soft tissue injury or fractures.
Pneumorrhachis

- Free air within the spinal canal is a rare phenomenon that can result from trauma anywhere along the spine/calvarium, extension from pneumomediastinum, or spontaneous formation.
- In this case, even in a traumatic setting, there was no paravertebral or intracanalicular hematoma or fractures to suggest a traumatic cause.
- Pneumorrhachis is managed conservatively as these often resolve spontaneously. However in very rare cases build-up of air may cause intraspinal hypertension or even cord compression in which case urgent decompression is required.
Case 3

- 60 year old female. Sudden onset right sided weakness with time of onset 2 hours prior. Stroke team activation.

- CT Head and subsequent CTA Carotids Protocol.

- Few locules of gas were seen in the region of the cavernous sinus on the side of symptoms on CTA which also confirmed that the gas was not within the ICA.

- No other evidence of intraluminal thrombus or ischemia.
Gas within the Cavernous Sinus

- Gas within the venous system is a not uncommon finding on contrast enhanced study and is often due to gas introduced with venous injections.

- The other common cause of gas within the cavernous sinus is in skull base fractures. In the setting of trauma and cavernous sinus gas, care should be taken to identify a fracture.

- In this case, the gas was a red-herring and unrelated to the patient’s symptoms. This finding is similar to other cases of small volume air emboli in that it is of little clinical significance and managed conservatively.