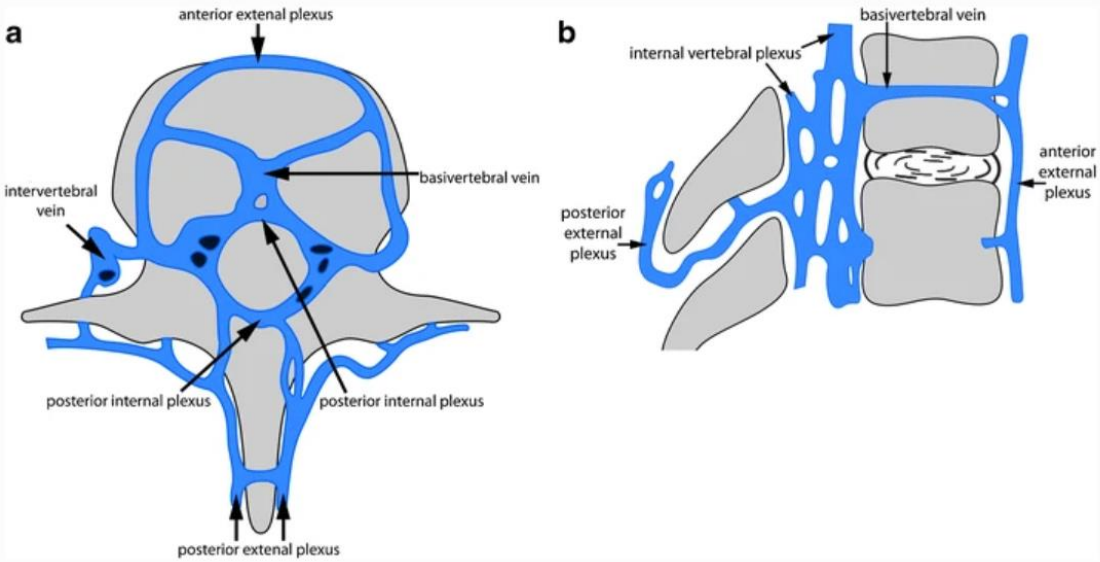
Transient high density vertebral bone lesions

- Contrast enhancement of the vertebral body marrow may be seen secondary to collateral venous blood flow via the vertebral venous plexus in the setting of superior vena cava obstruction.
- Slowly growing, often with nonspecific symptoms
- Chest collateral veins usually occur in superior vena cava obstruction and then develop through four classic pathways: azygos and hemiazygos, internal thoracic and laterothoracic, superficial thoracoabdominal, and vertebral venous plexus (posterior way)
- Less frequently, chest collateral veins can develop secondary to unilateral thrombosis of the brachiocephalic venous trunk, as in our case where the posterior pathway was involved



Axial (**a**) and sagittal (**b**) view showing the vertebral posterior network through the different venous plexi, presenting as a large avalvular system, thus explaining the high-density lesion distribution: basi-vertebral vein bed (posterior corporeal anastomosis of the two plexi) and pediclar regions (lateral pediclar anastomosis though the intervertebral veins)

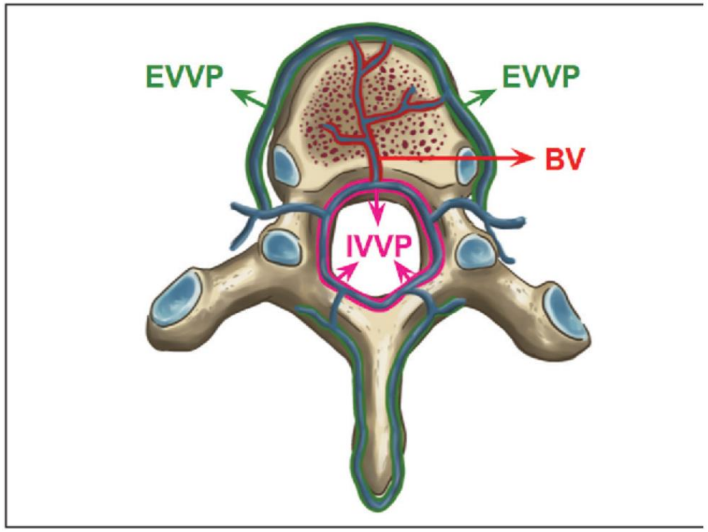


Figure 1. Diagram illustrating the vertebral venous plexus, highlighting

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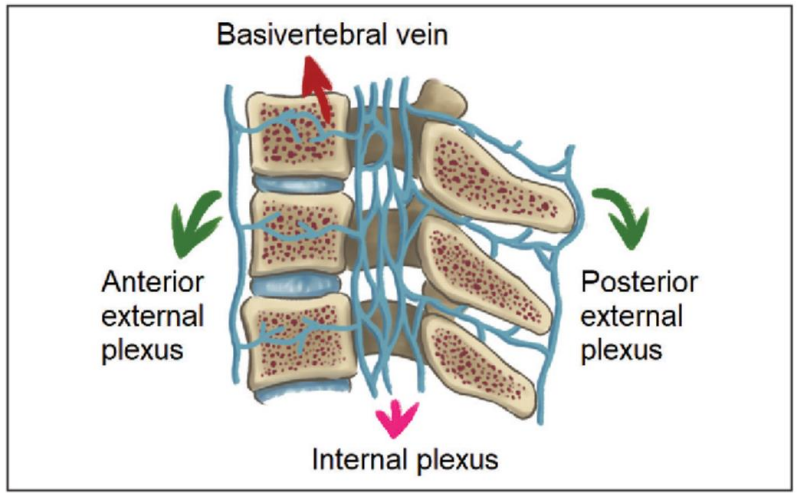

Figure 2. Diagram illustrating the vertebral venous plexus in the sagittal plane.

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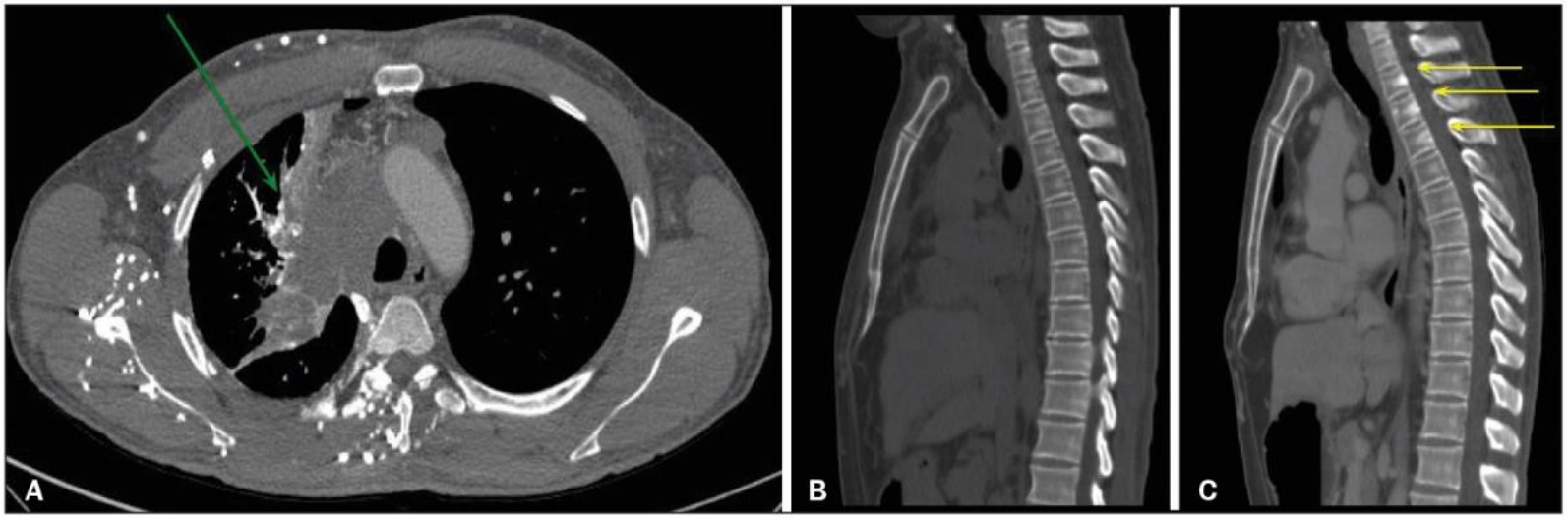
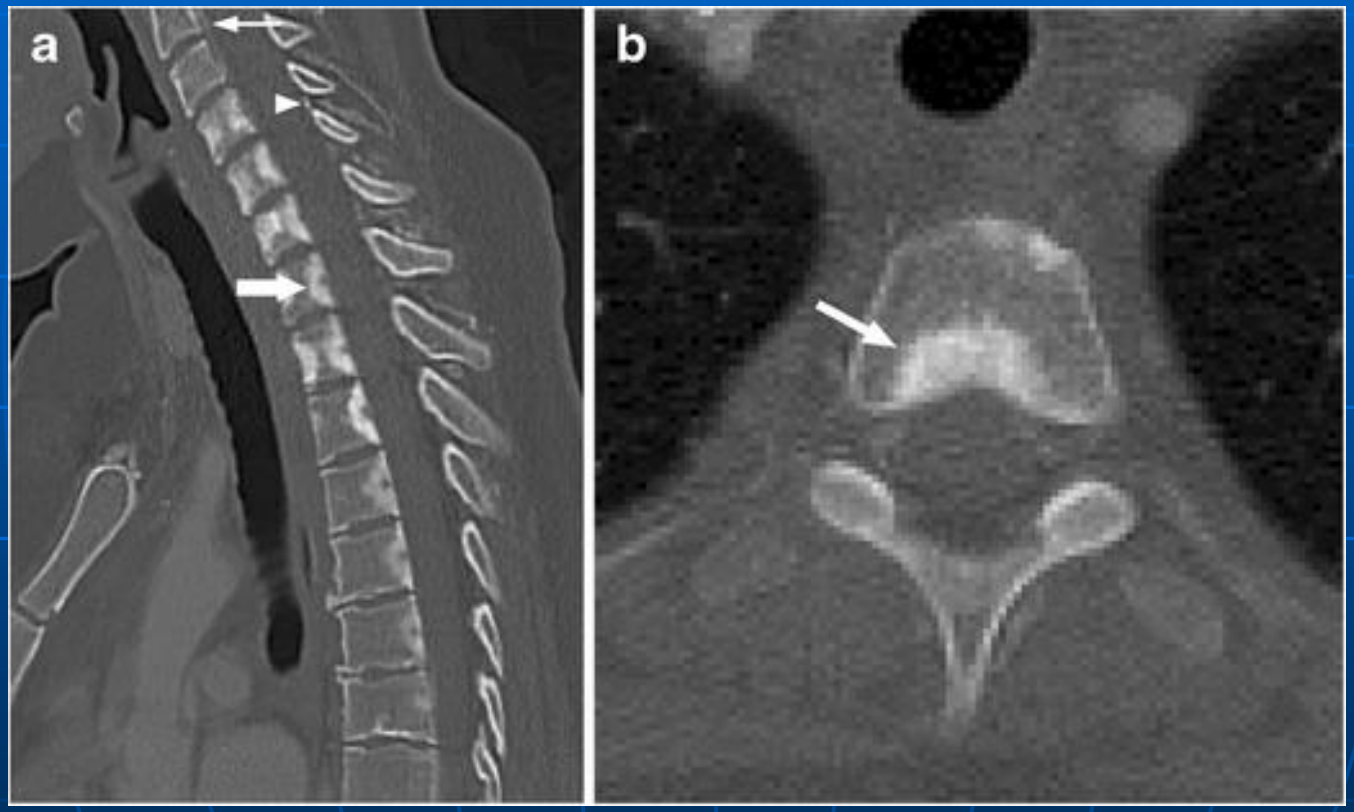
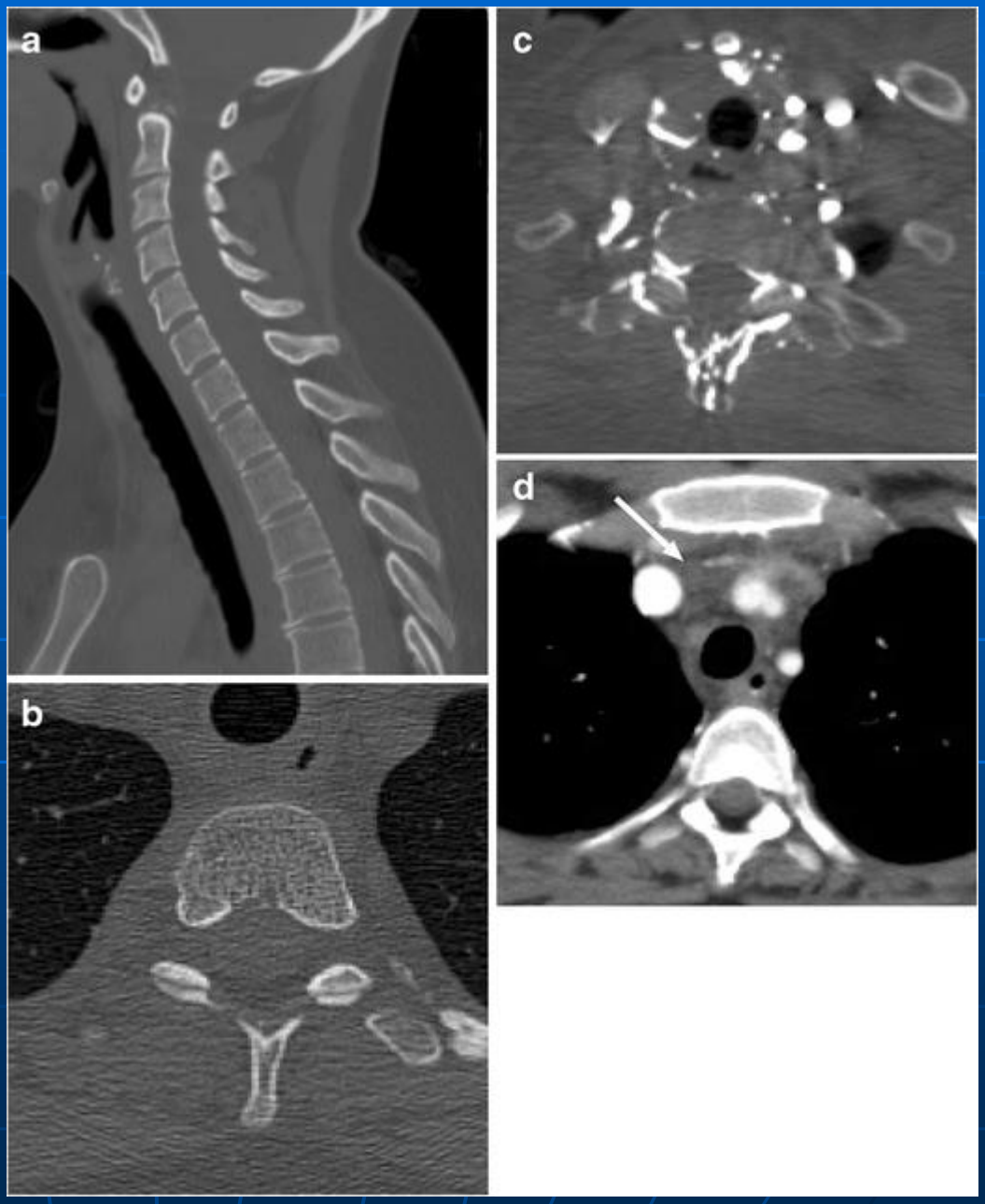


Figure 8. A: Chest CT with intravenous contrast in a 50-year-old male patient diagnosed with small cell carcinoma evolving to superior vena cava thrombosis

Figure 8. A: Chest CT with intravenous contrast in a 50-year-old male patient diagnosed with small cell carcinoma evolving to superior vena cava thrombosis (arrow). B,C: Unenhanced and contrast-enhanced CT images, respectively. The unenhanced image shows preserved vertebral bodies, and the contrast-enhanced image shows enhancement of the upper thoracic vertebral bodies, due to reflux of contrast medium by the vertebral venous plexus (arrows). Collapse


a
b

- Non-contrast CT scan performed 10 days after showing regression of the lack of findings to correspond to those seen on the initial contrast-enhanced exam on the
  - Sagittal view (a)
  - Axial view (b)
- C: Extensive anterior and posterior chest collateral veins.
- D:Left brachiocephalic vein thrombosis (arrow)



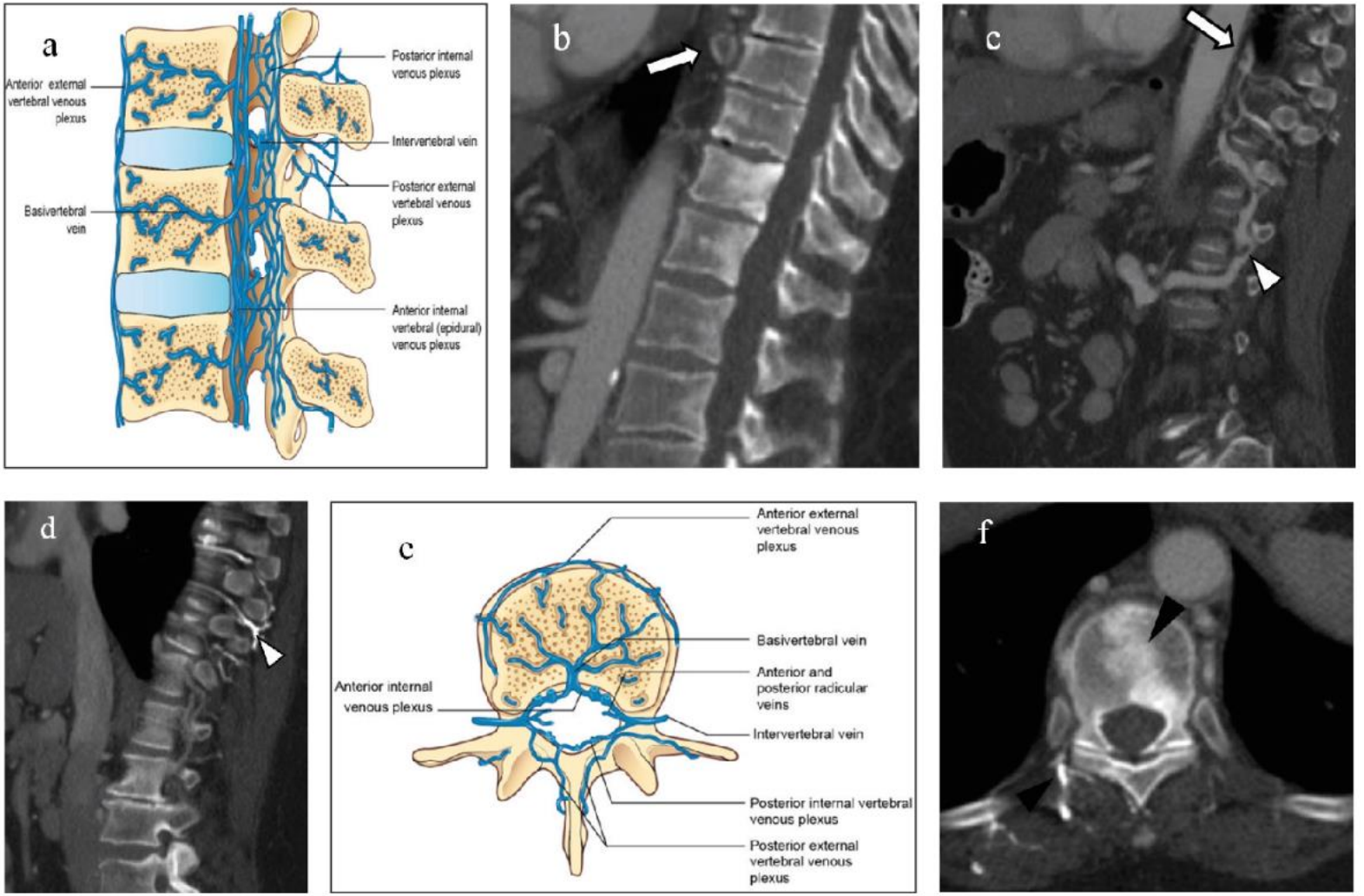


Figure 3. (a–f) Anatomy of the vertebral venous plexus with CT correlation. Sagittal images (a–d) reveal the complexity of the vertebral venous network with numerous internal collaterals bridging the anterior and posterior external venous plexus. These collaterals are usually occult on imaging but can become distended (white arrowhead) by occlusive thrombus (arrow) or venous narrowing upstream. Axial images (e,f) highlight the reflux of contrast through the basivertebral venous system and into the external vertebral venous plexus (black arrowhead). (a,e) As originally depicted by Netter illustration and re-drawn with permission of Elsevier, Inc. All rights reserved. www.netterimages.com Collapse

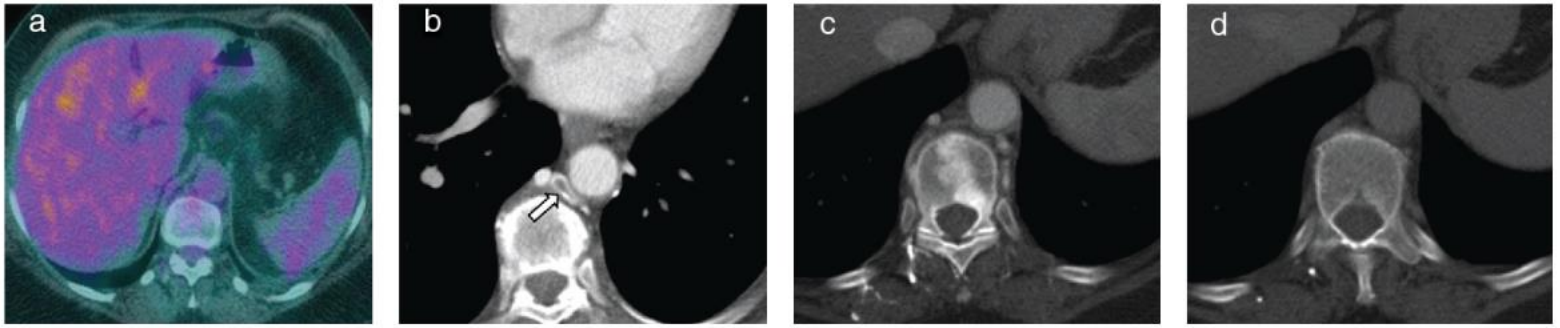


Figure 2. (a–d) Non-contrast positron emission tomography CT centred at the site of previous abnormal vertebral body attenuation demonstrates no 18-fludeoxyglucose-avid metastatic disease with the abnormal attenuation in question no longer apparent (a). Review of the prior contrast-enhanced CT scan in question (b–d) revealed subtle thrombus in the hemiazygos vein (arrow) with much of the abnormal attenuation centred in the basivertebral veins (c). On delayed phase, the abnormal attenuation has resolved (d). Collapse

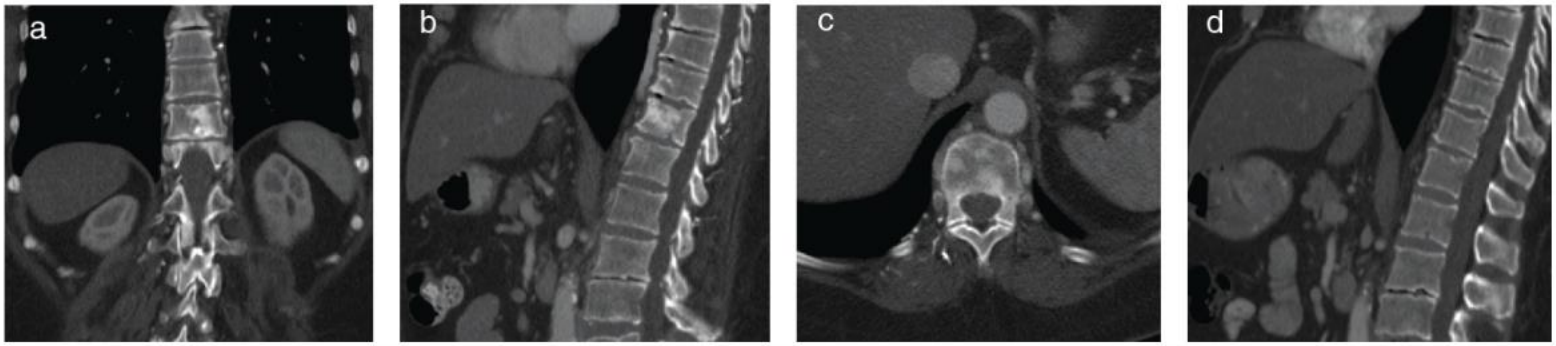


Figure 1. (a–d) A 66-year-old female with a history of lung and breast cancer presents with new onset abdominal pain. Contrastenhanced CT scan of the abdomen and pelvis (a–c) reveals abnormal high attenuation within the lower thoracic vertebrae. Comparison was made with a prior study performed in 2011 (d), which showed no bone abnormality at that time. This was interpreted as new osseousmetastatic disease. Collapse