Aneurysmal Bone Cyst

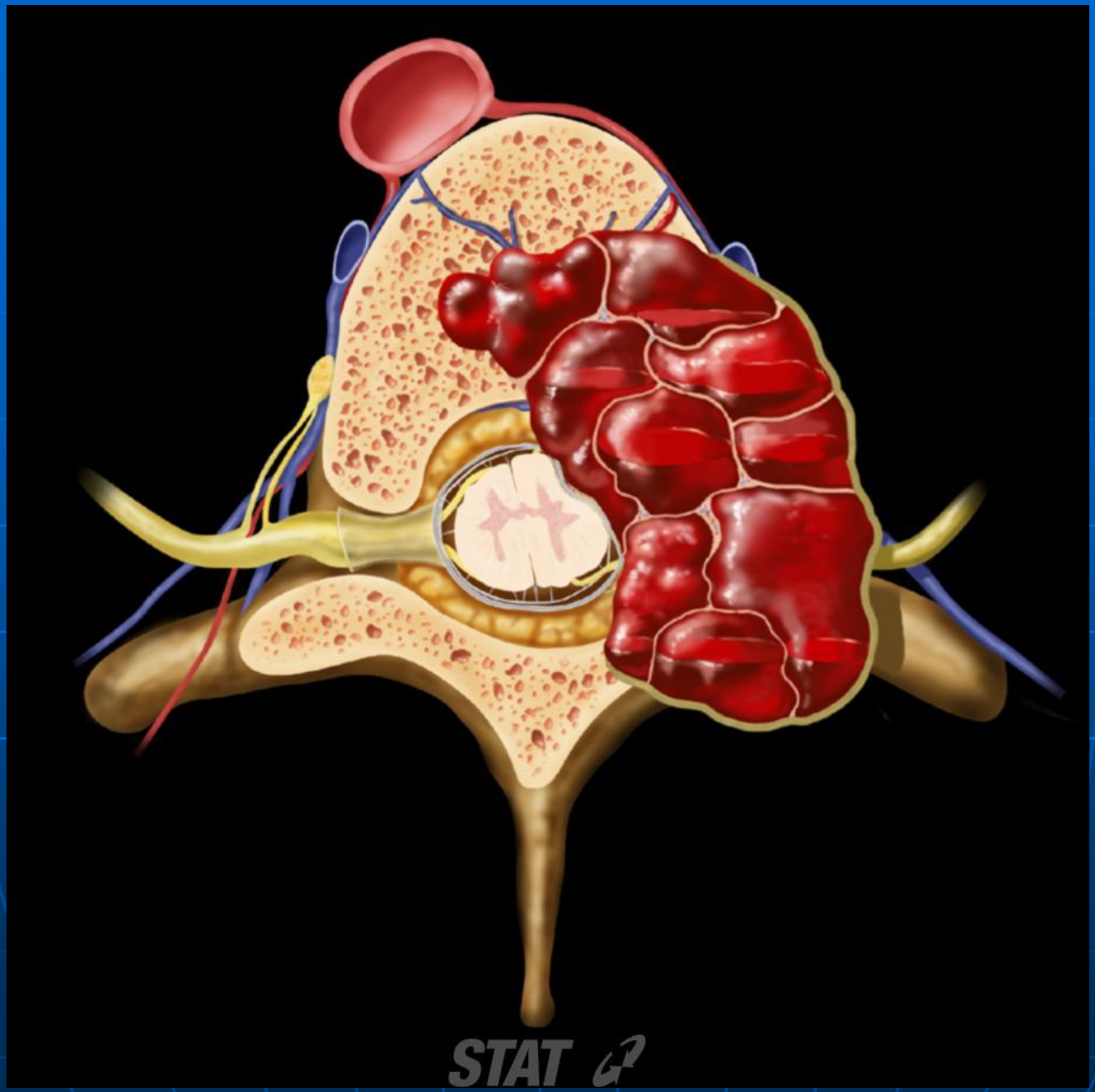
- Benign expansile tumor-like bone lesions of uncertain etiology, composed of numerous blood filled channels, and mostly diagnosed in children and adolescents.
- Now considered true neoplasm since cytogenetic abnormalities found in > 50%

Aneurysmal Bone Cyst

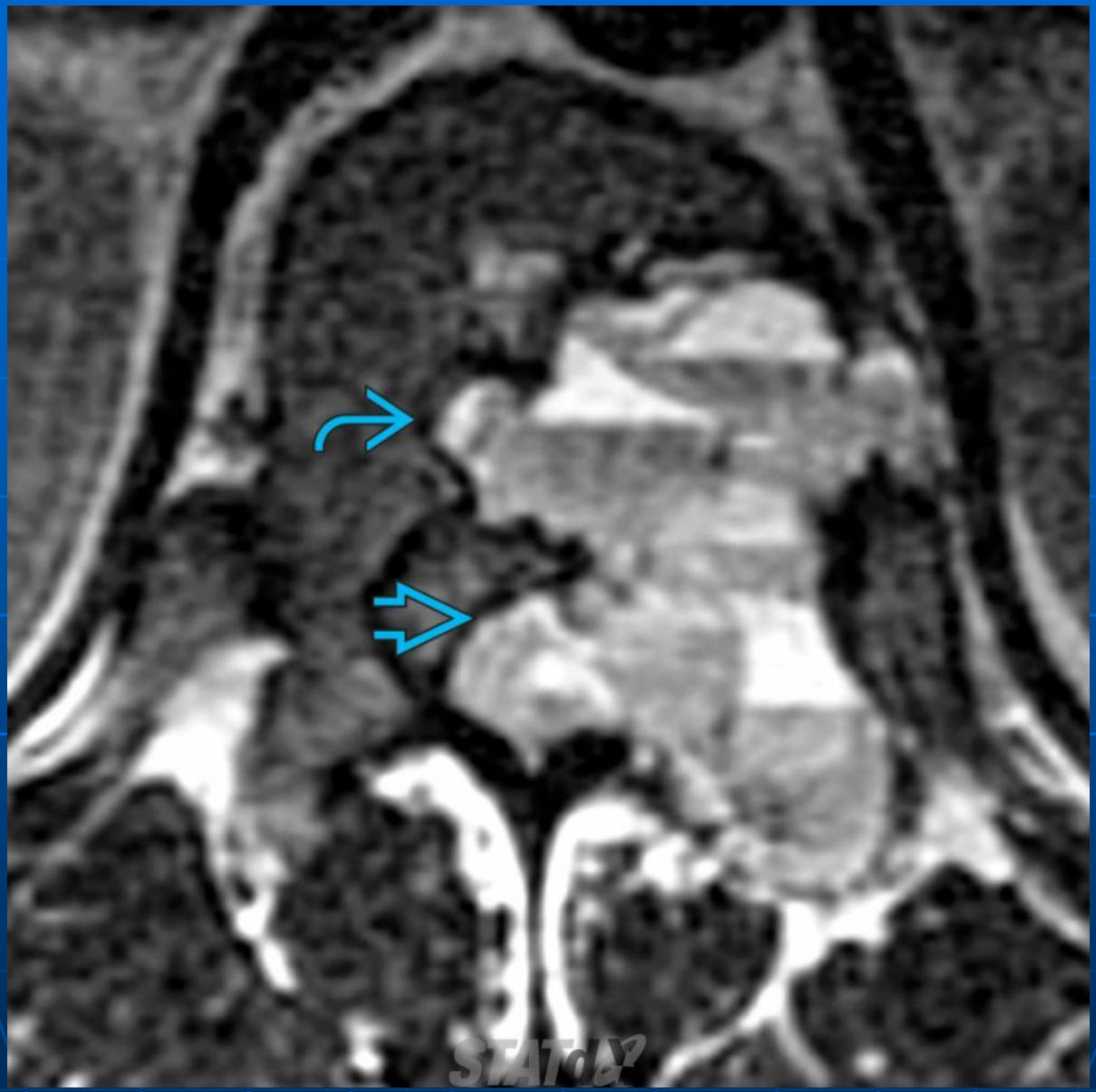
- Demographics
- Age
  - 80% under 20 years old
- Gender
  - Slightly more common in females
- Absent pedicle sign caused by ABC, osteoblastoma, lytic osteogenic sarcoma, metastasis, trauma, congenital absence of pedicle

Imaging

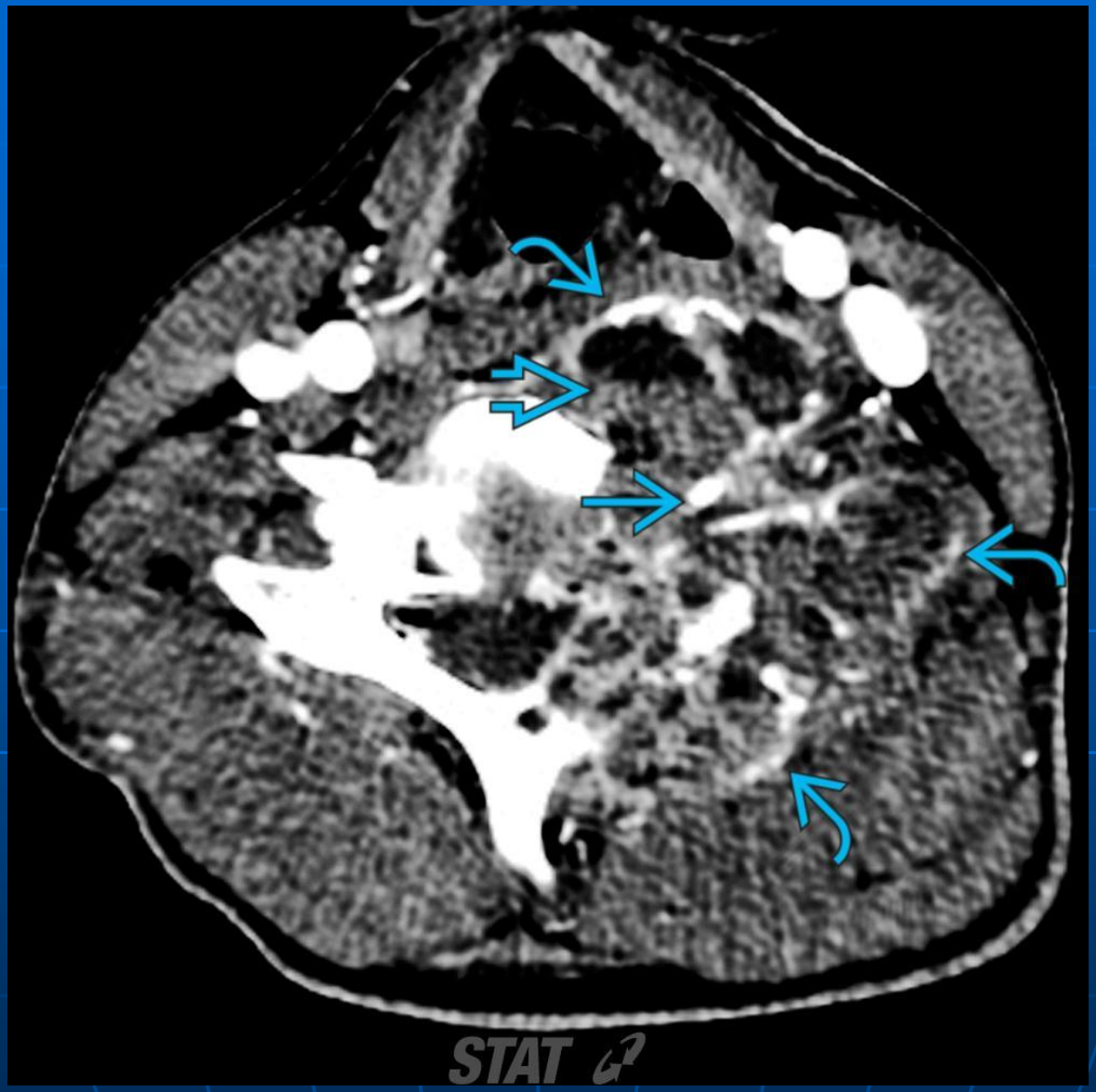
- 10-30% of aneurysmal bone cysts (ABCs) occur in spine and sacrum
- Centered in neural arch, extends into vertebral body
- Balloon-like expansile remodeling of bone
  - Thinned, "eggshell" cortex
  - Focal cortical destruction common
- Absent pedicle sign: Expansion of pedicle results in loss of pedicle contour on AP radiographs
- Contains multiple round cysts with fluid-fluid levels
  - Caused by hemorrhage, blood product sedimentation
- Blood-filled cysts separated by septa of varying thickness
  - Periphery and septa enhance
  - Solid ABC variant enhances diffusely
- Calcified tumor matrix absent
- Narrow, nonsclerotic zone of transition with adjacent bone
- CT best to differentiate from telangiectatic osteogenic sarcoma
  - Narrow zone of transition in ABC
  - Absence of infiltration into surrounding soft tissues
- MR shows epidural extent, cord compromise



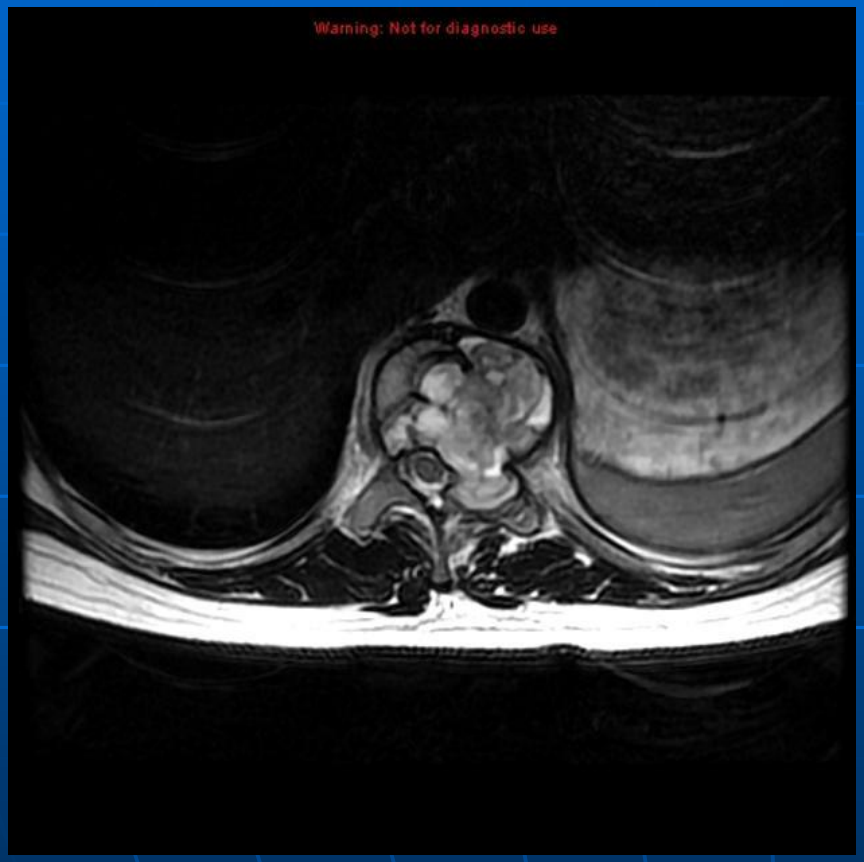
Axial graphic shows aneurysmal bone cyst with an expansile, multicystic mass in the posterior vertebral body and pedicle extending into epidural space. Fluid-fluid levels are characteristic.



Axial T2WI MR shows aneurysmal bone cyst of T12 with multiple fluid-fluid levels due to layering blood products. The zone of transition (cyan curved arrow) to normal bone is narrow and sclerotic. There is cortical breakthrough, as well as extension into the spinal canal (cyan open arrow), compressing the spinal cord.



Axial CECT shows a markedly expansile mass (cyan curved arrow) arising from the C5 articular pillar and containing multiple fluid-fluid levels (cyan open arrow). Contrast enhancement around the periphery of the lesion is difficult to distinguish from reactive bone. Note the displaced but patent vertebral artery (cyan solid arrow).


Warning: Not for diagnostic use

DDx:

- **Osteoblastoma**
  - Same age range
  - Expansile lesion of neural arch
  - Bone matrix visible on plain films or CT
  - May be associated with ABC
- **Telangiectatic Osteogenic Sarcoma (OGS)**
  - Same age range or older
  - Involves vertebral body &/or neural arch
  - Also shows fluid-fluid levels
  - Has more permeative bone destruction
  - Wider zone of transition
  - Infiltrates into surrounding soft tissues
- **Metastases**
  - Older patients
  - Involves vertebral body ± neural arch
  - Destructive lesion with associated soft tissue mass
  - Rare: Vascular metastasis can have fluid-fluid levels
  - Usually destroys bone cortex rather than expanding it
  - Renal cell carcinoma can have "soap bubble" expansile appearance
- **Giant Cell Tumor (GCT)**
  - Slightly older patients
  - Originates in vertebral body rather than neural arch
  - Expansile lytic lesion ± soft tissue mass
  - May be associated with ABC
- **Plasmacytoma**
  - Older patients, usually over 40 years old
  - Involves vertebral body, usually spares neural arch
  - May expand vertebral body
- **Tarlov Cyst**
  - Perineural cyst occurring in sacrum
  - Arises in neural foramina or spinal canal
  - Causes bone remodeling
  - No enhancement
  - Simple fluid on all pulse sequences
- **Simple Bone Cyst (SBC)**
  - In peripheral bones, SBC is another cystic lesion
  - May have fluid-fluid levels
  - Not seen in spine