Osteoblastoma

- Benign tumor that forms osteoid
- Differentiated grossly from osteoid osteoma by larger size (> 1.5 cm)
- Tumor prostaglandins release causes extensive peritumoral edema.
- May be occult on radiographs; consider MR in young patients with painful scoliosis
- Dull, localized pain

Osteoblastoma

- Age
  - 90% in 2nd-3rd decades of life
  - Have been diagnosed in patients up to 7th decade of life
- Gender
  - M:F = 2-2.5:1
- Natural History & Prognosis
  - Grow slowly
  - 10-15% recurrence for typical OB
  - 50% recurrence for aggressive OB
- Treatment
  - Curettage with bone graft or methylmethacrylate placement
  - Preoperative embolization may be useful

Location

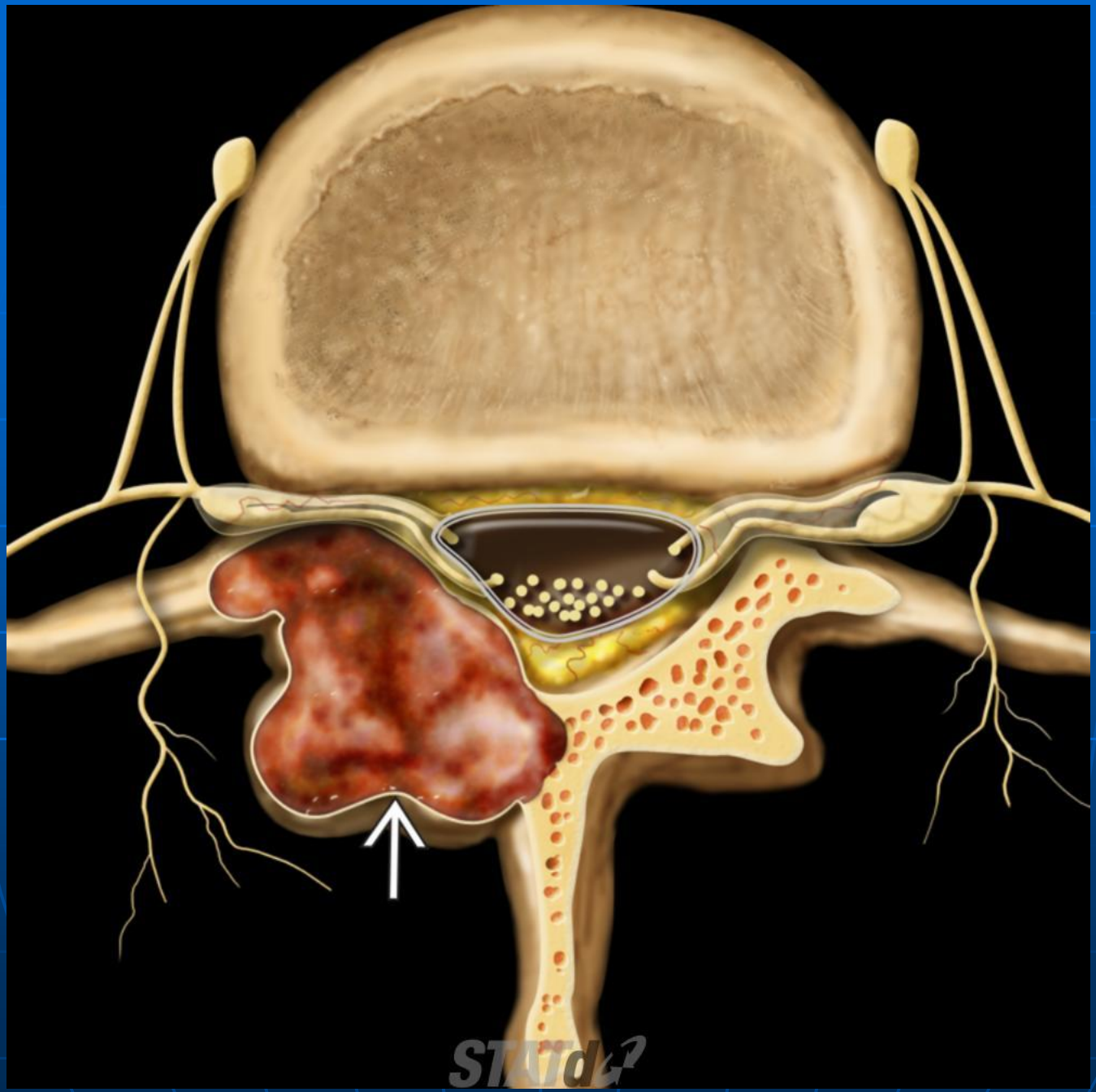
- Sacrum (60%); predominantly in lower sacral elements
- Sphenooccipital/nasal (25%)
  - 33% are of chondroid chordoma variety
- Cervical spine (10%)
- Thoracolumbar spine (5%)
- Usually midline in origin

Imaging

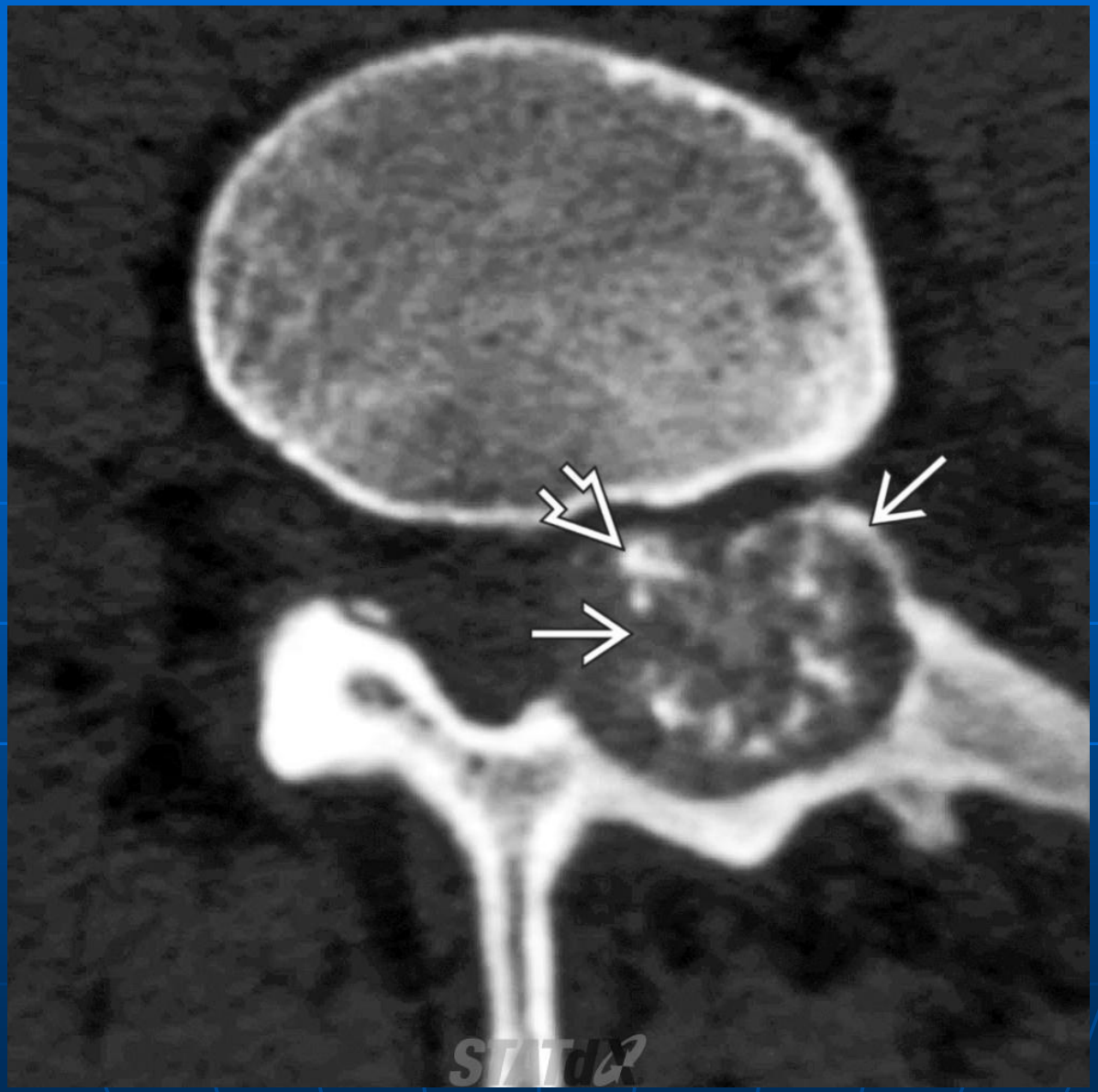
- 40% of osteoblastomas (OB) occur in spine
- Well-circumscribed, expansile lesion of neural arch
  - Frequent extension into vertebral body
  - Narrow zone of transition, sclerotic rim
- Periosteal inflammatory response of adjacent ribs, pleural thickening, effusion
- Peritumoral edema (flare phenomenon)
  - Edema enhances, obscures tumor margins, mimics malignancy (MR)

DDx:

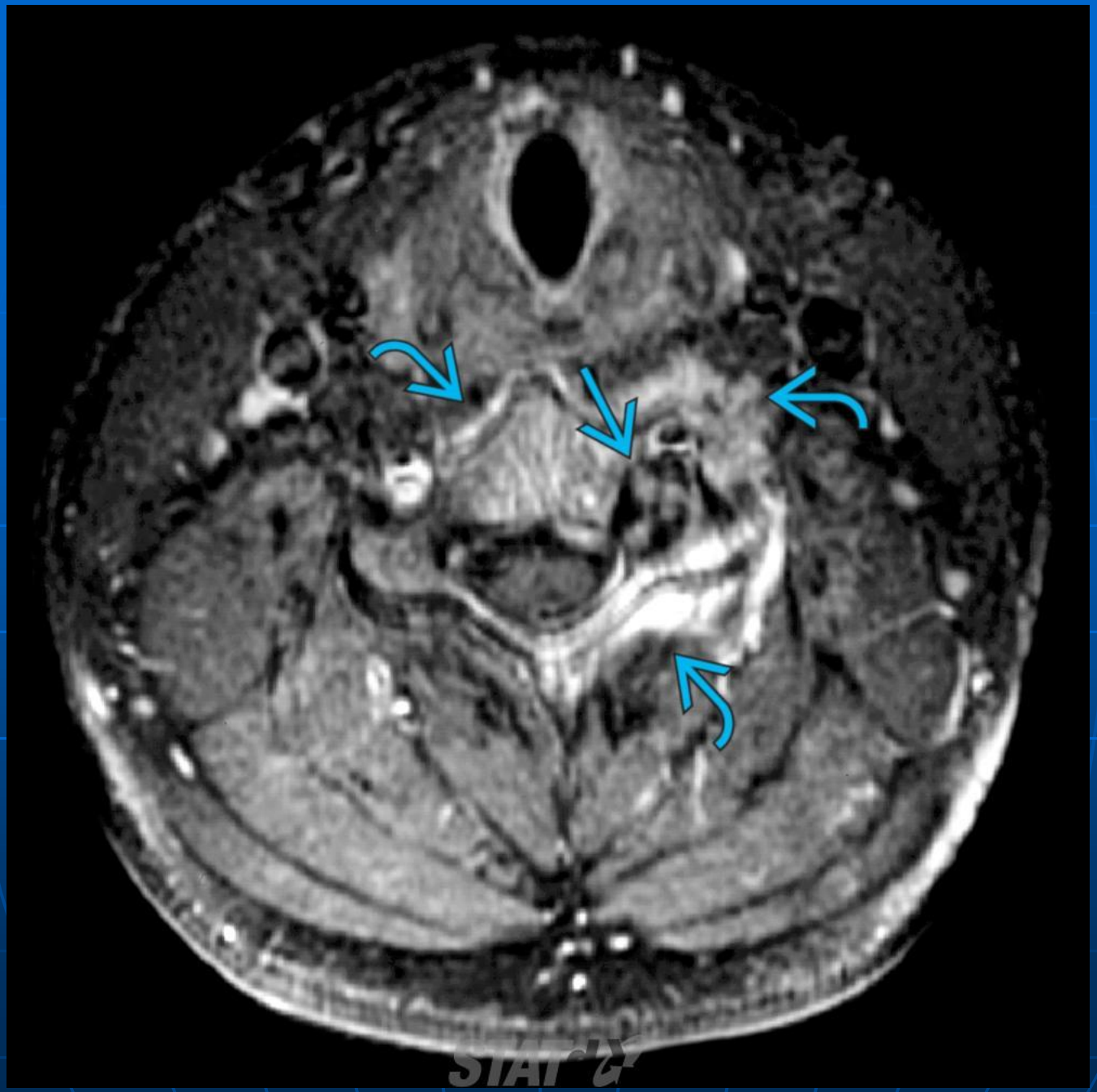
- **Osteoid Osteoma (OO)**
  - Smaller (< 1.5 cm)
  - Round nidus with surrounding sclerotic bone
  - Same age group
  - Pain is usually more intense
  - Scoliosis is common
- **Aneurysmal Bone Cyst (ABC)**
  - Expansile lesion of posterior elements
  - ABC component present in 10-15% of OB
  - ABC may also be isolated or associated with other tumors
  - Multiple blood-filled cavities with fluid-fluid levels
  - Matrix absent in ABC without OB
- **Metastasis**
  - Older patients
  - Usually destroys cortex rather than expanding
  - May be expansile, especially in renal cell carcinoma
  - Involves posterior elements &/or vertebral body
- **Osteogenic Sarcoma (OGS)**
  - Sarcoma containing bone matrix
  - Rare in spine
  - More aggressive appearance on radiographs, CT
  - Wider zone of transition
  - Cortical breakthrough rather than cortical expansion
  - Involves neural arch &/or vertebral body
- **Chordoma**
  - Involves vertebral body rather than posterior elements
  - Common in sacrum, rare in vertebrae
  - No matrix; purely lytic tumor
- **Infection**
  - MR appearance of OB may mimic infection because of inflammatory change in adjacent bones
  - Distinction between OB and infection easily made on CT
- **Fibrous Dysplasia**
  - Rare in spine
  - Expansile lesion of posterior elements
  - May be lytic or contain ground-glass matrix or tiny trabeculae of bone
- **Chondrosarcoma**
  - Rare in spine
  - Involves vertebral body &/or posterior elements
  - May have fairly unaggressive features on imaging studies
  - Cartilage calcification in arcs and rings



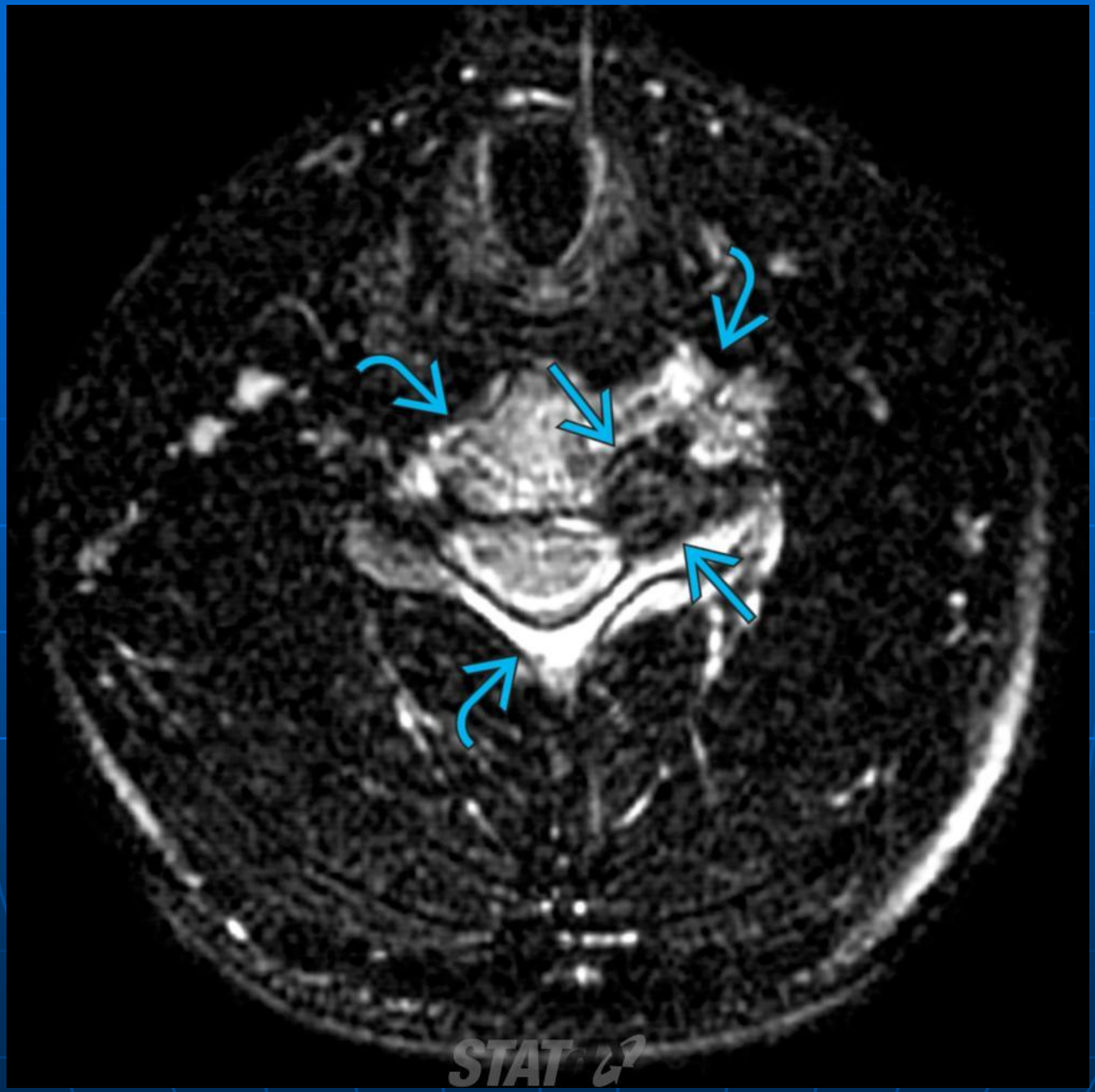
Axial graphic shows expansile, highly vascular osteoblastoma (OB) (white solid arrow) arising in the right lamina and impinging on the exiting nerve root.



Axial bone CT in the same patient shows an expansile mass (white solid arrow) containing thin, irregular bone trabeculae (white open arrow) characteristic of OB. Although cortical breakthrough is present, the zone of transition to adjacent bone is narrow and sclerotic.



Axial T1WI C+ FS MR in the same patient shows enhancement of nonossified portions of tumor (cyan solid arrow) as well as the peritumoral edema (cyan curved arrow).



Axial T2WI FS MR shows that the central, densely ossified tumor (cyan solid arrow) remains low signal intensity, while the surrounding edema (cyan curved arrow) is high signal intensity.