Case of the Day
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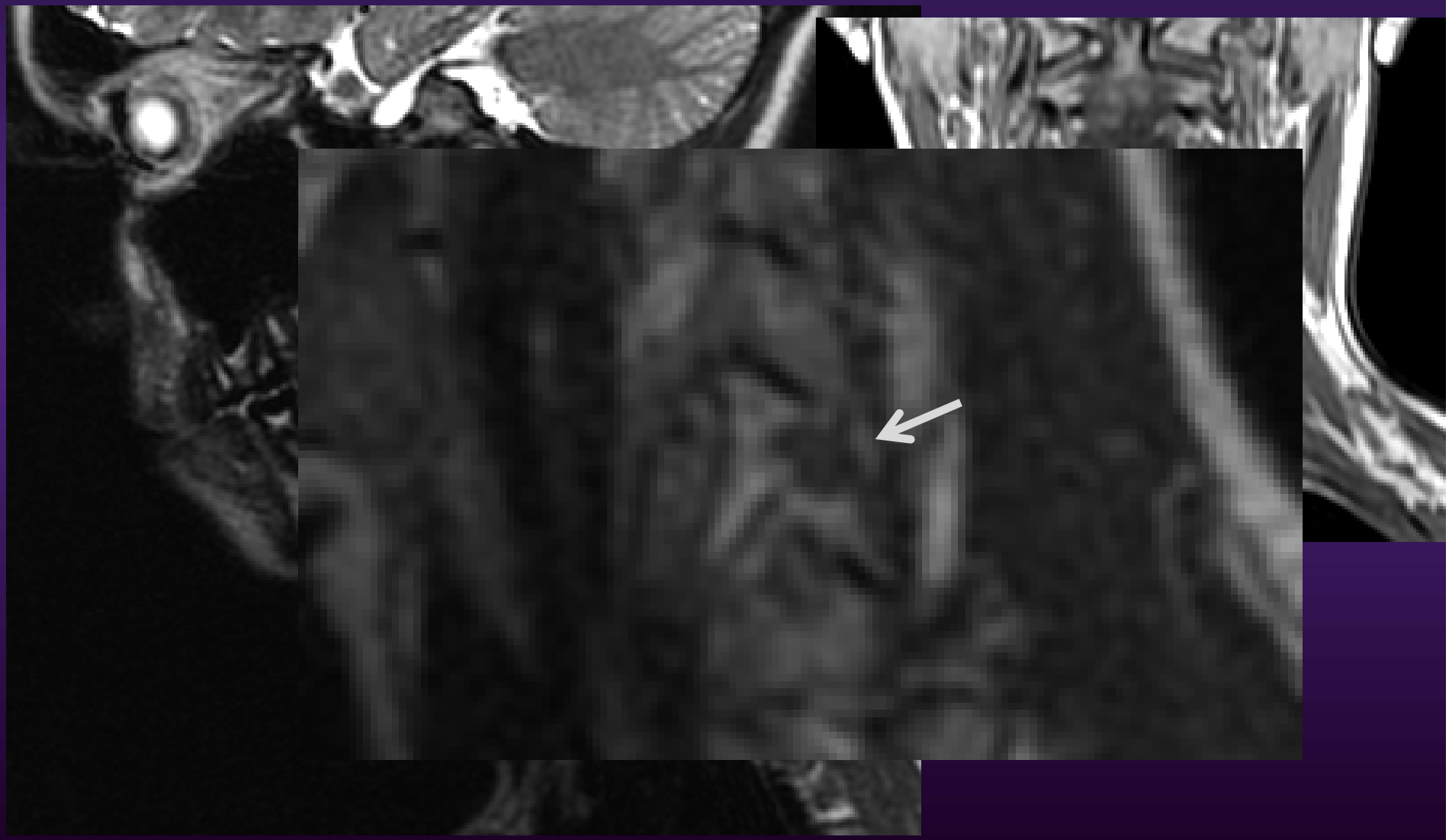
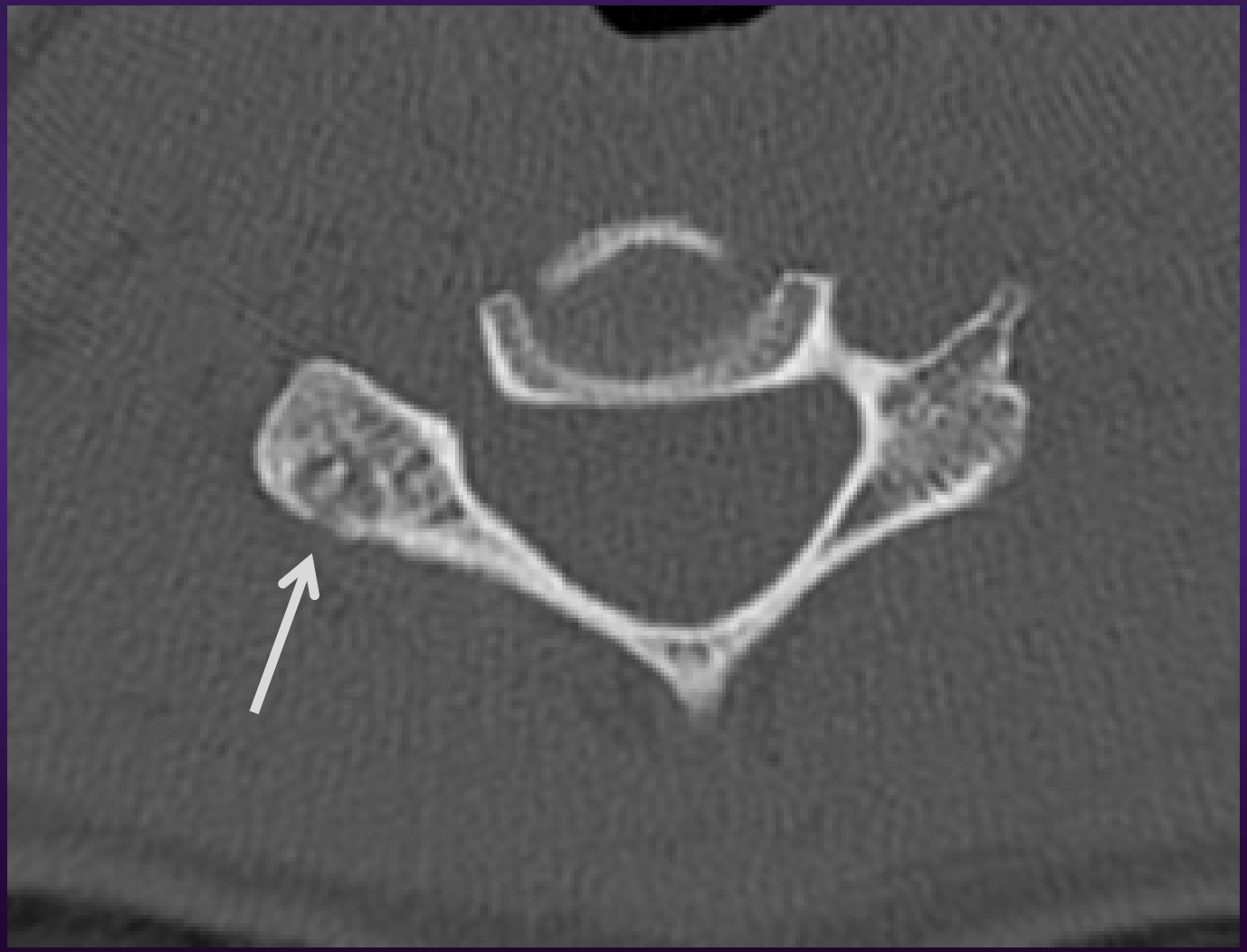
History

- Active 17 year old high school cheerleader with 3 year history of right neck pain that radiated down the dorsal right arm to 3rd digit.
- Unable to sleep on right side, occasionally awoken with pain.
- No history of neck trauma
- Followed by pediatric neurologist
- An MRI was performed

MRI C-Spine

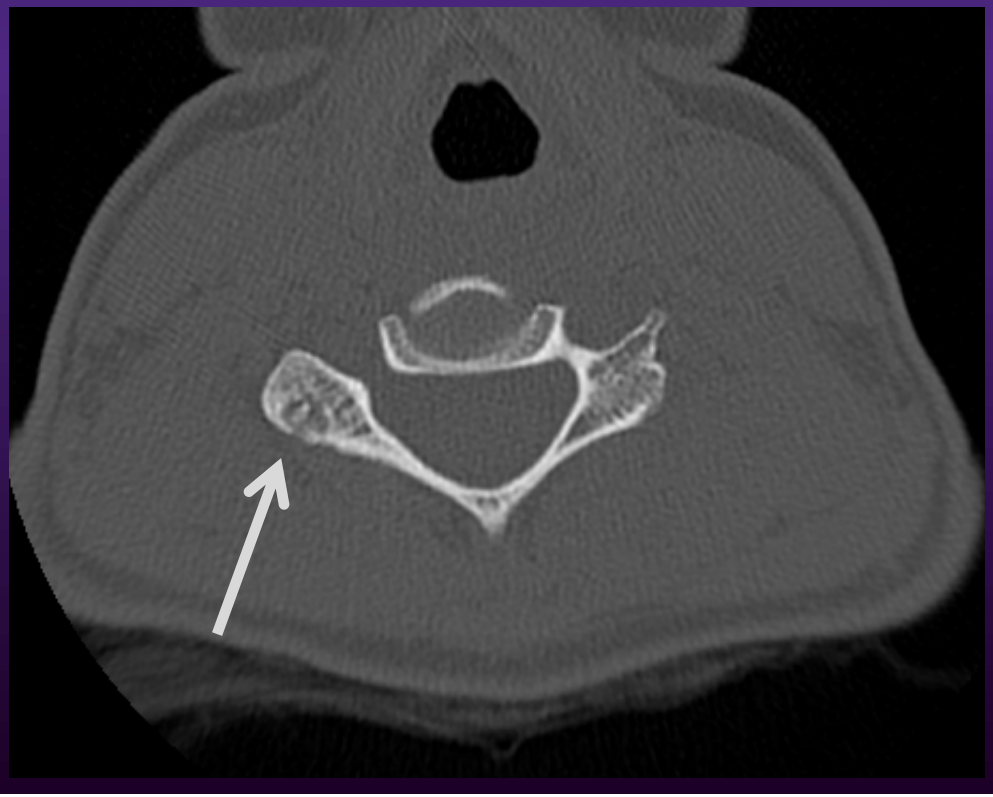


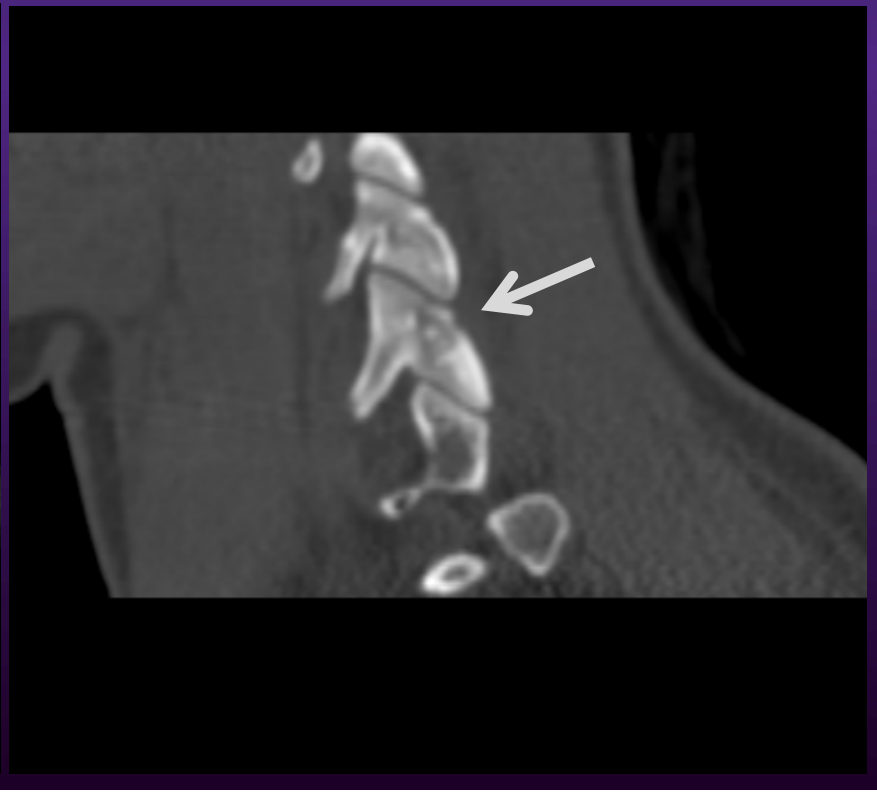
CT C-Spine



CT C-Spine

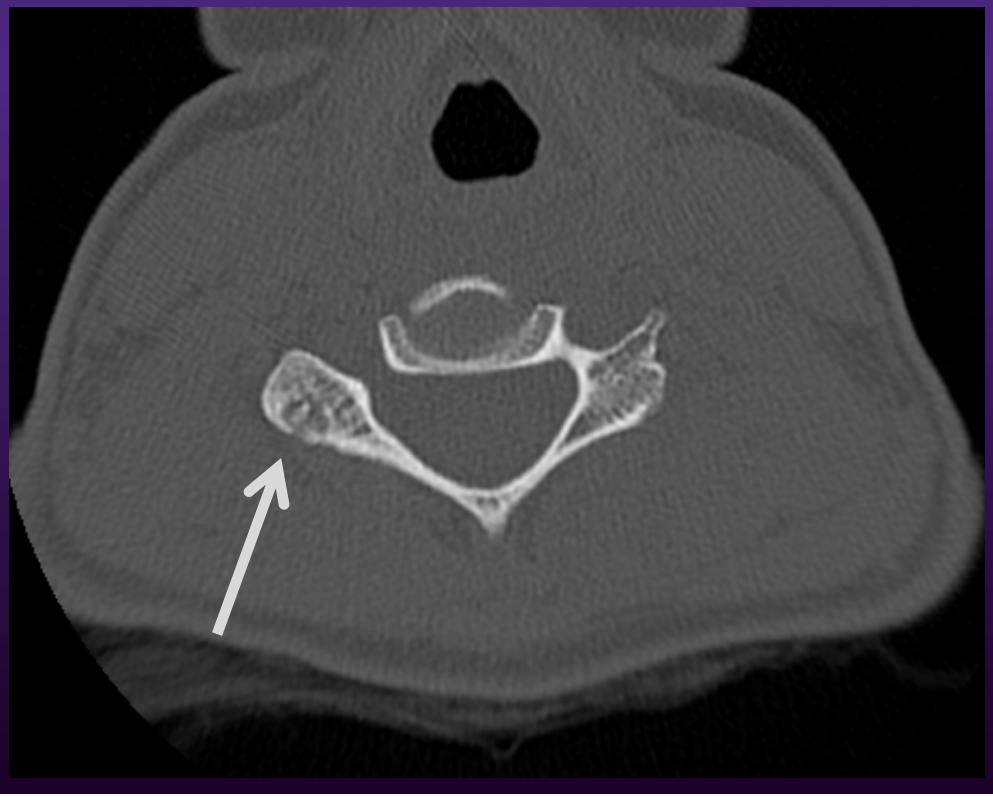
- C6 pars interarticularis: 6mm well-circumscribed lesion with lucent central nidus → Osteoid Osteoma

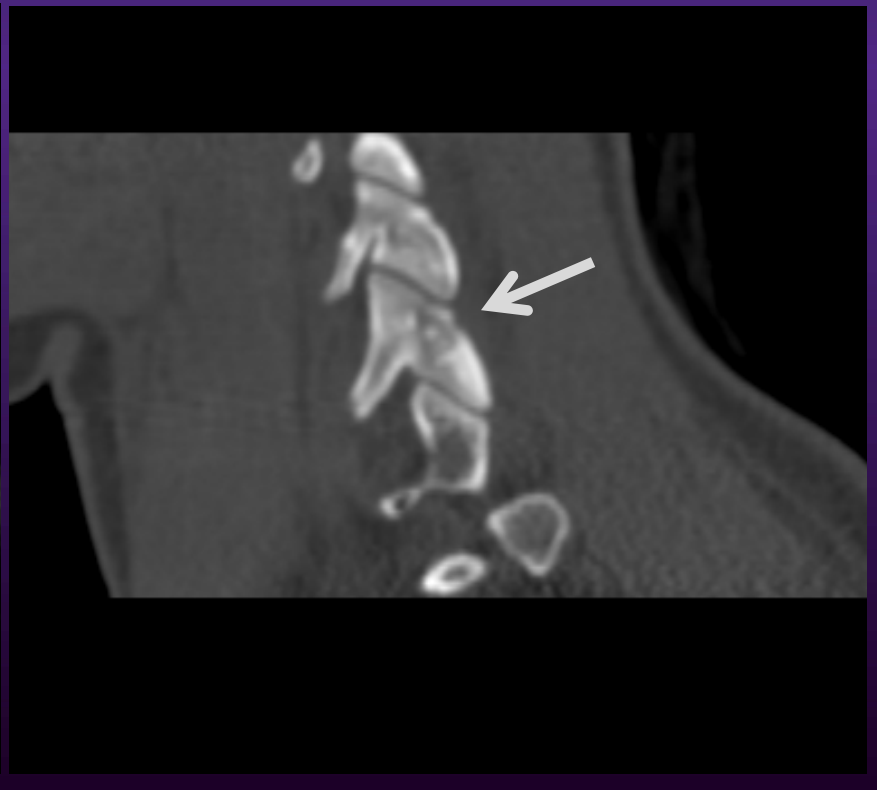




Case: 17 year Female

- Referred to Interventional Radiology
- Lesion in superior articular surface with cortex separation from nerve root – amenable to RFA



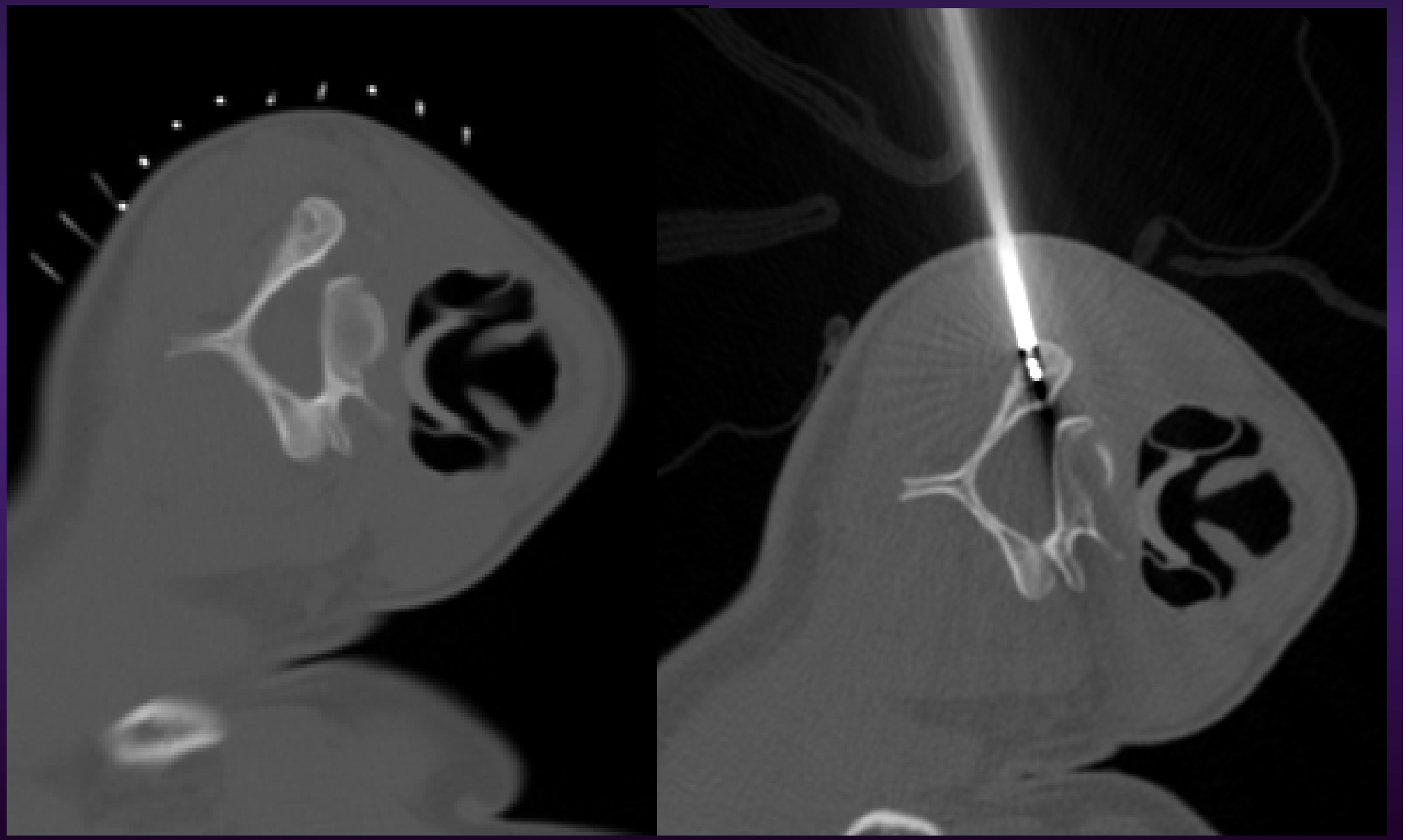


Case: 17 year old Female

CT-Guided RF Ablation

- Performed under general anesthesia
- 11 gauge Vidacare bone biopsy coaxial needle inserted to edge of lesions
- Bone biopsy performed prior to ablation
- RF Ablation performed using 17-gauge probe with 7 mm active tip (Boston Sci. - Soloist):
  - Two 6 minute ablations at 85^{o}
- No complications

CT-Guided RF Ablation



Follow-up

- 6 mo F/U:
  - Complete resolution of neck and right arm pain
  - No longer requiring analgesics

Osteoid Osteoma

- Benign bone tumour (10% of all benign tumours)
- Typically in adolescents – majority between 10-35 yo
- Male predilection (2-4 : 1)
- **Distribution:**
  - Long bones of limbs – 65-80%
  - Phalanges – 20%
  - Vertebrae – 10%
    - Lumbar (59%)
    - Cervical (27%)
    - Thoracic (12%)
    - Sacrum (2%)

Clinical Presentation

- Classical Symptoms:
  - Nocturnal pain that is relieved with salicylates/NSAIDs
- May be tender at the site of tumour (60%)
- Typically “painful scoliosis” when in spine
  - Osteoid osteoma on the concave side
  - Felt to be due to chronic unilateral muscle spasm
- Radicular pain is reported for peri-foraminal spinal lesions

Treatment Options

- Conservative – ASA/NSAIDs
  - Some studies suggest that symptoms will resolve in 1.5-8 years, however, natural history is unclear.
- Surgery
- Percutaneous Radiofrequency Ablation
  - Long term outcomes for RFA equivalent to surgery for osteomas of the extremities

RFA Outcomes – Extremities

- Short-term pain relief (within 2 weeks) - nearly 100% of patients.
- Permanent resolution - 66%–96%
- Symptom recurrence
  - Most likely due to incomplete ablation of the nidus
  - Typically occurs within 6 months of treatment, although can recurrence up to 2 years
  - Re-treatment has a similar success rate as initial Tx

Spinal Radiofrequency Ablation

- Limited small cases series
  - Laus et al[1]: 12 cases (9 surgical, 3 RFA)
    - RFA: 1/3 incomplete (33%), Sx: 1/9 incomplete (11%)
    - No complications
  - Hadjipavlou et al[2]: 7 cases (4 RFA, 3 surgical)
    - RFA: 1/4 recurred (25%), Sx: 1/3 recurred (33%)
    - No complications
  - Rehnitz et al[3]: RFA 6 spinal cases (of 71 total)
    - 100% response (6/6). No recurrence
    - No complications

[1] Laus M et al, Eur Spine J. 2007 Dec; 16(12):2078-82
[2] Hadjipavlou AG et al, Eur Spine J. 2009 Mar; 18(3):345-51.
[3] Rehnitz C et al, Eur J Radiology. 2012 Nov; 81(11):3426-3434

Spinal Considerations

1) Risk of nerve or spinal cord damage

- Proposed techniques to minimize complications
  - Selection: Intact cortical bone between lesion & nerve[2] (e.g. Superior articular processes, outer lamina, spinous process, etc)
  - Monitor: Procedure under Local anesthesia or conscious sedation[1,2]
  - Insulate: Infuse epidural or perineural gas[3]

2) Diagnostic Mimics – Brodie's Abscess, Osteoblastoma

[1] Laus M et al, Eur Spine J. 2007 Dec; 16(12):2078-82
[2] Hadjipavlou AG et al, Eur Spine J. 2009 Mar; 18(3):345-51.
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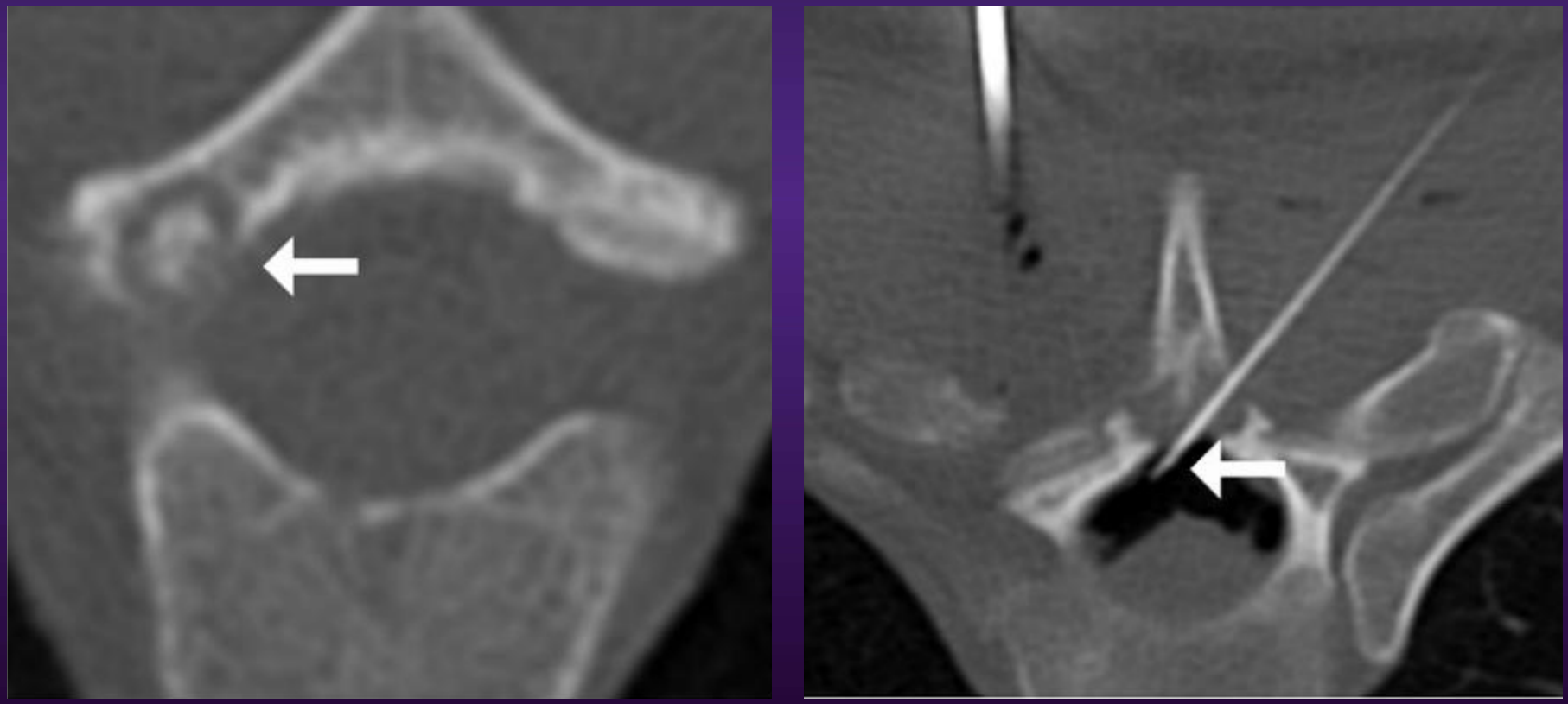
Nerve protection - Insulation

- No cortical separation from the spinal canal



Images from: Rehnitz C et al, Eur J Radiology. 2012 Nov; 81(11):3426-3434

Summary

- Osteoid osteomas of the spine:
  - Less common location (~27% of osteoid osteomas)
  - Commonly present with atypical neck or back pain
  - **Should be considered:** For all adolescent patients with atypical neck/radicular pain or painful scoliosis
- RFA is a safe and effective Tx option for spinal osteoid osteomas:
  - Proper patient selection and approach is important to minimize risk of neurological injury
  - Outcomes are similar to surgery, though data is limited

References

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