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Navigated Osteosynthesis for Unstable Atlas Fractures

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AANOS

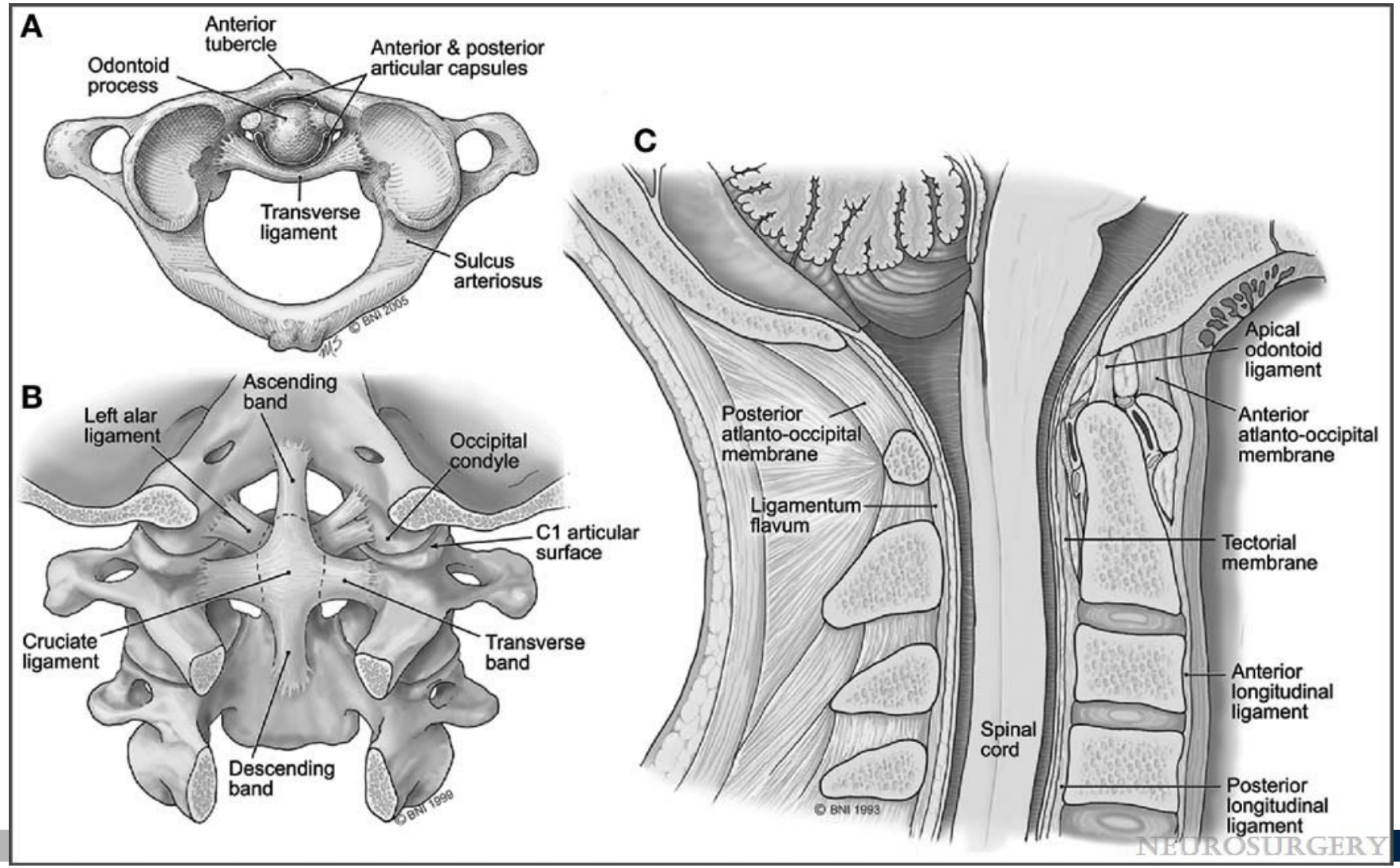
American Academy of Neurological and Orthopaedic Surgeons

47th Annual Scientific Meeting

April 26th, 2024

No financial conflicts to disclose.

Atlas Anatomy



Kakarla, Udaya K.; Chang, Steve W.; Theodore, Nicholas; Sonntag, Volker K. H. Neurosurgery66(3):A60-A67, March 2010.

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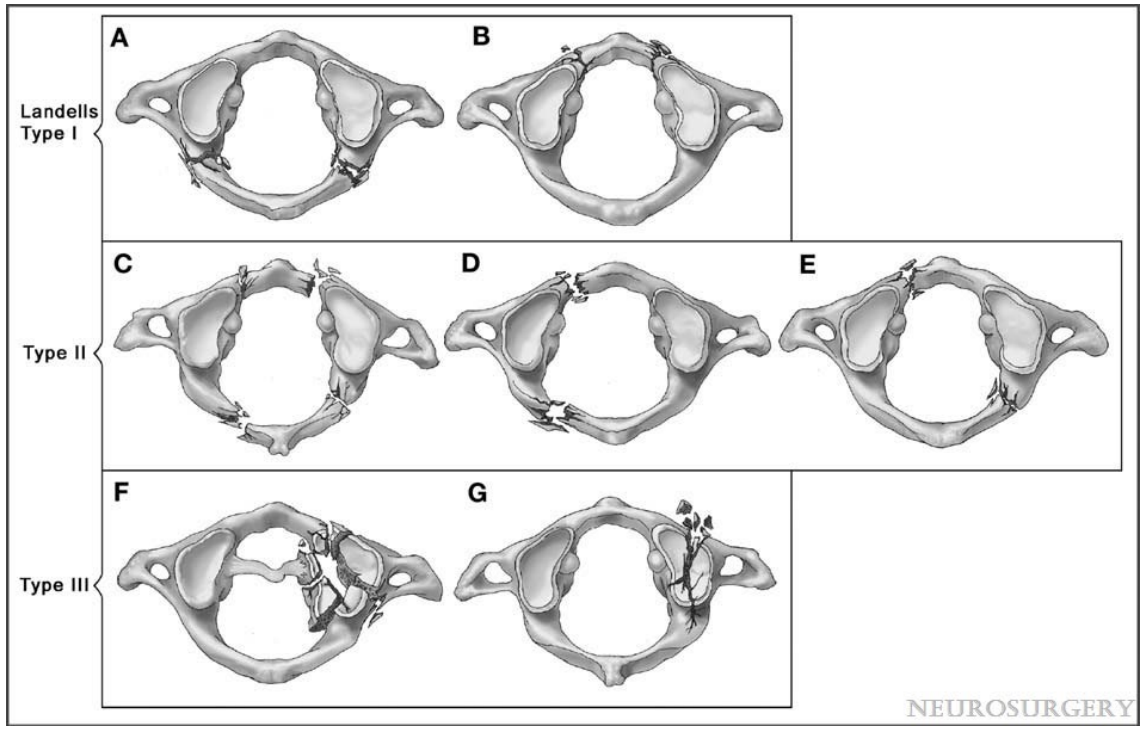
Atlas Fractures

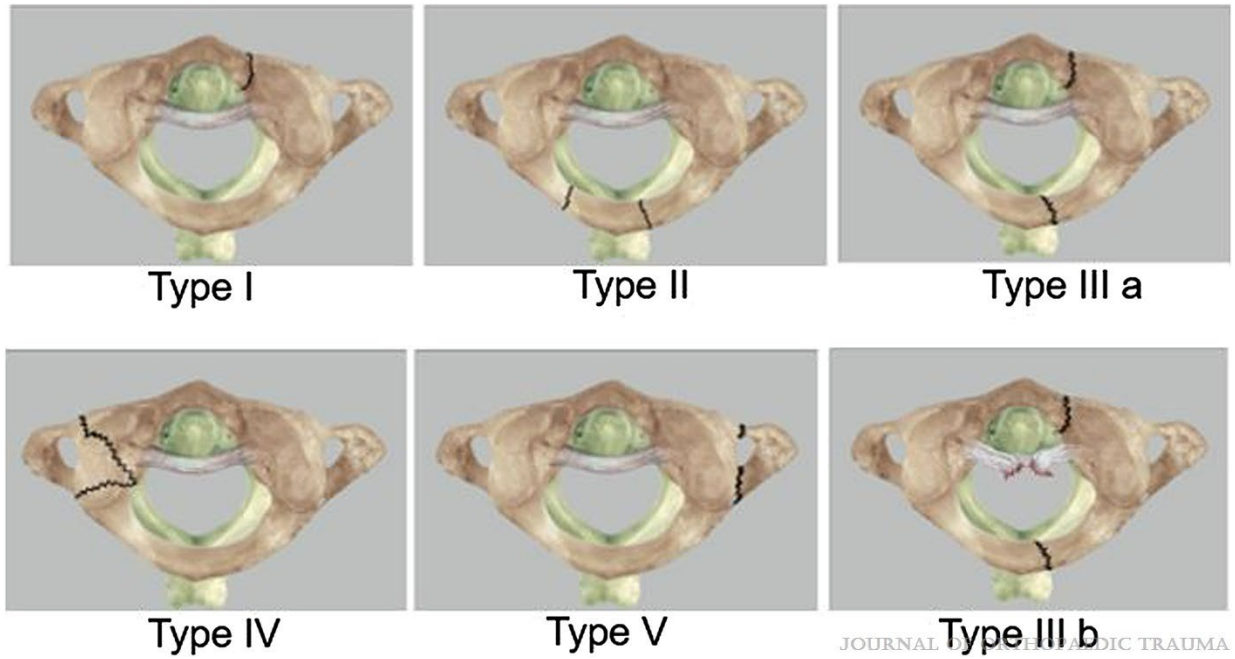
Fracture Classification

Landells and Van Peteghem



Kakarla, Udaya K.; Chang, Steve W.; Theodore, Nicholas; Sonntag, Volker K. H. Neurosurgery66(3):A60-A67, March 2010.

Gehweiler

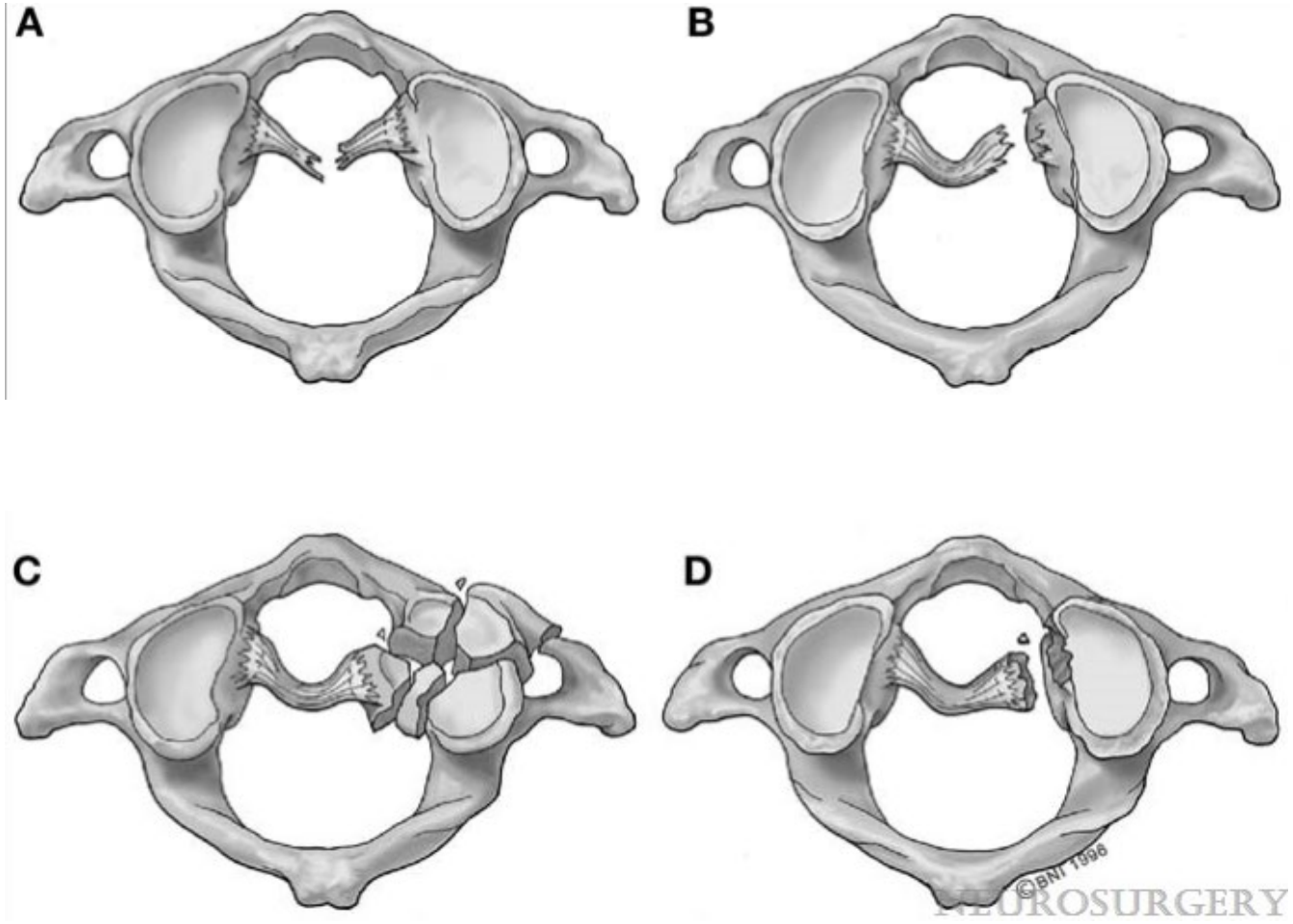


Kandziora, Frank; Chapman, Jens R.; Vaccaro, Alexander R.; Schroeder, Gregory D.; Scholz, Matti. Journal of Orthopaedic Trauma31:S81-S89, September 2017.

Dickman Classification of Transverse Ligament Injury

Type I

Type II



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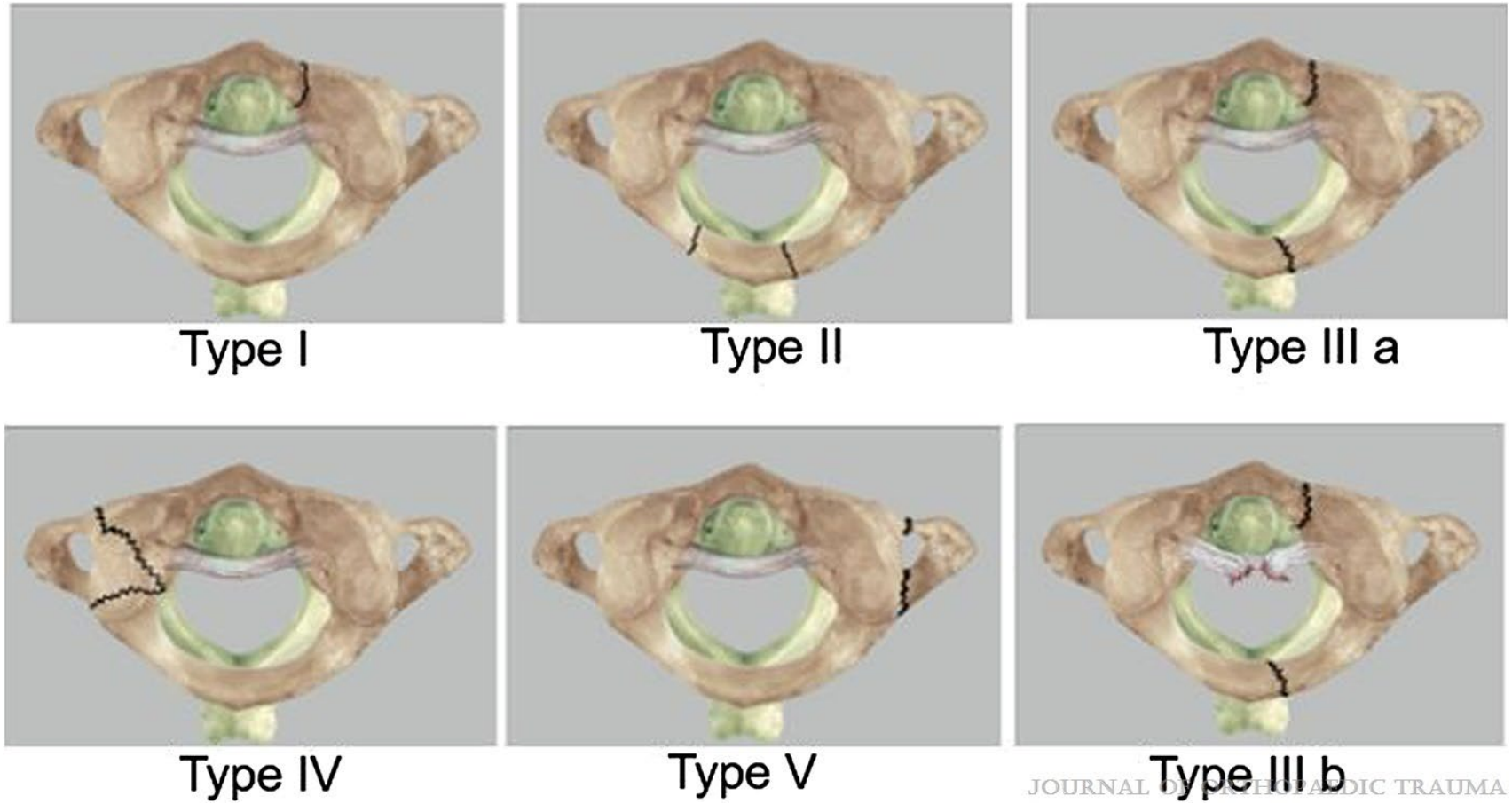
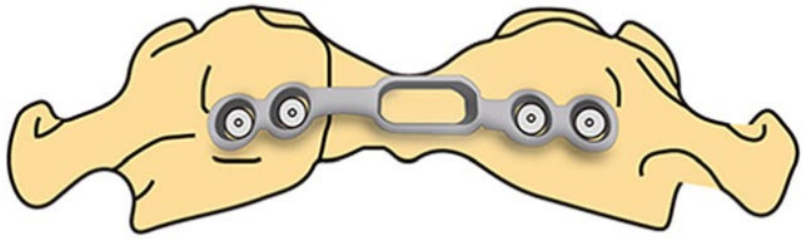
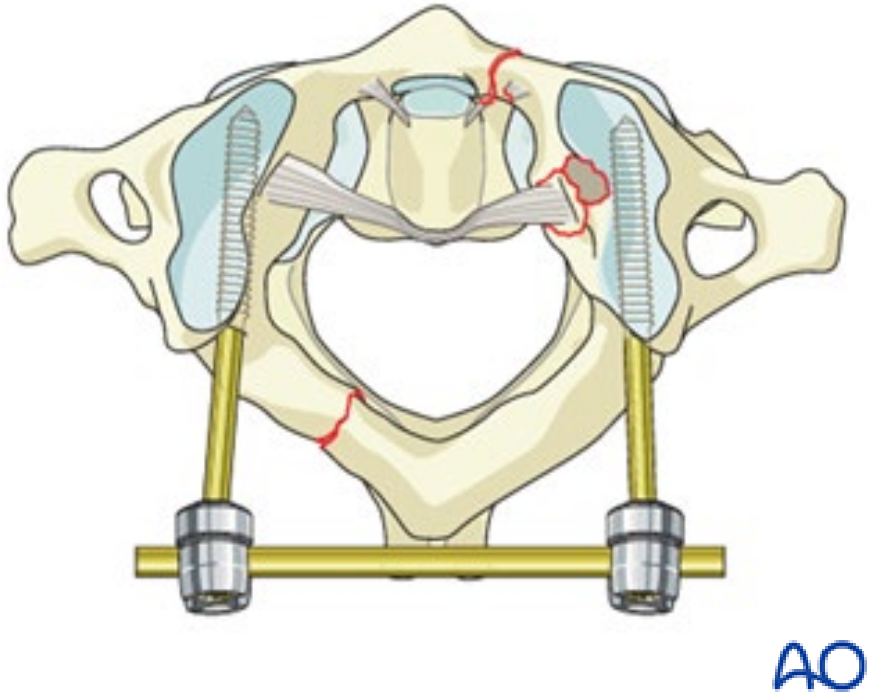
Treatment Approach for Atlas Fractures



Atlas Osteosynthesis





Motion-Preserving Alternative to C1-C2 fusion

Navigated Osteosynthesis for Unstable Atlas Fractures

Single Level I Trauma Center

Case series (n=8)

- 5 Male, 3 Female
- Mean Age 51.3

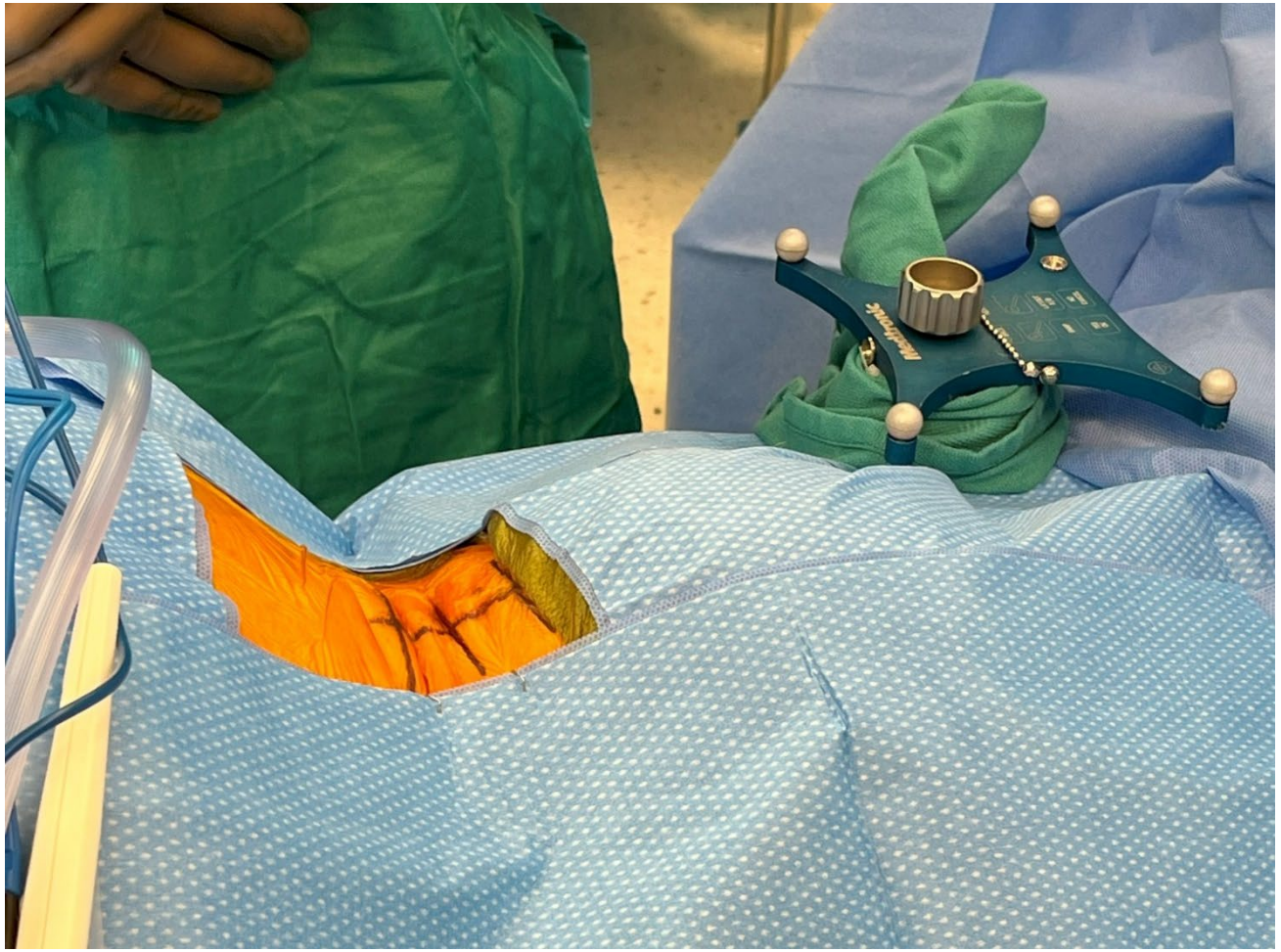
Gehweiler Classification

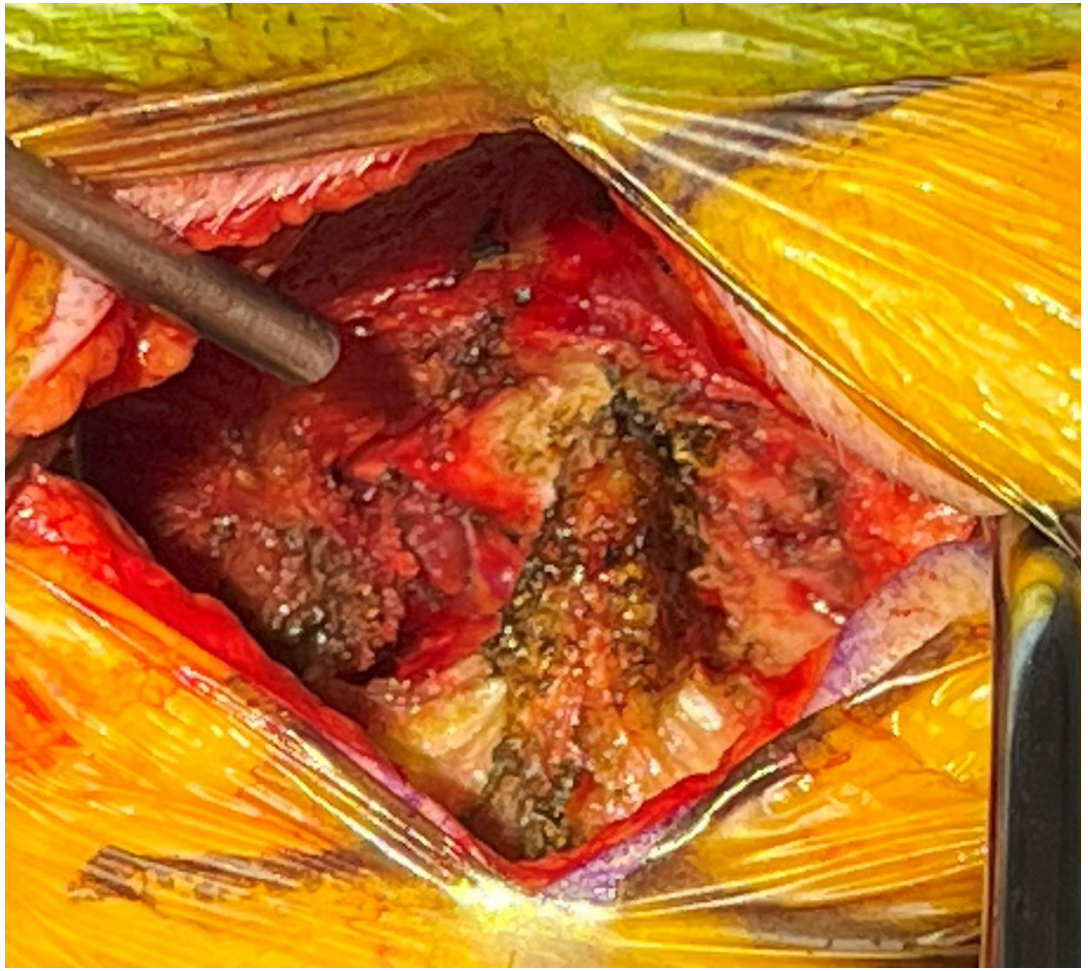
- Type IIIb (n=7)
- Type IV (n=1)

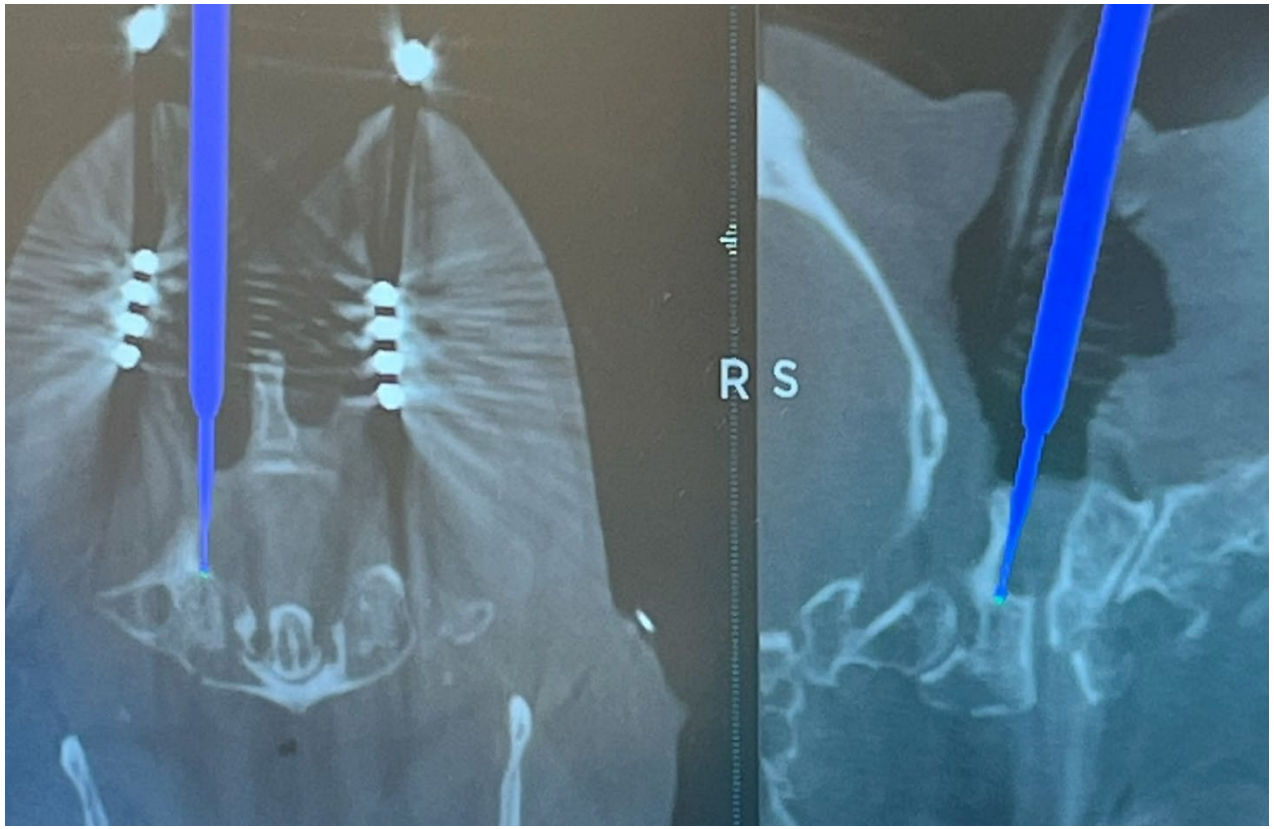
Dickman Classification

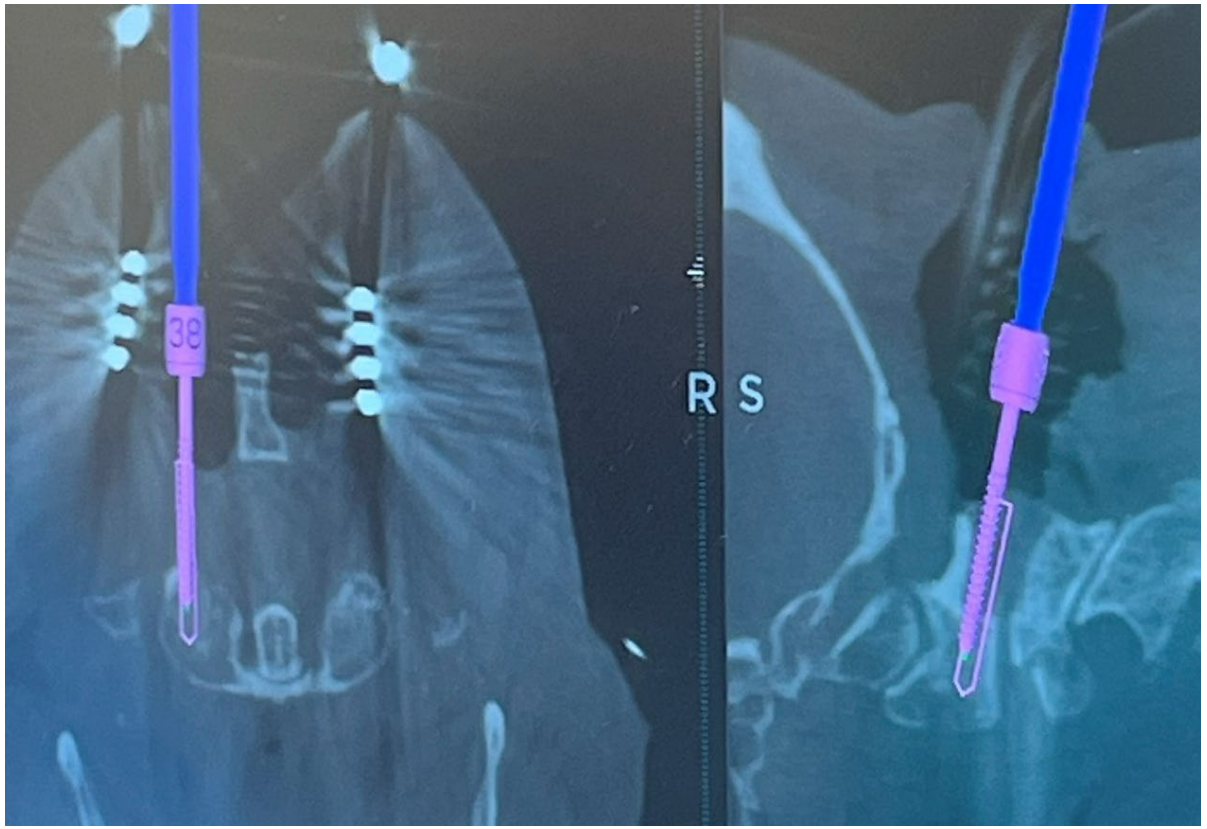
- Type I (n=1)
- Type II (n=6)
- Mixed Type I and Type II (n=1)

Navigation to facilitate C1 lateral mass screw placement in setting of traumatically distorted anatomy









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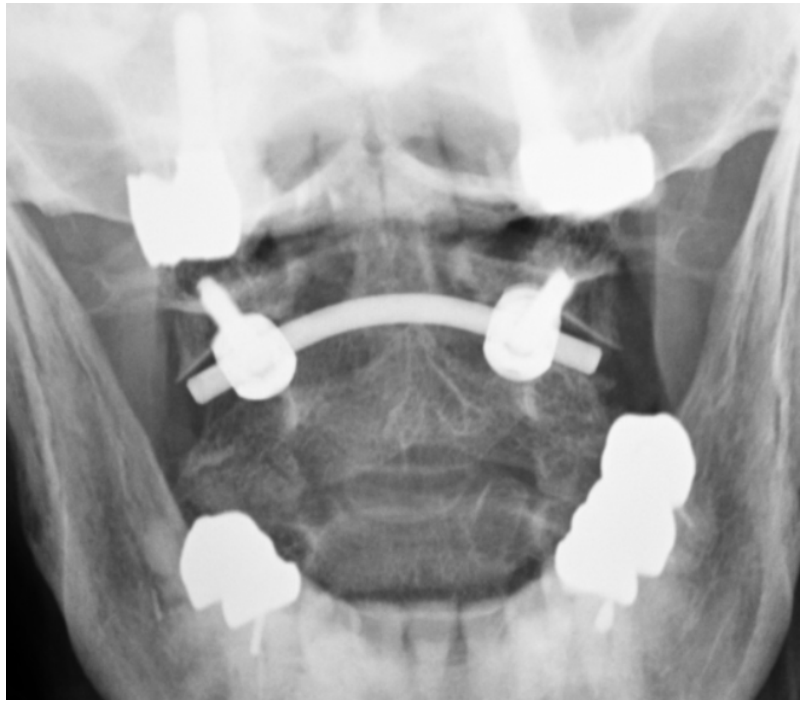
Outcomes

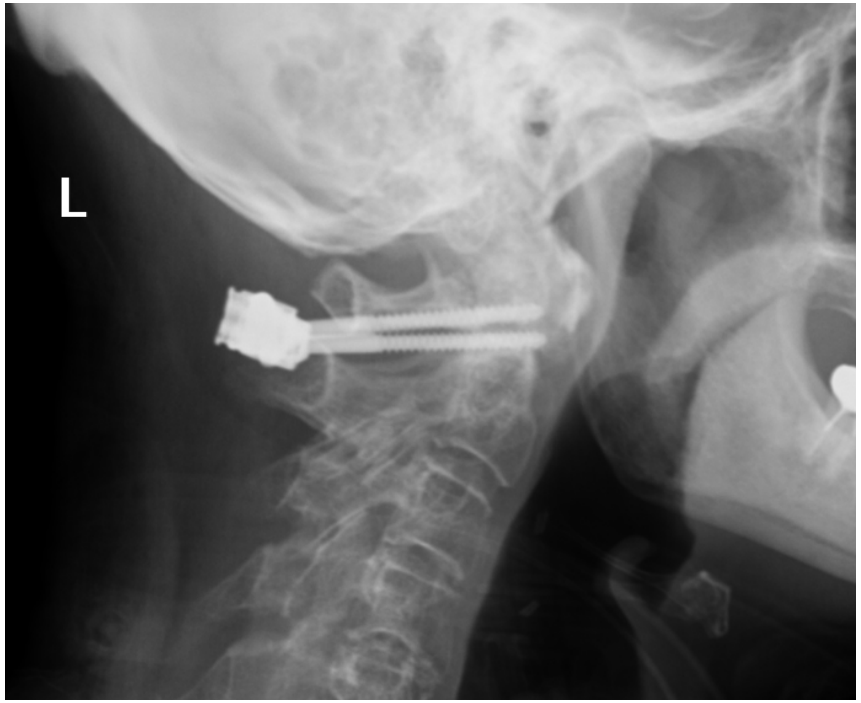
Median Follow-Up 7 months (range 1-91 months)

Post-Op Rigid Cervical Collar

- Median 12 Weeks (Range 6-20)

All 8 cases with follow up URXR demonstrating preserved alignment

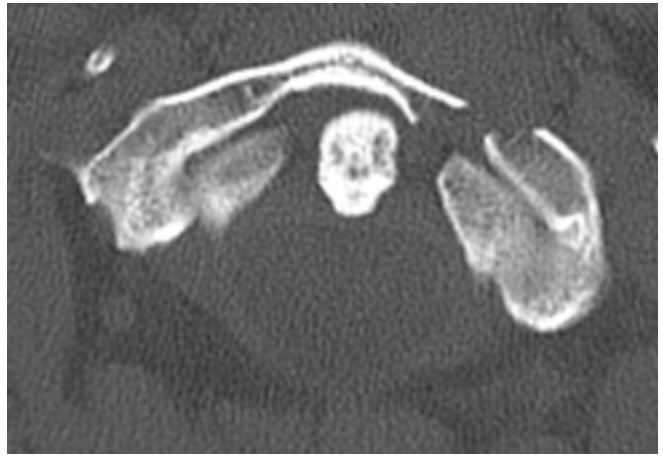




Outcomes

6 cases with follow up CT, all demonstrating development of osseous union across fractures

None with development of instability requiring C1-C2 or O-C fusion



Acknowledgments

- Yohannes Ghenbot
- Samuel Tomlinson
- Connor Wathen
- James Schuster
- Dmitriy Petrov
- Zarina Ali
- William Welch
- Ali Ozturk
- Jang Yoon
- Mert Marcel Dagli
- Daniel Yoshor
- H. Isaac Chen

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