

Go Ahead, Stick Your Neck Out: Cervical Spine Session

Chairperson: Phyllis Phillips, Esq
Monday, March 23rd, 2026
10:25-11:25am

Tony Tannoury, MD
Chadi Tannoury, MD
Roberto Feliz, MD
Leslie Giroux
Paul Lydeard, DPT

C1-2 and C5-6 skip Injury

SK 4032469

HPI: 33F unseatbelted rollover
automobile accident at high speed.
Presents with neck pain and scalp
lacerations

PMH: Healthy

PSH: none

Meds: none

FamH: no significant history

Soch: no smoker, social EtOH, no drugs

Exam:

BMI: 17

Ht: 5 feet (152cm)

Wt: 88 lbs (40 kg)

Subjective paresthesias in right
hand

Otherwise 5/5 motor, 2/2
sensation

no hyperreflexia or upper motor
neuron signs

Rectal intact

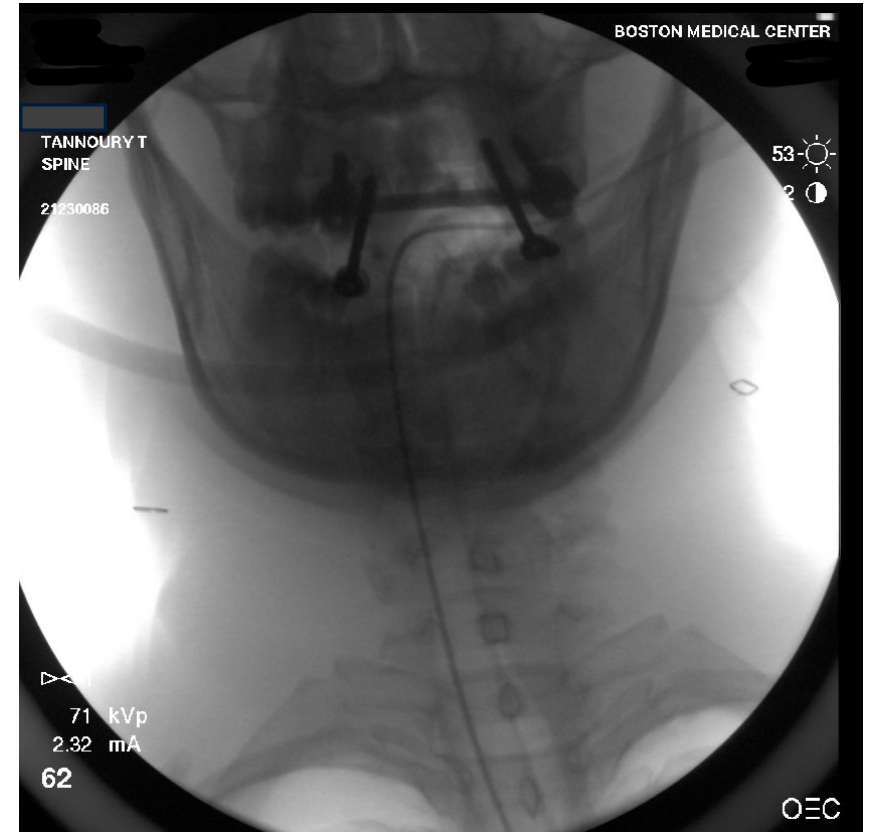
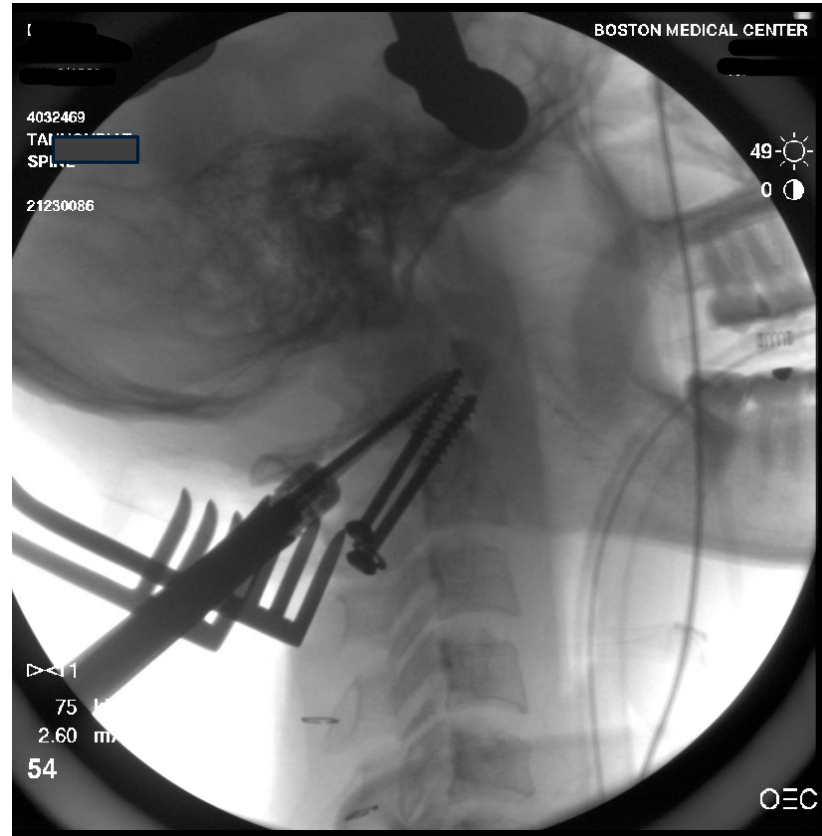
Labs normal

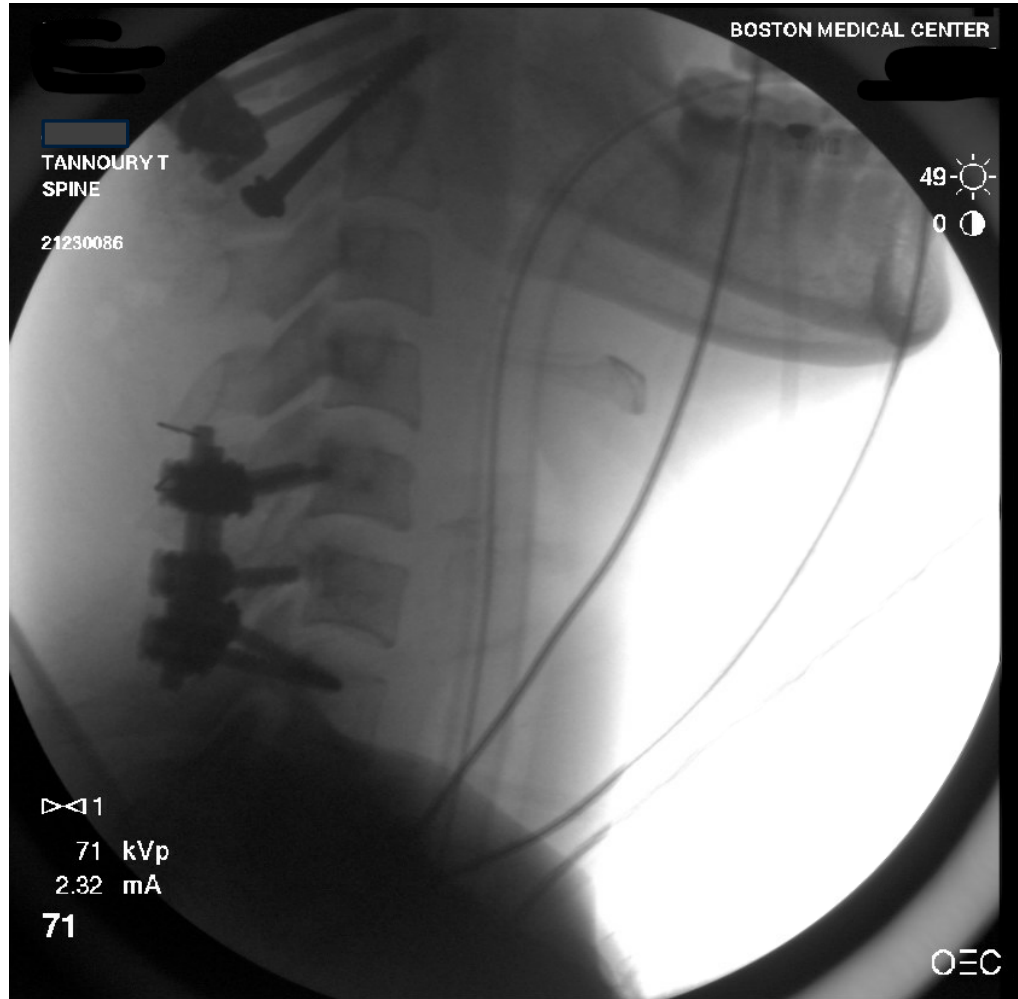




[PH] [RA]







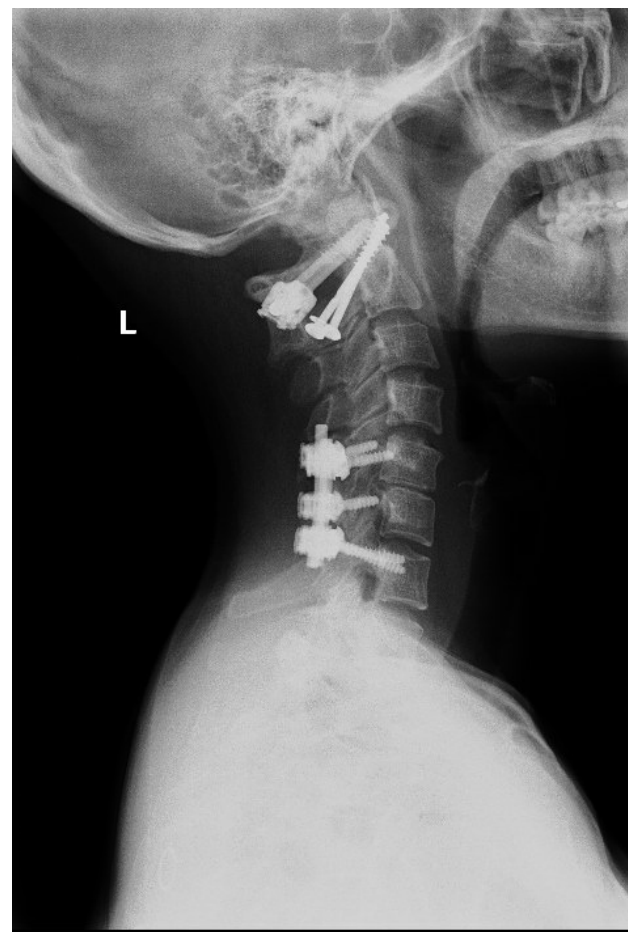




1 year post-op



8 years post-op



Complications of Cervical spine injections

Roberto Feliz, MD

Anesthesiologist / Interventional Pain Management

Boston Pain Center

Cervical Spine Case

Chadi Tannoury, MD, FAOA, FAAOS

Associate Professor, Orthopedic Surgery

Medical Director, Orthopedic Ambulatory Clinic

Director, Spine Research

Boston University – Boston Medical Center

Disclosures

Consultant: DePuy Synthes

Royalties:

- DePuy Synthes
- Wolters-Kluwer Publisher

Stocks: 4Web Medical

Most Educational Case?

If the Indication is clear?

If Benefits outweigh Risks ?

If the Rx is Patient-personalized ?

Case

A 45 year old Male – Construction worker

CC: Neck pain, difficulty with posture, disturbing “popping” sensation

Symptoms duration: 3 years

Injury History:

- 5 years ago: wooden pallet (30 lbs) fell onto upper back and neck
- Treated for 2 “Ruptured discs”: Cervical Disc Arthroplasty + cervical fusion
- RTW 9 months after surgery – did very well for 2 years

Work: Construction / modified

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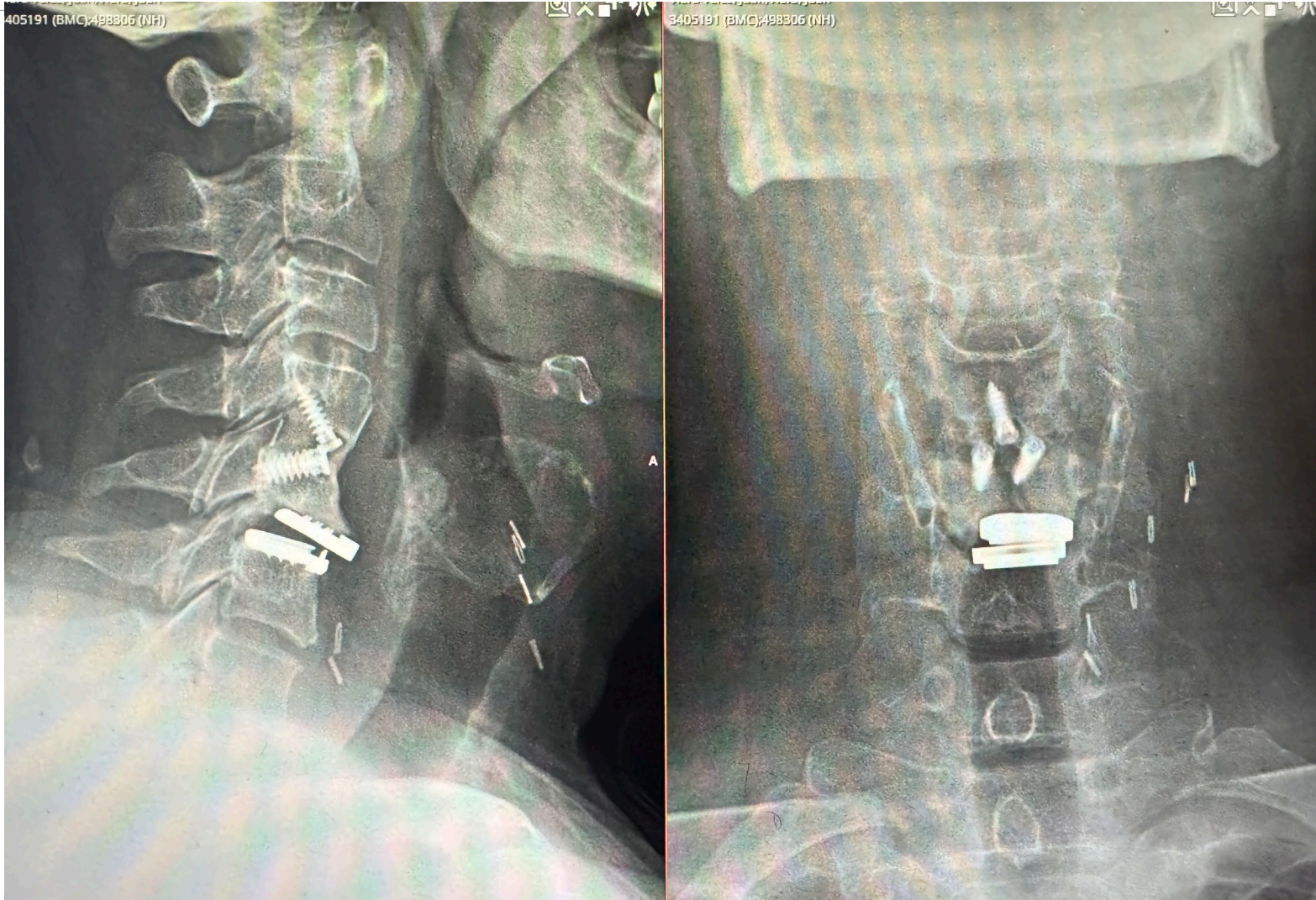
Physical Examination:

Neck: Stooped forward posture

Pain with neck extension

Neurologic grossly preserved

Imaging – X-rays



Imaging – CT / MRI



MDs:

C3-4?

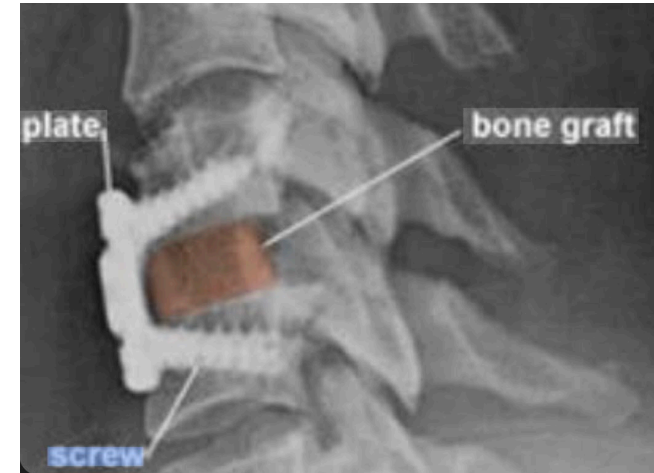
C4-5?

C5-6?

Cervical Disc Arthroplasty

Artificial disc replacement

Preserves ROM (Motion)



Decrease risk of adjacent DD

- ***Decrease Reoperation rate***

- 1 level: ACDF 17.3% vs CDA 4.5%
- 2 level: ACDF 21% vs. CDA 7.3%

Jackson JNS 2016 (5 yr f-up)

Cervical Disc Arthroplasty / Heavy Laborers?

- RTW:
 - Faster in CDA (4.3 mo) vs ACDF (6.7 mo)
- Disability
 - Greater improvement NDI in CDA (vs ACDF)
 - Similar Neck / Arm pain
- Adjacent Segment Disease @ 2 years:
 - Lower in CDA (vs ACDF)

Uppal et al, NASSJ 2025

Cervical Disc Arthroplasty / WC effect?

- RTW: Overall Slower in WC cohorts
- Disability: Overall Slower Improvement in WC cohorts
- Evidence?
 - Limited high quality Data
 - Safety regarding RTW **FULL** duty: remains un-answered
- Controversies:
 - Active-duty Military cohorts: RTD without restriction is high (92-95%)
 - Evidence in high impact Athletes / Heavy laborers: Limited
 - Definition of “Return to W” and “work intensity” vary significantly

Cervical Disc Arthroplasty / FAILURE?

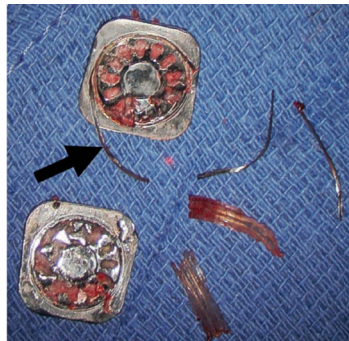
- Concerns with repetitive trauma

- Implant migration
- Implant dislocation

- Traumatic Migration / Extrusion (BRYAN, ProDisc-C) after Relatively Low-Energy Trauma!

Wagner et al, Global Spine J 2015

- Catastrophic Device Failures (M6-C prosthesis): with CORD injury



Carrera et al, J Neurosurg Case Lesson 2022

Cervical Disc Arthroplasty

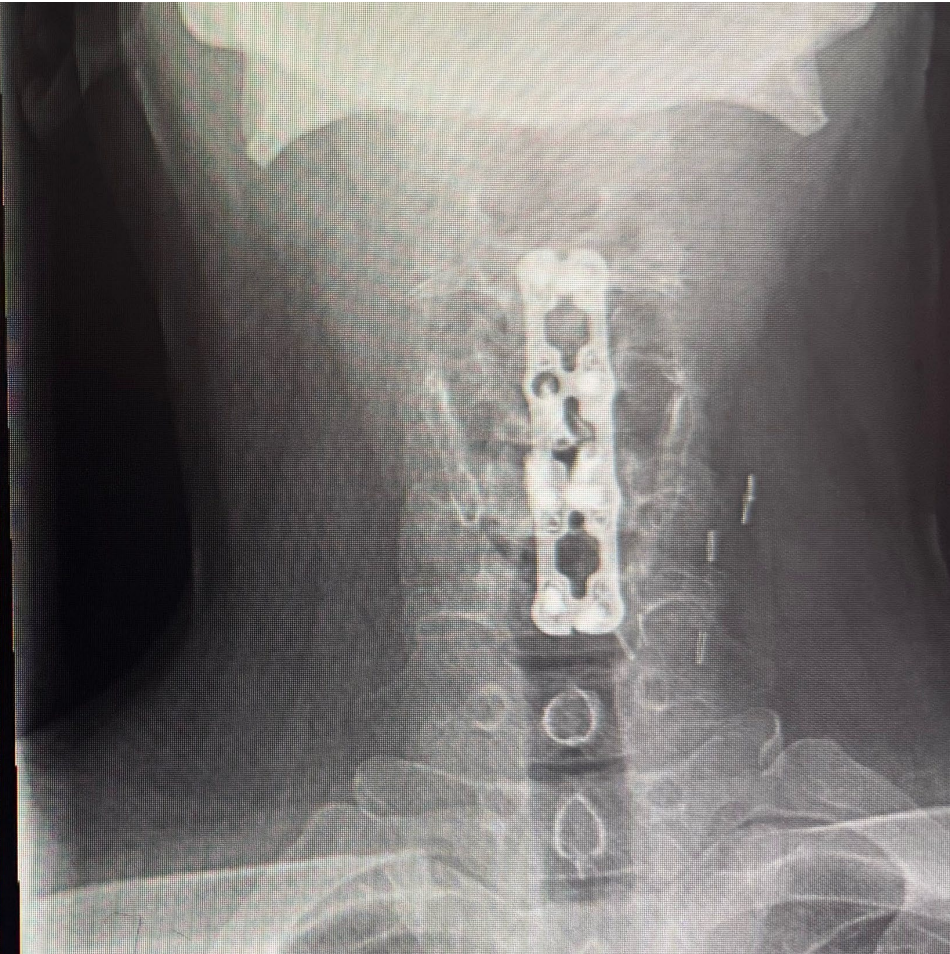
LEARNING POINTS

Cervical Disc Arthroplasty – Counseling!!

In heavy laborers & patients w risks of recurrent trauma: Construction, Firefighting, Law-enforcement, etc.

1. Early period matters (first 8-12 weeks): Avoid jolting loads/ repetitive impacts
2. Job a/w Frequent impacts: Discuss risks (migration, dislocation, etc.) - **REVISION**
3. Patient selection: Avoid in severe DDD, spondylolisthesis, osteoporosis

Cervical Disc Arthroplasty – Counseling Revision Surgery



Complications of Cervical Spine Injections

CASE REVIEW & CLINICAL LESSONS

WC MEDICAL CONFERENCE

Case Summary

- 36-year-old female
- Underwent selective transforaminal right C6 nerve root block, related to Work Injury.
- Immediate severe spinal cord ischemia
- Resulting right-sided weakness & sensory loss
- Progressed to CRPS with intractable pain, central sensitization, neuroinflammation and severe wind-up

Clinical Image – CRPS Lower Extremity



Clinical Image – Bilateral Foot Dysautonomia & Edema



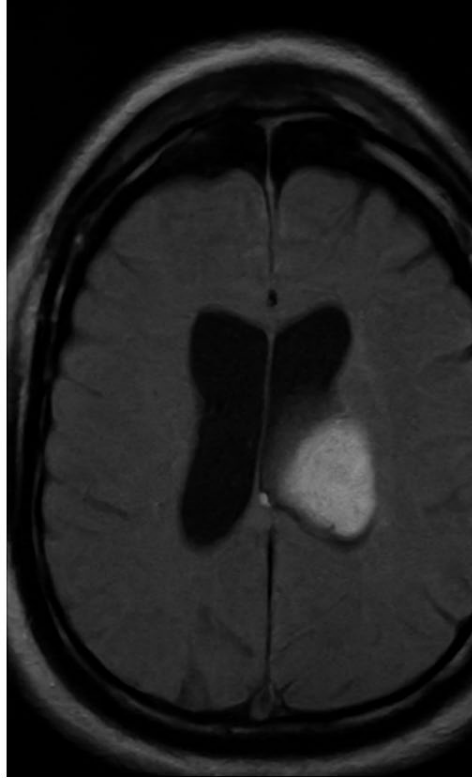
Clinical Image – Severe CRPS



Axial T2 – Cervical Spinal Cord Infarction



SEVERE CRPS



**SPINAL CORD
INFARCTION**

Major Complications of Cervical Spine Injections

- Spinal cord ischemia & infarction
- Vertebral or radicular arterial injury
- Epidural hematoma
- Direct spinal cord trauma
- Nerve root injury
- Dural puncture & CSF leak

Mechanisms of Injury

- Inadvertent arterial injection → embolic infarction
- Particulate steroid occlusion of radiculomedullary vessels
- Needle malposition → direct neural axis trauma
- High-risk anatomy at C5–C7 foramina
- Variant vascular patterns increasing vulnerability

Clinical Presentation

- Sudden severe neck pain
- Acute neurological deficits (weakness, paresthesia)
- Loss of sensation or proprioception
- Autonomic dysfunction
- Onset or progression of CRPS

CRPS After Cervical Procedures

- Triggered by nerve trauma or ischemia
- Persistent burning pain, allodynia, hyperalgesia
- Central sensitization → severe wind-up
- Neuroinflammatory cascade perpetuating symptoms
- Motor dysfunction and significant functional decline

Risk Mitigation Strategies

- Prefer non-particulate steroids (e.g., dexamethasone)
- Use real-time fluoroscopy + contrast
- Avoid high-risk vascularized foramina
- Consider alternative approaches (interlaminar)
- Immediate cessation if pain/paresthesia occurs

Key Takeaways

- Cervical transforaminal injections carry unique vascular risks
- Spinal cord ischemia is rare but catastrophic
- Rapid recognition & intervention may reduce permanent deficits
- Detailed informed consent is essential
- CRPS and central sensitization are potential long-term sequelae

Cervical complications of cervical injections

Settlement:

I never get involve with settlements. This will be costly.

15 year cost of future treatment: >\$1.7 M

Thank you!