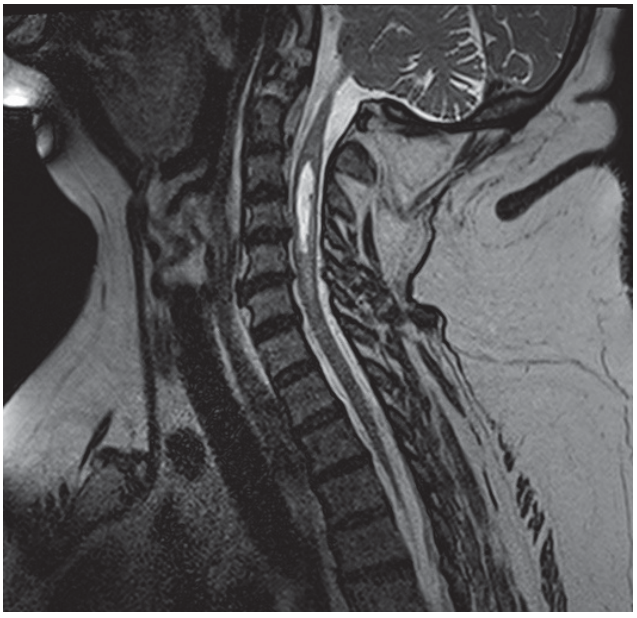
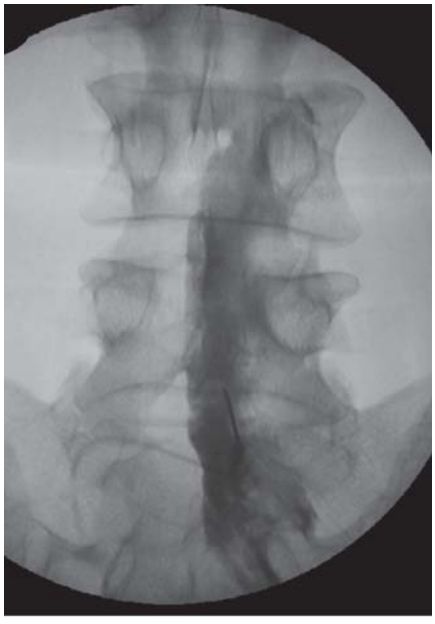
Complications of Interventional Pain Management



Dr. Ian Beauprie, MD, FRCPC
Pain Management Unit, Dalhousie University

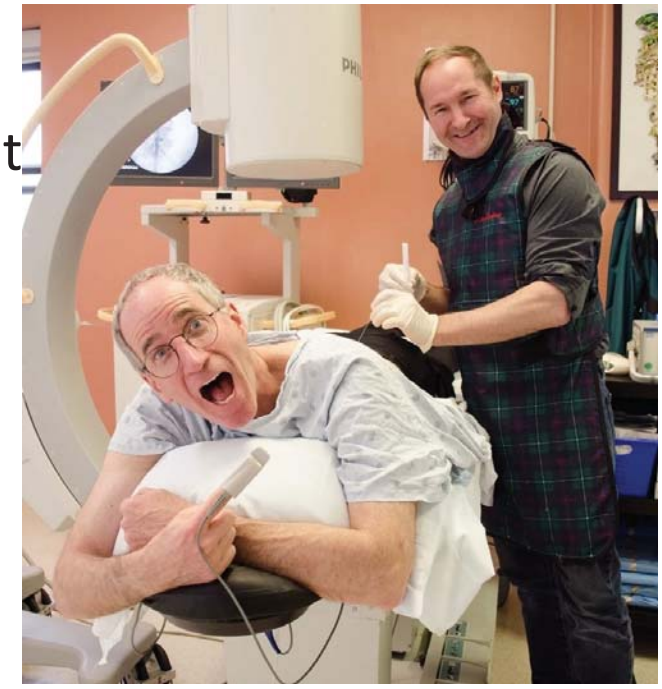
Conflict of interest/bias

- Fees from both CMPA and plaintiff counsel for expert witness work.
- I have caused some complications
- Spent some time in court…not for my own cases.
- I spend 2 days a week doing pain interventions



Objectives

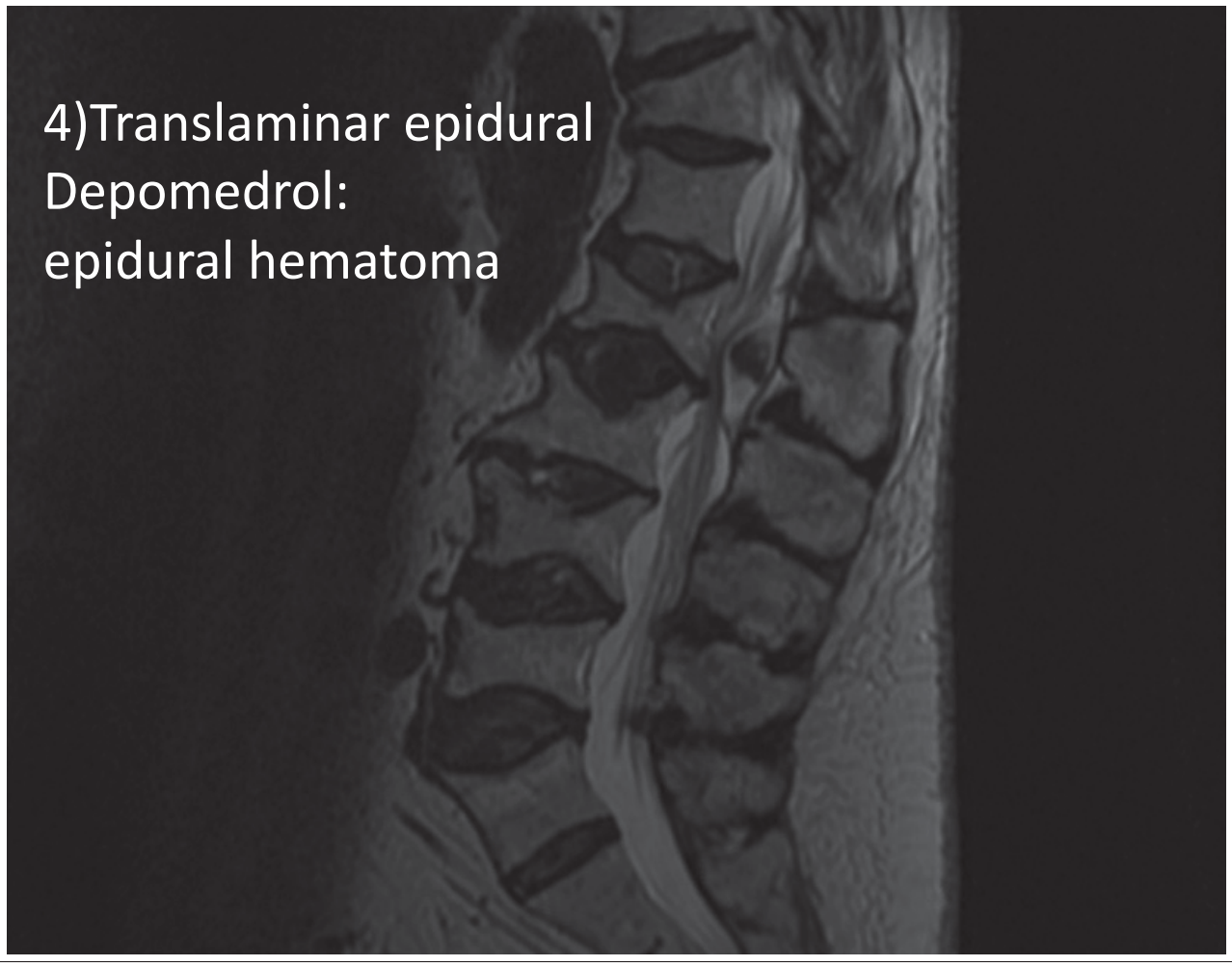
- Bleeding
- Needle misplacement
- Steroid embolic infarct
- Infection control
- Resuscitation

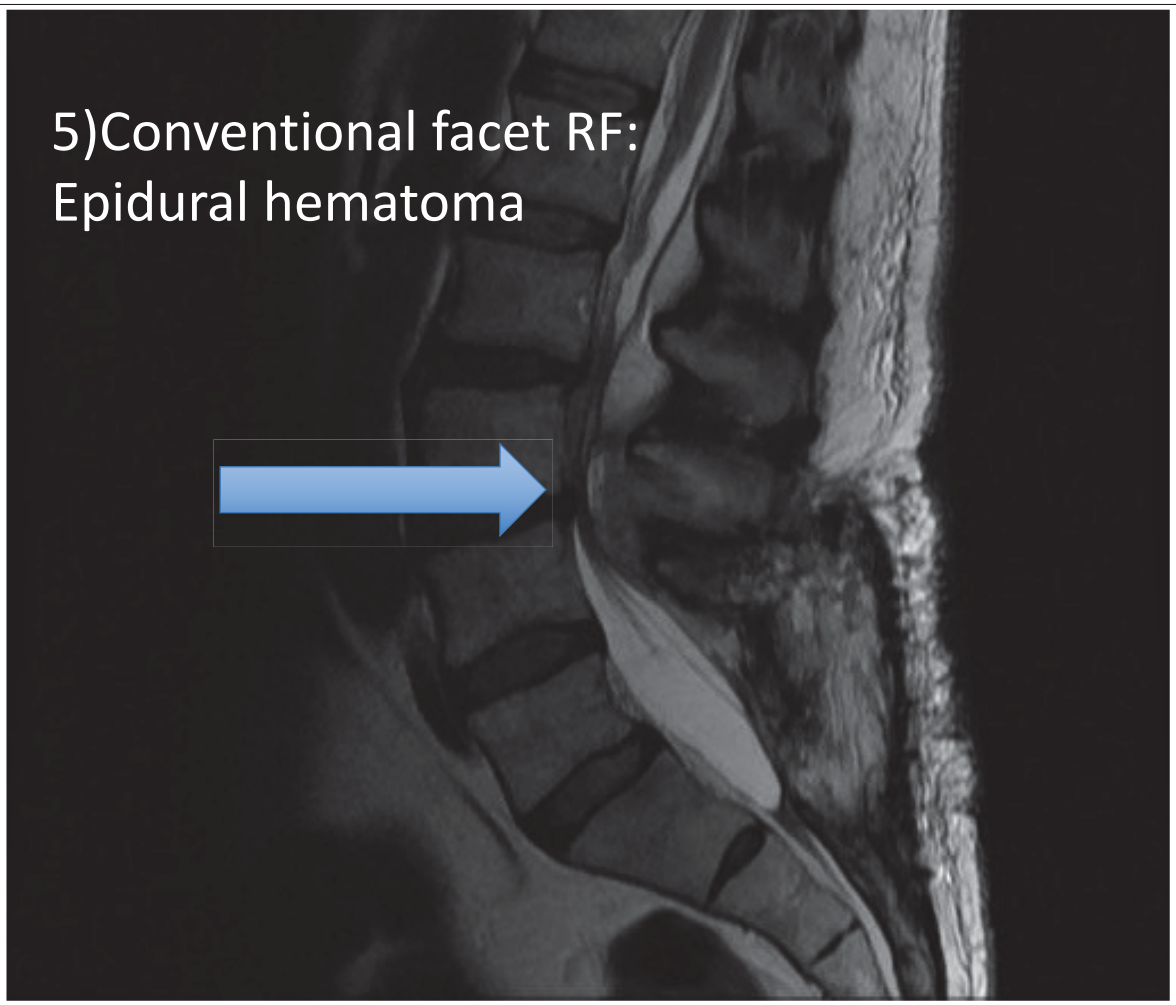


Bleeding

My first five epidural hematomas:

- 1) 1993: 88yo fem-pop under epidural, heparinized postop for cold foot. Confused, claimed to feel foot on APS rounds. 12 hrs later complete motor loss noted, fixed hematoma
- 2) 1995: AAA repair, T9 epidural, lifelong cognitive limitation (=Down's), eager to please. Insists legs are getting stronger, sensory level descending. Next shift noted complete paraplegia on exam
- 3) 1998: Fem-Pop graft, severe COPD, spinal anesthetic. Wears of at last groin staple. That night cold leg, heparinized, lab results confused with the other 'John Smith' on ward, over-heparinized, paraplegic on am rounds. Confusion over duration of paresis precludes surgical decompression.





Update: Epidural hematoma risks are higher than we thought:

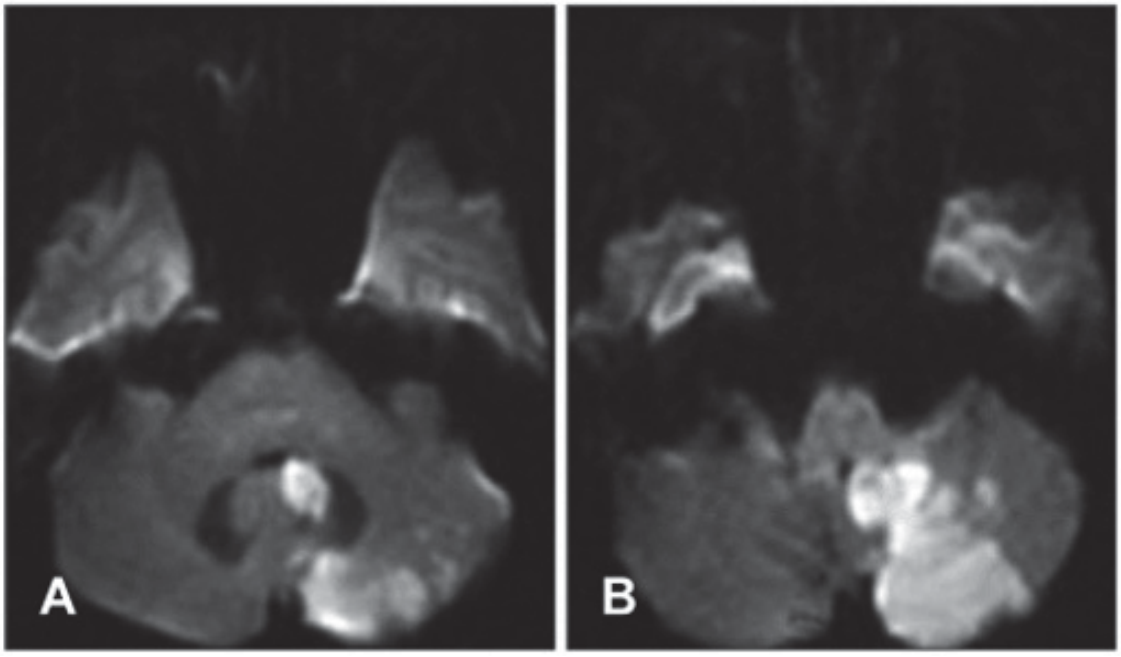
Pitkanen (Finland 2001-2009—1.4 million blocks)

-1/60,000 spinals (OR)
-1/15,000 epidurals (OR)
-1/2,400 epidurals (**pain**)

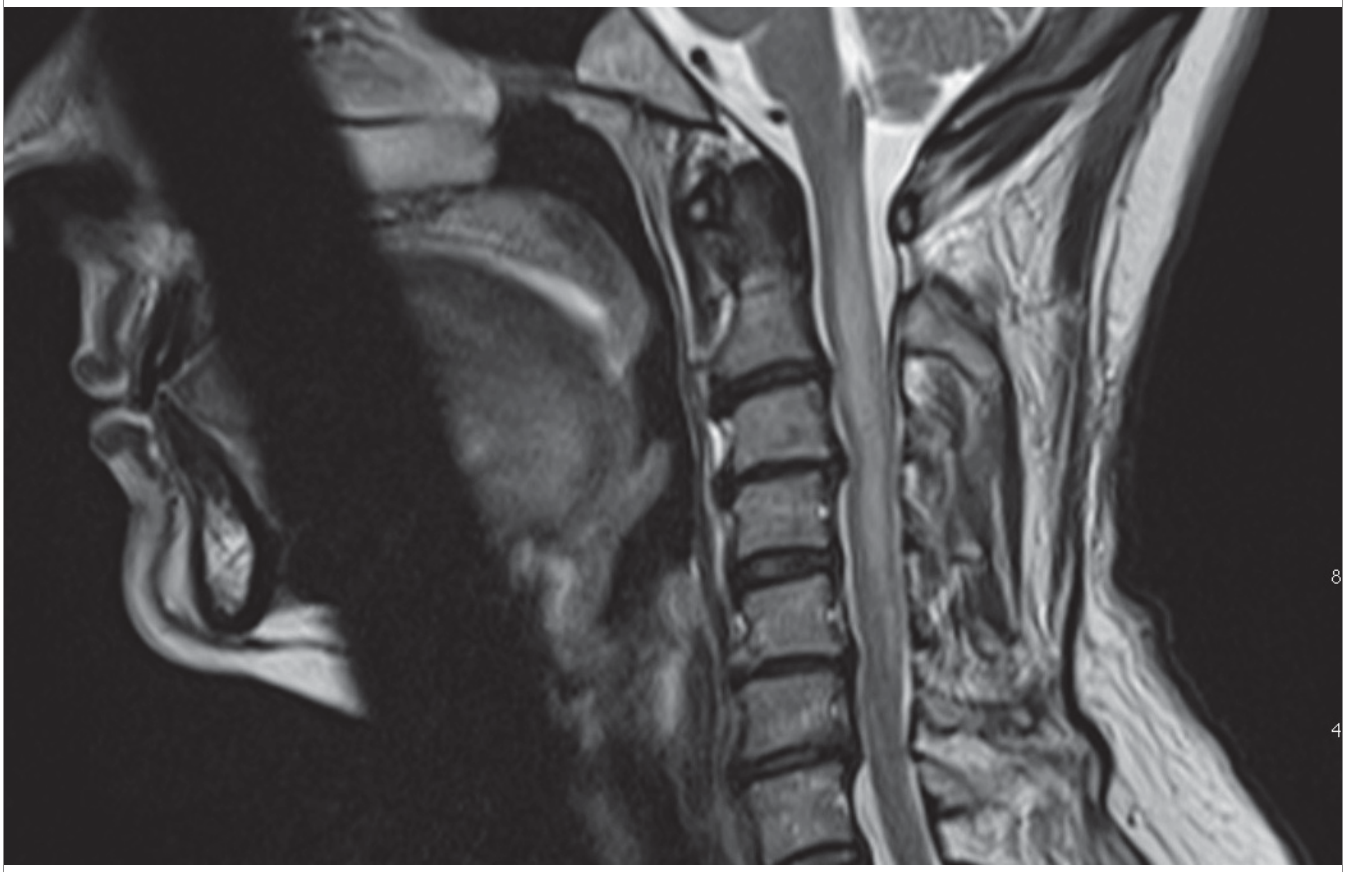
Acta anes Scand 2013

- Lagerkranser Scan J Pain 15(2017)
  - 166 case reports of spinal hematomas 1994-2015.
  - Bloody tap
  - Elderly female
  - Perc spinal stim (0.75%)

Needle placement

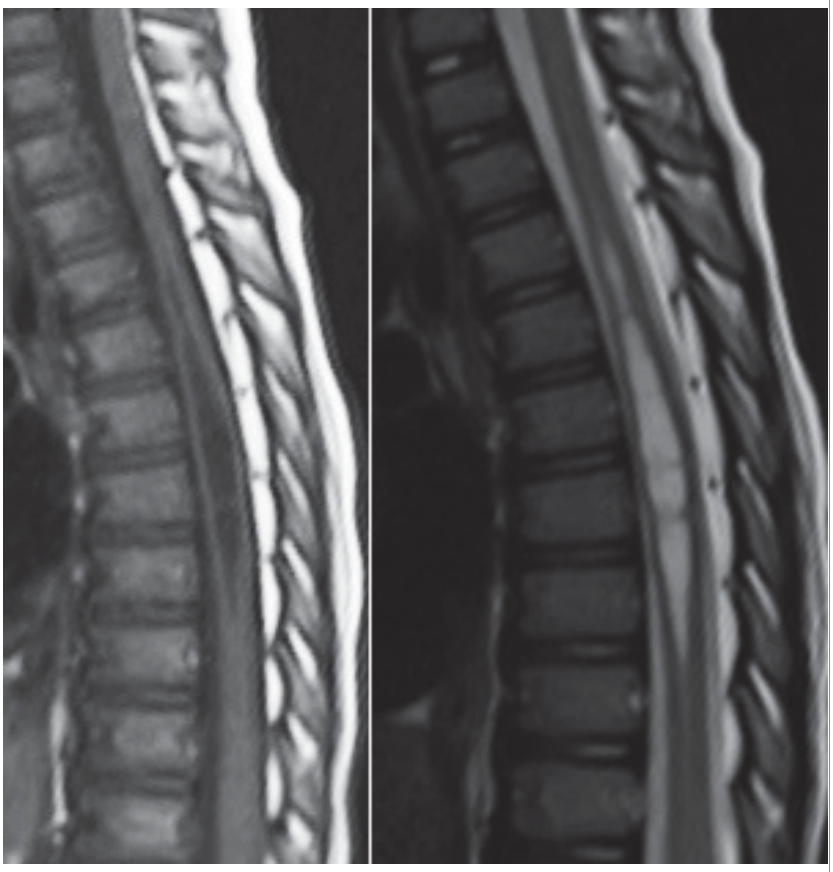


Cervical facet median branch RF: Brainstem stroke/vertebral artery injury.



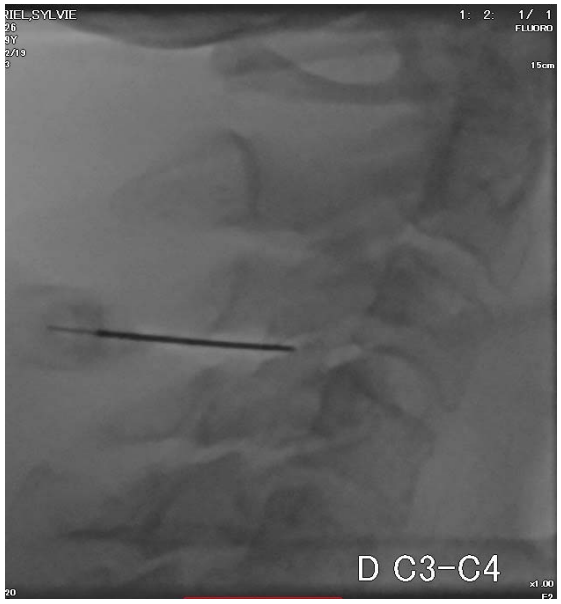
Cervical facet median branch RF: cord edema after possible direct needle trauma

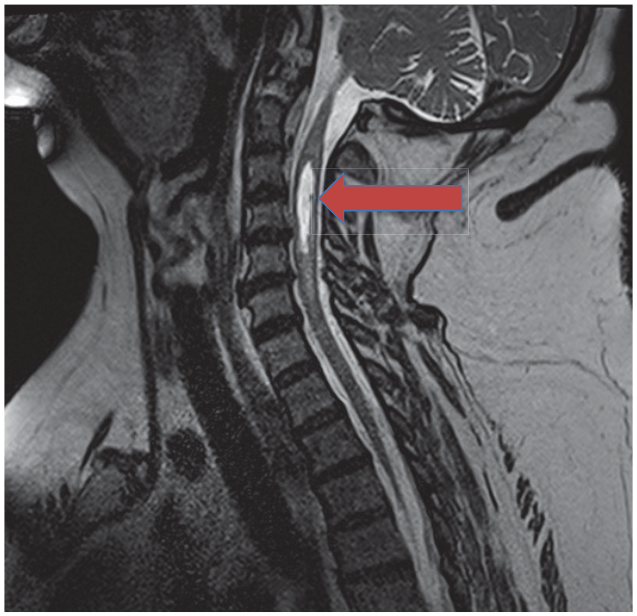
Intrathecal pump placement: traumatic conus injury, secondary syringomyelia



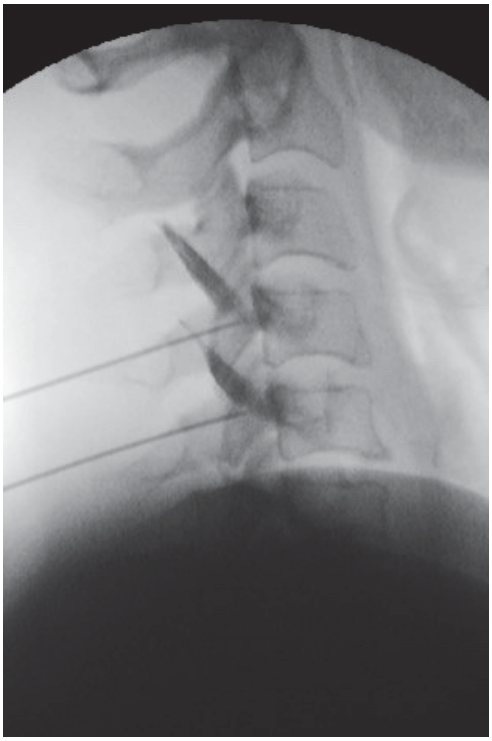
Cervical facet steroid:

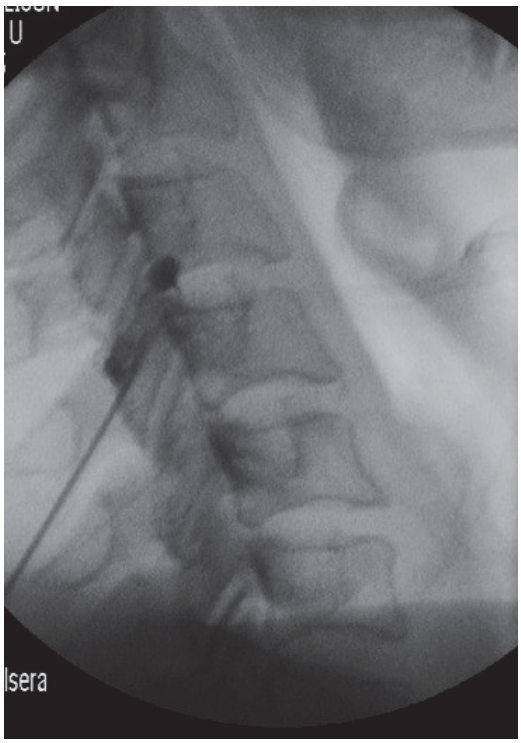
Rt arm motor/sensory loss: cord injury

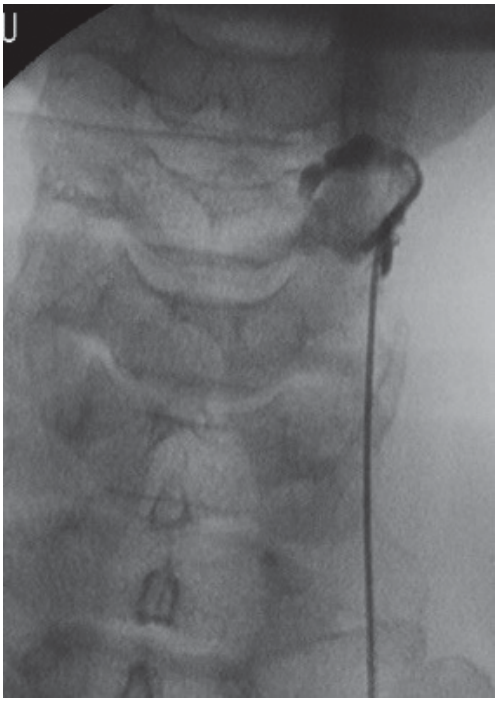


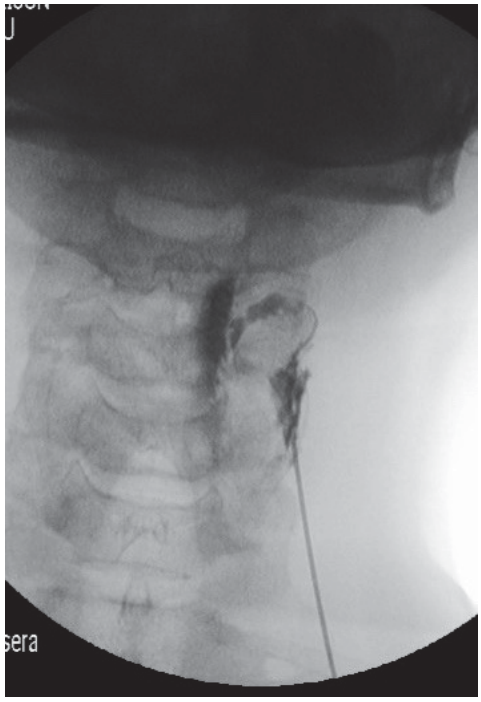


How could this happen?









www.apsf.org

NEWSLETTER

The Official Journal of the Anesthesia Patient Safety Foundation

Volume 20, No. 3, 45-60 Circulation 76,548 Fall 2005

The APSF wishes to extend its concern, sympathy, and support for the victims of Hurricane Katrina. This disaster continues to affect citizens of Gulf Coast communities in a devastating way. In addition, health care providers throughout the country have been impacted by this national tragedy.

One relatively small effect of this dis-

Complications of Cervical Epidural Blocks Attract Insurance Company Attention

The Doctors Company has noted an alarming incidence of major claims relating to cervical epidural steroid blocks. In fact, the number of claims for these blocks consistently exceeds the combined total of claims for steroid blocks performed at all other levels.

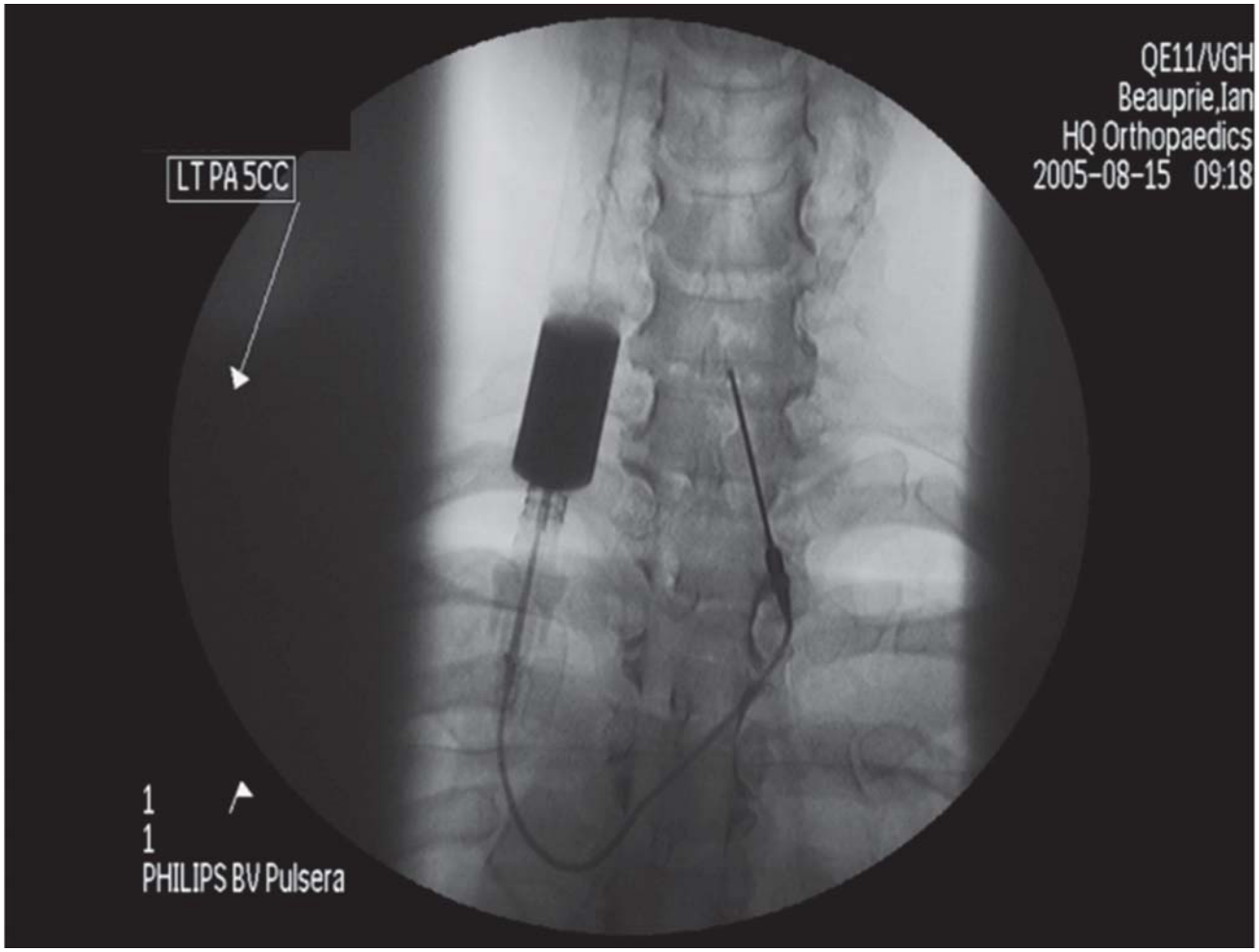
By Ann S. Lofsky, MD

Epidural steroid injections are widely used in the United States to treat chronic and acute pain. It is commonly accepted that these procedures have risks, although the general perception is that their incidence is low. Recent discussions in the anesthesia literature regarding complications of epidural steroid injections include an article in the *Anesthesia Patient Safety Foundation (APSF) Newsletter*[1] and a report of the American Society of Anesthesiologists Closed Claims Project.[2] The closed claim study reported that 114 out of the 276 claims for invasive pain procedures concerned epidural steroid blocks. Both articles, however, included epidurals performed at all levels (cervical, thoracic, lumbar, and caudal) in their discussions and conclusions.

While malpractice data naturally suffer from the handicap of missing denominators, discussions with have described serious complications have largely been isolated case reports referring to 1 or 2 instances of cord trauma causing permanent injury.[7,8]

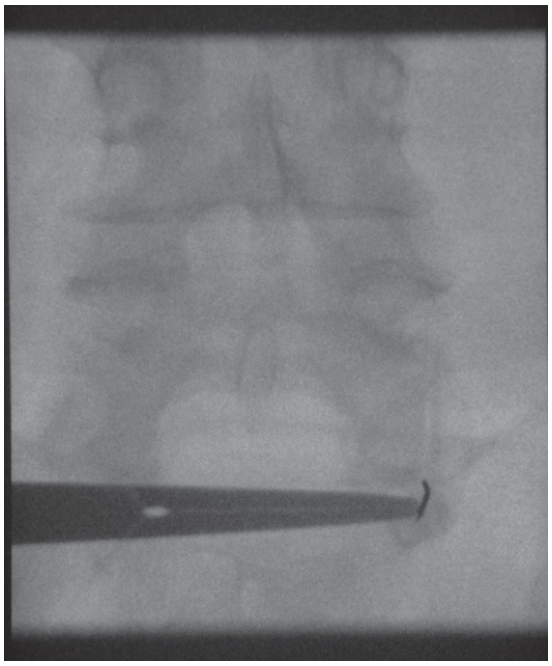
The Doctors Company recently collected and reviewed 13 anesthesiology claims involving allegations of arachnoiditis, paralysis, anoxic brain damage, or death following cervical epidural steroid injections. These claims were accumulated over a 3-year period and were generated by approximately 2,800 insured anesthesiologists, only 64 of whom self-identified as full-time pain management physicians. Those claims are discussed with the goals of delineating the risks involved with cervical epidural steroid blocks and identifying possible loss prevention strategies that might help to avoid similar patient injuries.

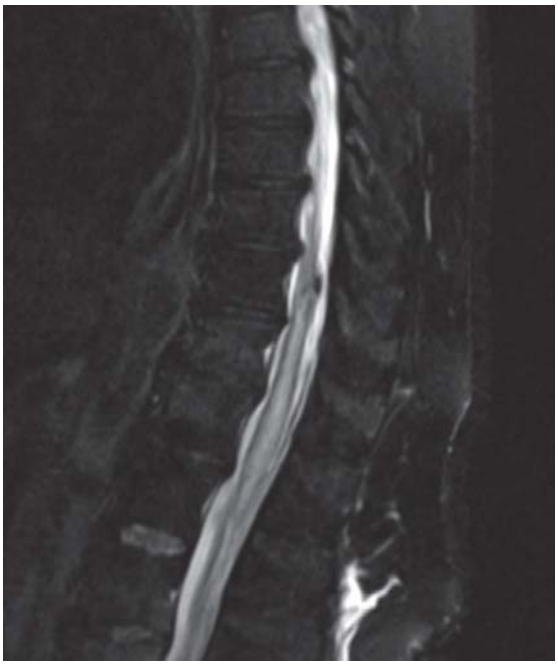
Claim Characteristics

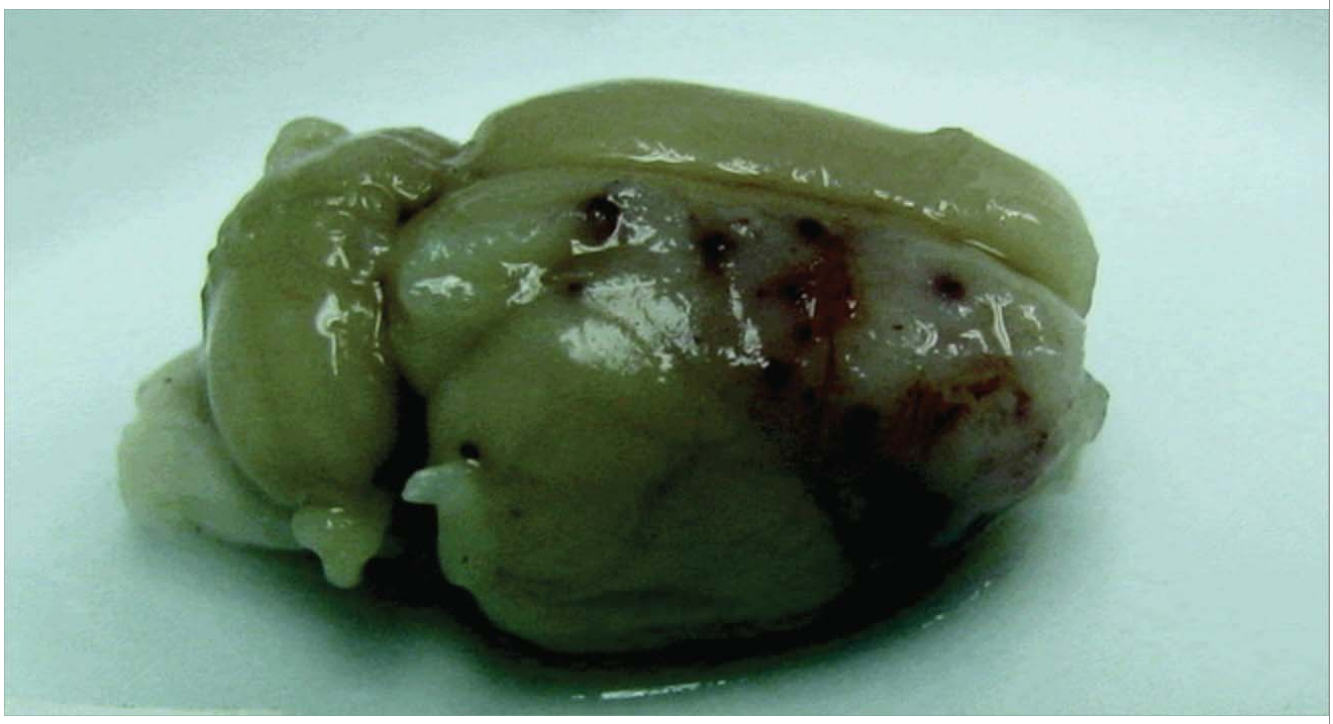


Embolic steroid infarct

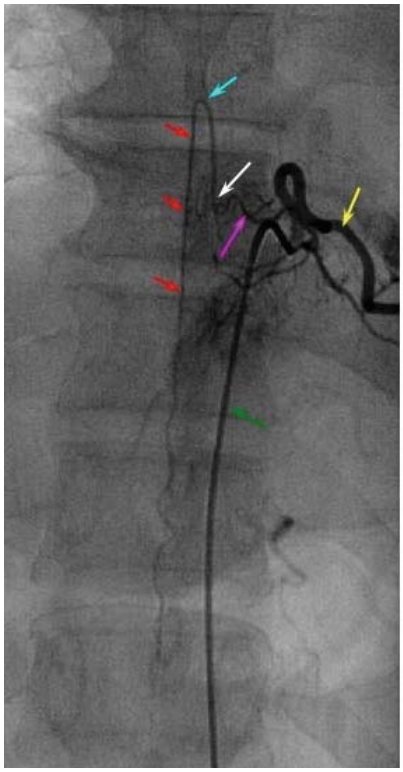
Lumbar facet steroid: immediate flaccid paraplegia

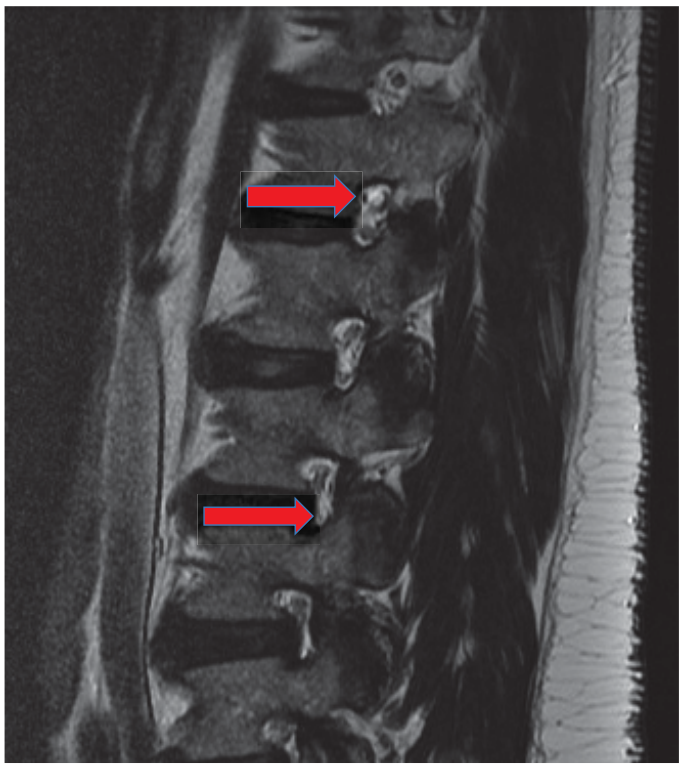






Moeller-Bertram UCSD (Spine 2009)





U.S. Food and Drug Administration
Protecting and Promoting *Your* Health

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WARNING

- add information that Kenalog is not for epidural use and to add information to the Warning section that epidural use is not recommended.

Neurologic

- to include information regarding adverse events with epidural administration of corticosteroids.

ADVERSE REACTIONS

- revisions to the products labels to include information regarding adverse events with epidural administration of corticosteroids.

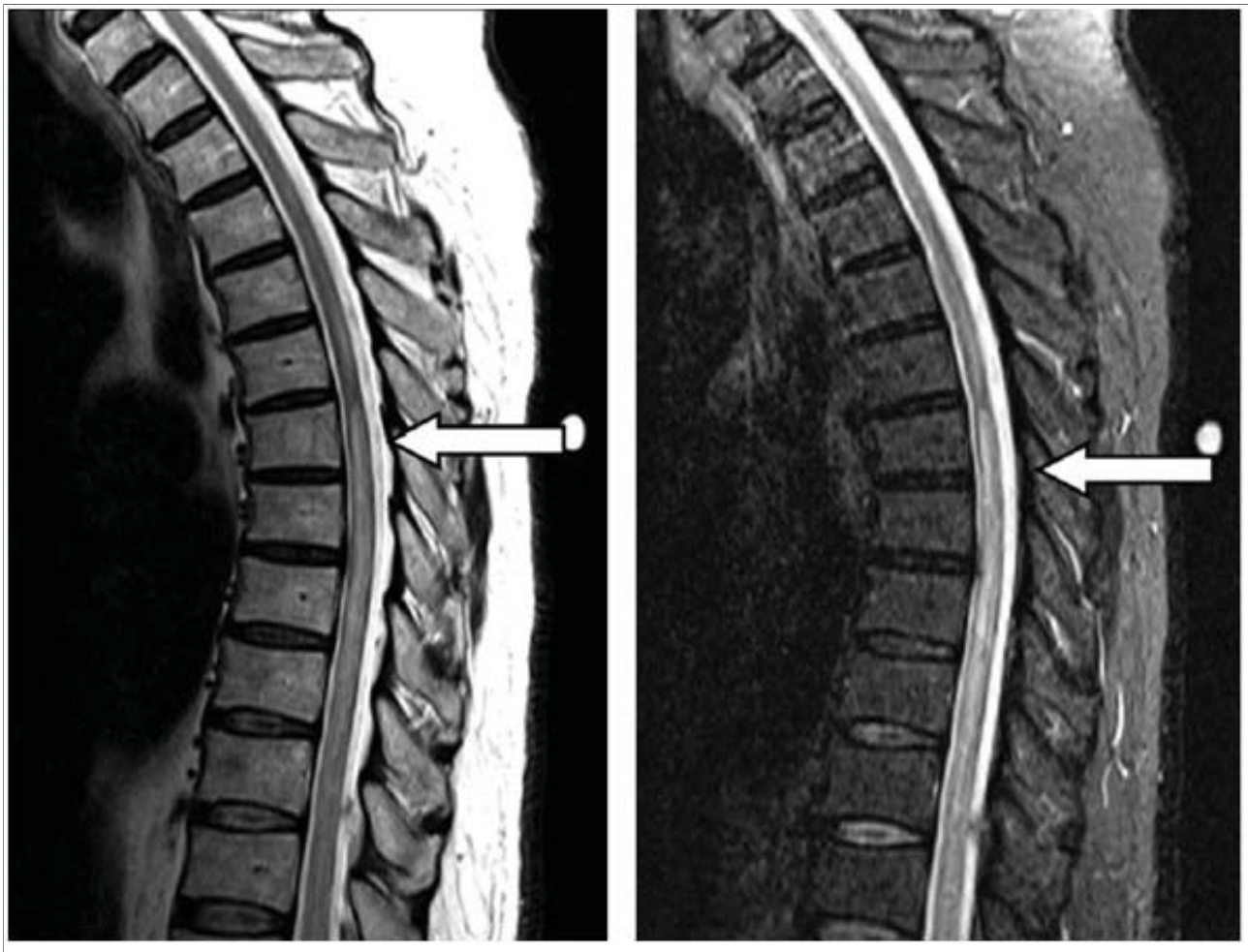
Drug Safety Labeling Changes

WARNINGS

Neurologic/Psychiatric: Convulsions, depression, emotional instability, euphoria, headache, increased intracranial pressure with papilledema (pseudotumor cerebri) usually following discontinuation of treatment, insomnia, mood swings, neuritis, neuropathy, paresthesia, personality changes, psychiatric disorders, vertigo. Arachnoiditis, meningitis, paraparesis/paraplegia, and sensory disturbances have occurred after intrathecal administration. Spinal cord infarction, paraplegia, quadriplegia, cortical blindness, and stroke (including brainstem) have been reported after epidural administration of corticosteroids (see **WARNINGS: Neurologic**).

of

corticosteroids.



Pain Medicine

Pain Medicine 2014; 15: 548–555
Wiley Periodicals, Inc.

SPINE SECTION

Original Research Articles

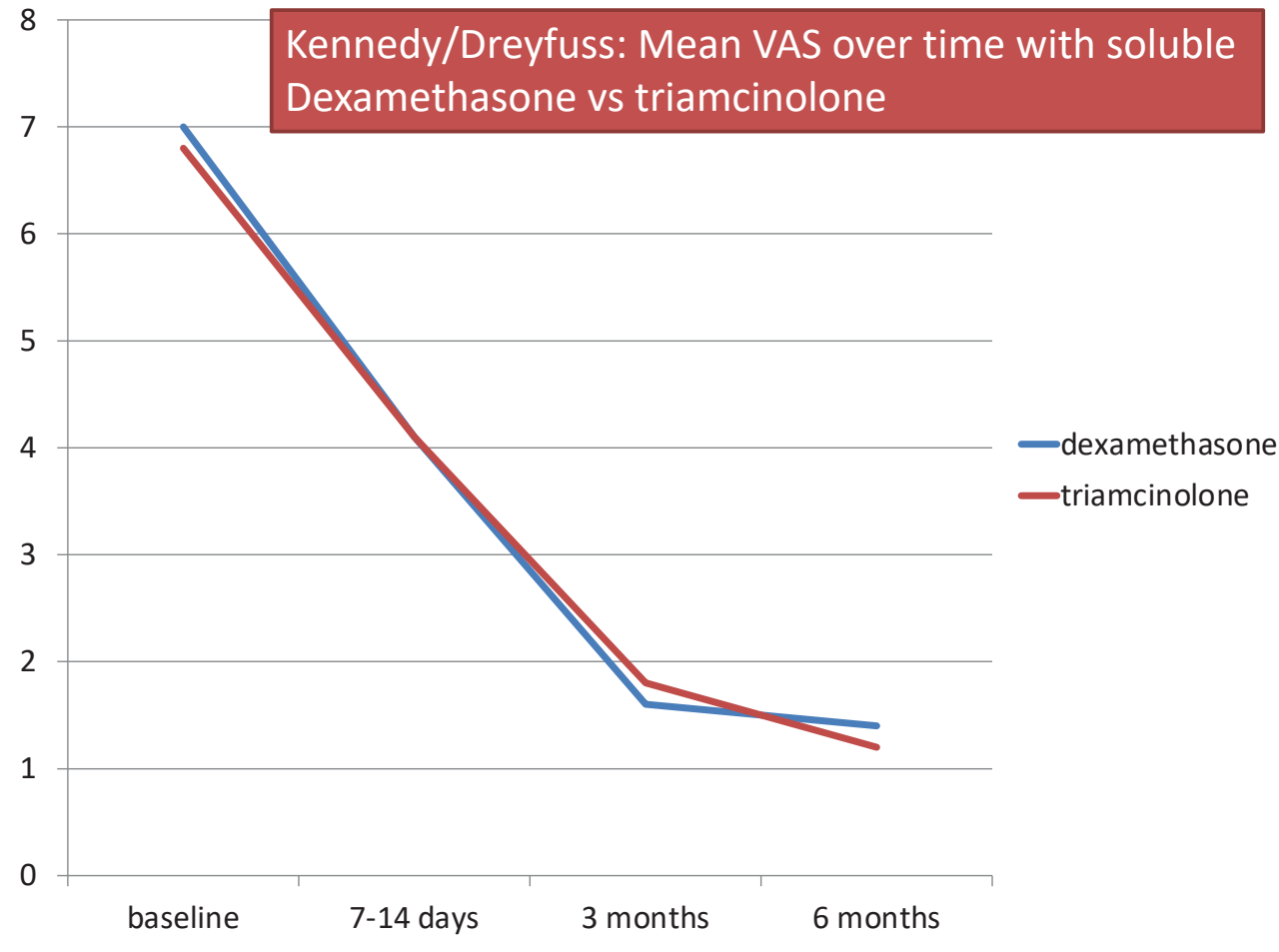
Comparative Effectiveness of Lumbar Transforaminal Epidural Steroid Injections with Particulate Versus Nonparticulate Corticosteroids for Lumbar Radicular Pain due to Intervertebral Disc Herniation: A Prospective, Randomized, Double-Blind Trial

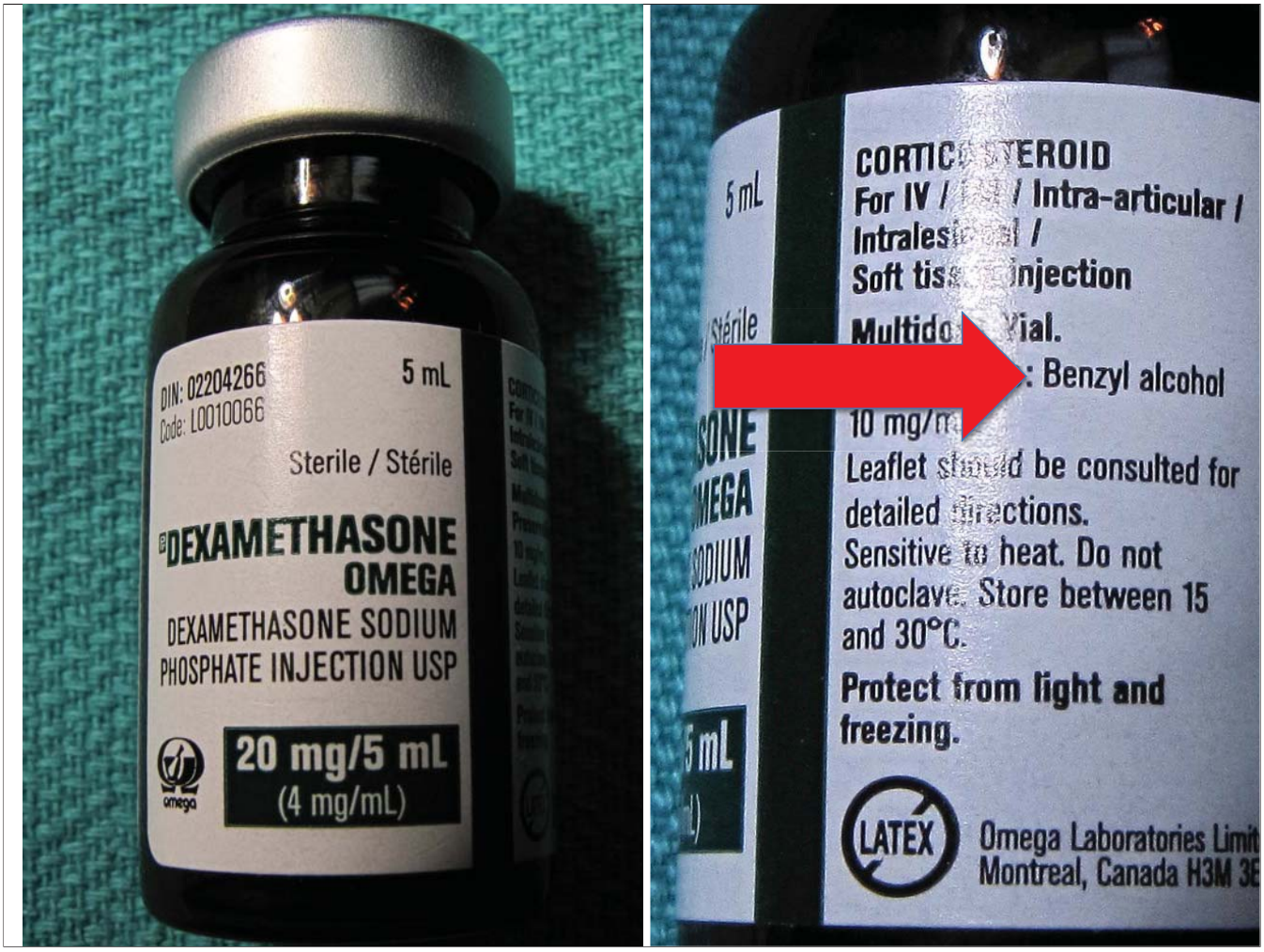
78 subjects mean 36 years old, 2/3 male, mean pain duration 9 weeks. Ended prematurely after FDA specified triamcinolone not for epidural use

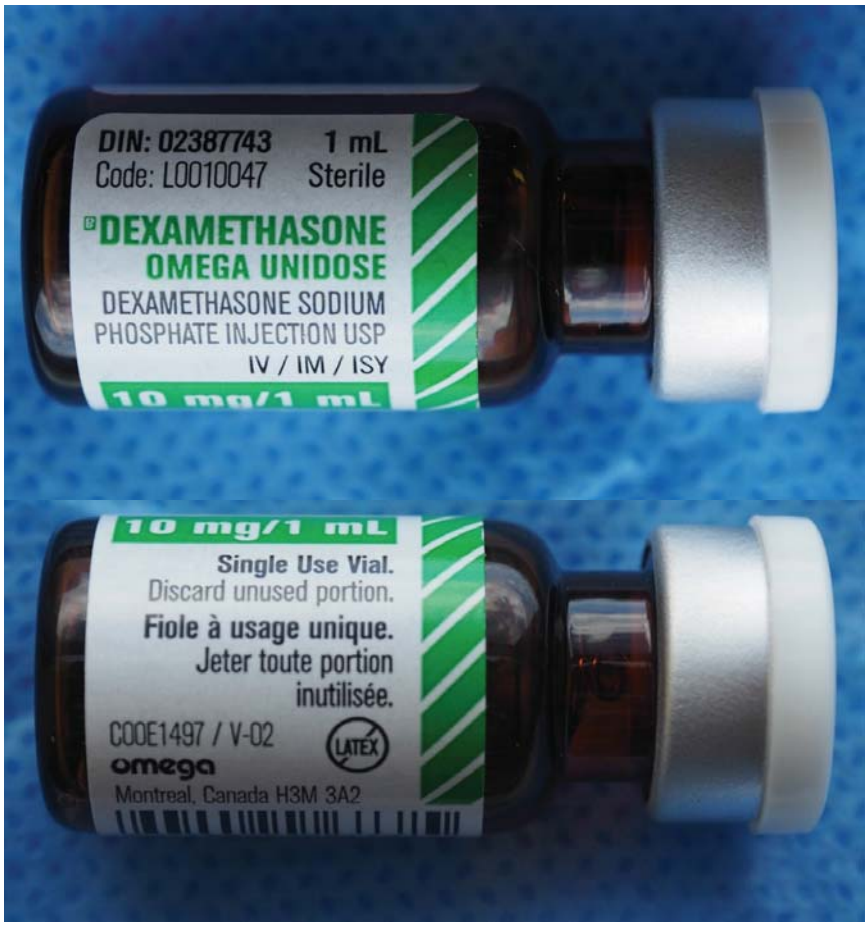
David J.
MD,† Elle
Joshua D
James S

*Department of Orthopaedic Surgery, Stanford University, Redwood City, California;

manuscript. The manuscript has not been previously published.




DIN: 02204266
Code: L0010066
5 mL
Sterile / Stérile
DEXAMETHASONE
OMEGA
DEXAMETHASONE SODIUM
PHOSPHATE INJECTION USP
20 mg/5 mL
(4 mg/mL)
omega
5 mL
For IV / Intra-articular /
Soft tiss injection
Benzyl alcohol
Leaflet should be consulted for
detailed directions.
Sensitive to heat. Do not
autoclave. Store between 15
and 30°C.
Protect from light and
freezing.
LATEX
Omega Laboratories Limit
Montreal, Canada H3M 3E


DIN: 02387743
Code: L0010047
1 mL
Sterile
DEXAMETHASONE
OMEGA UNIDOSE
DEXAMETHASONE SODIUM
PHOSPHATE INJECTION USP
IV / IM / ISY
10 mg/1 mL
Single Use Vial.
Discard unused portion.
Fiole à usage unique.
Jeter toute portion
inutilisée.
C00E1497 / V-02
LATEX
omega
Montreal, Canada H3M 3A2

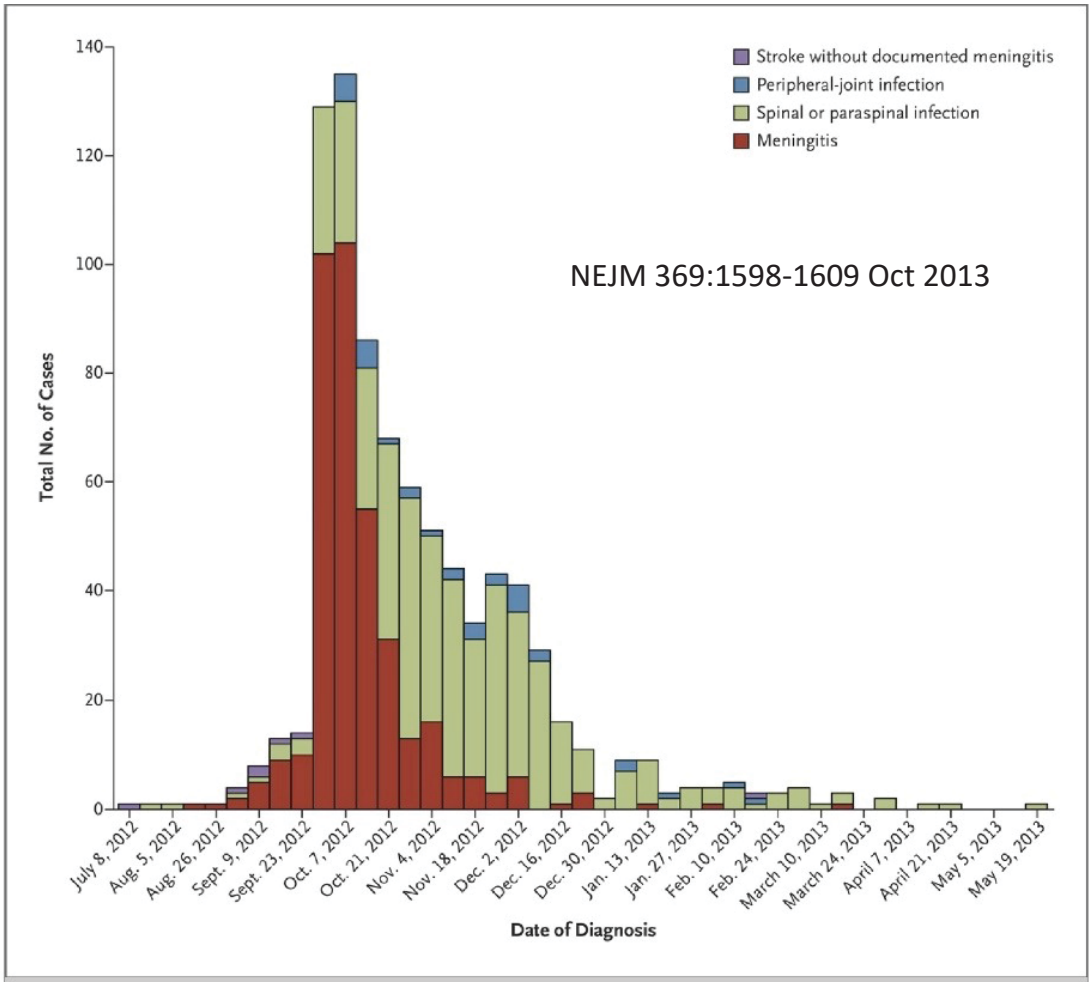
Multi-Society Pain Work Group

- Formed at the request of the medical directors on Medicare across the country
- Every pain society was invited to be part of MPW
- One vote per society on local coverage determinations (LCD) to be reviewed
- To Determine "**best practices**"
- Who is involved in MPW?:
  - ASRA, ASA, AAPM, APS, ISIS, AAOS, NANS, NASS, American Academy of Physical Medicine and Rehabilitation, American Association of Neurological Surgeons, American College of Radiology, Society of interventional radiology, America Society of Spine Radiology, American Society of Neuroradiology

Additional Suggested Procedural Considerations:

3. Methods to reduce risk of inadvertent vascular injection of particulate steroids with subsequent spinal cord ischemia exist for the performance of TFESIs. These methods should be understood and their use is strongly encouraged. At a minimum, this entails the **use of live fluoroscopy with injection of contrast medium** to identify any evidence of central vascular uptake. If available, digital subtraction angiography is recommended to maximize the practitioner's ability to recognize inadvertent vascular uptake. One should not inject active agents (anesthetic and/or corticosteroid) in the face of central vascular uptake. Safety is enhanced if, at the L3 level and above, only non--particulate corticosteroids are injected when performing transforaminal injections.

Infection



NEJM 369:1598-1609 Oct 2013

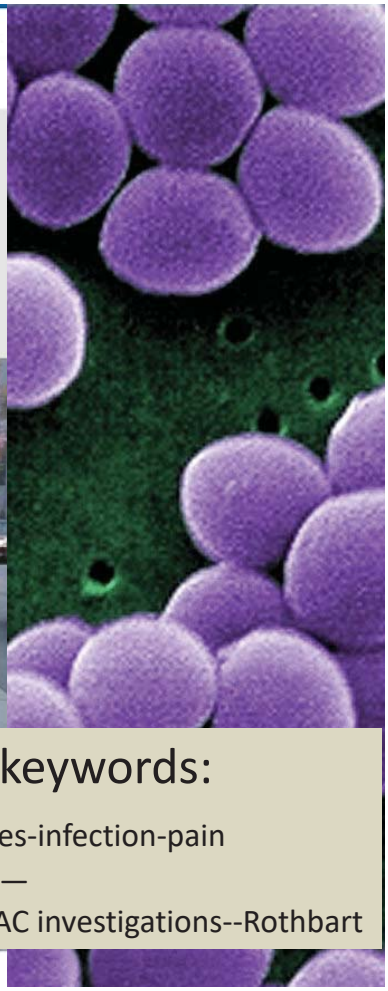
thestar.com

News · GTA

Patients sue doctor after suffering infections, serious illnesses under his care

Dr. Stephen James was suspended from the CPSO after he was found to have treated patients in unsterile conditions. But those findings can't be used in civil court.

Dr. Stephen James outside the College of Physicians and Surgeons of Ontario, in November 2015. (ANDREW FRANCIS WALLACE / TORONTO STAR) | ORDER THIS PHOTO

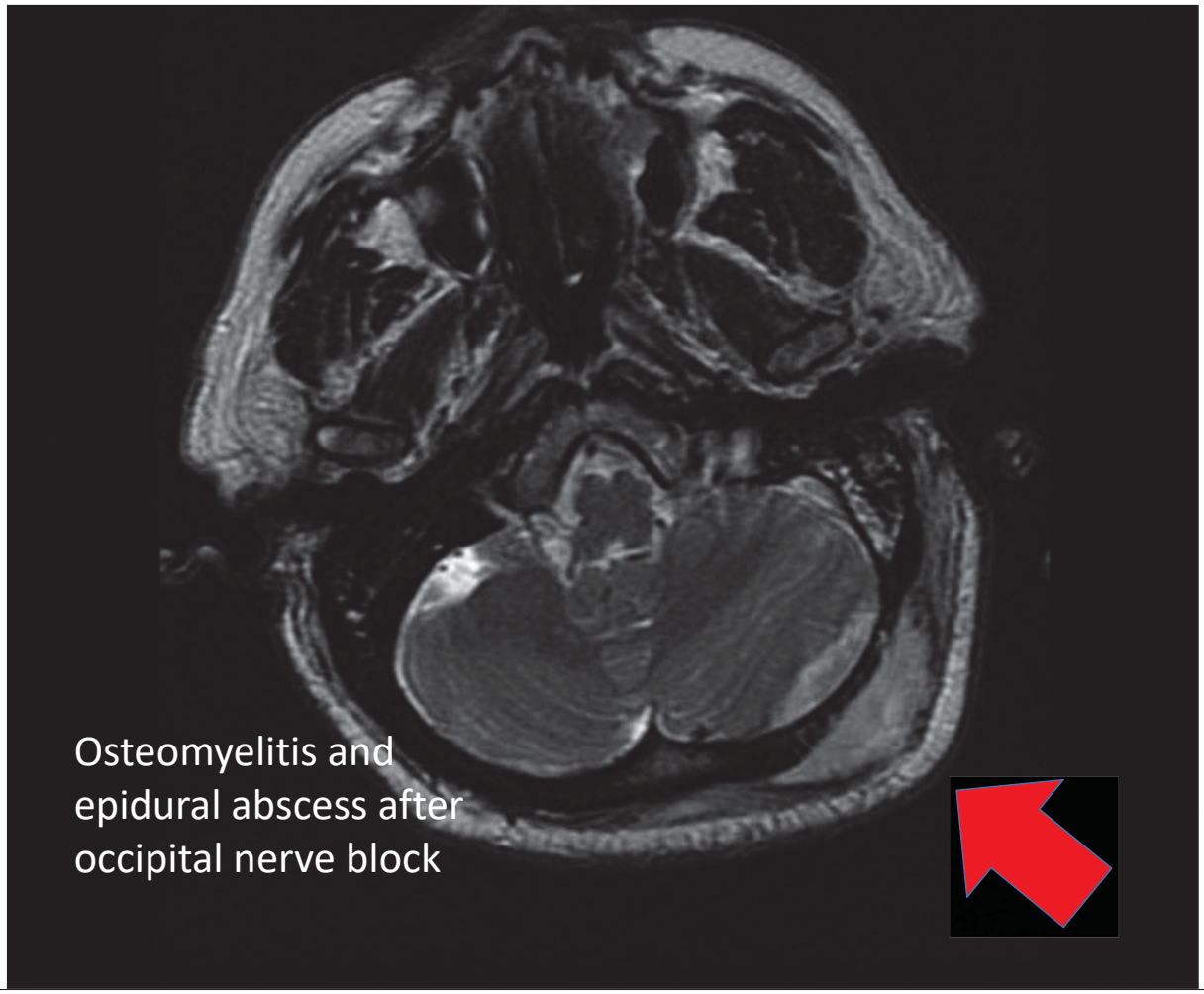


Search keywords:

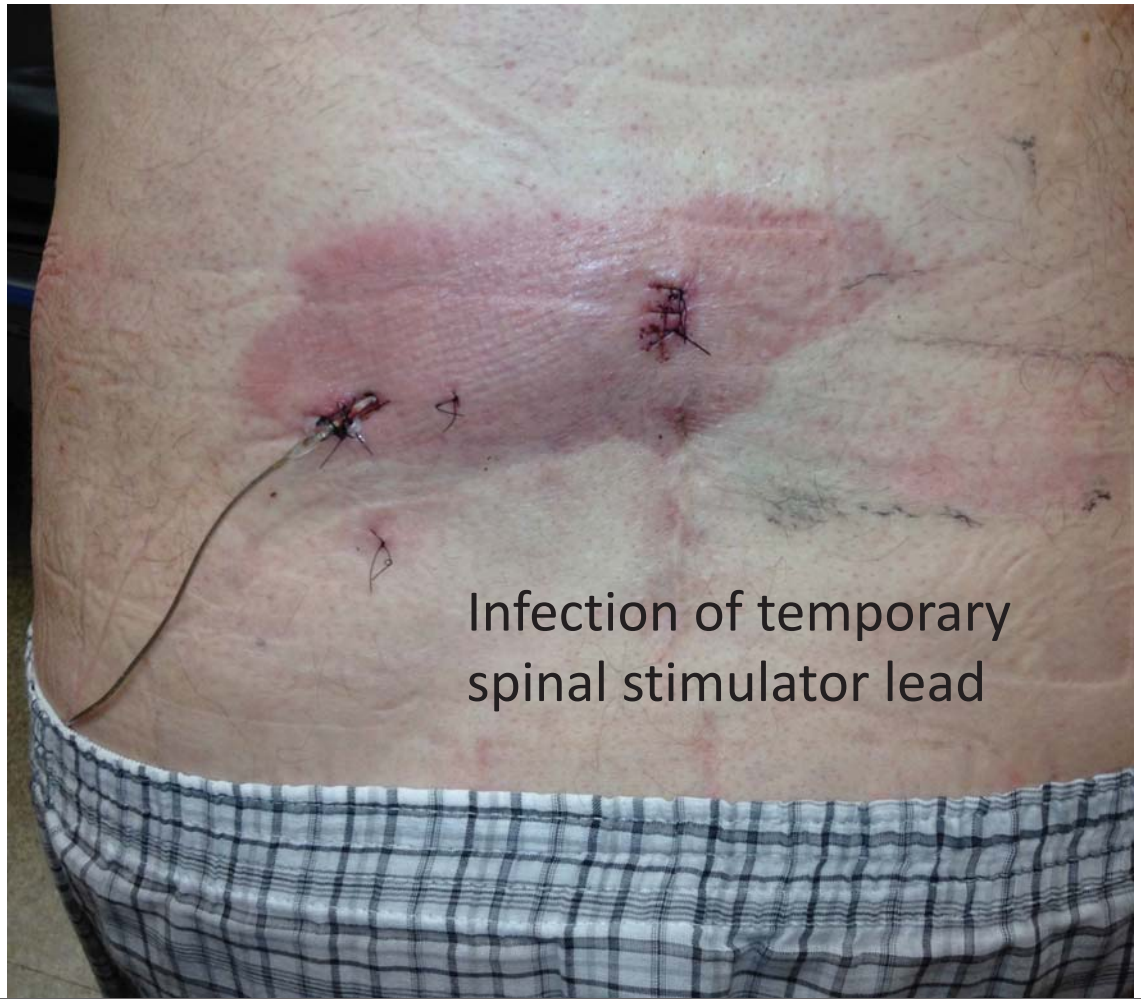
-CPSO-James-infection-pain

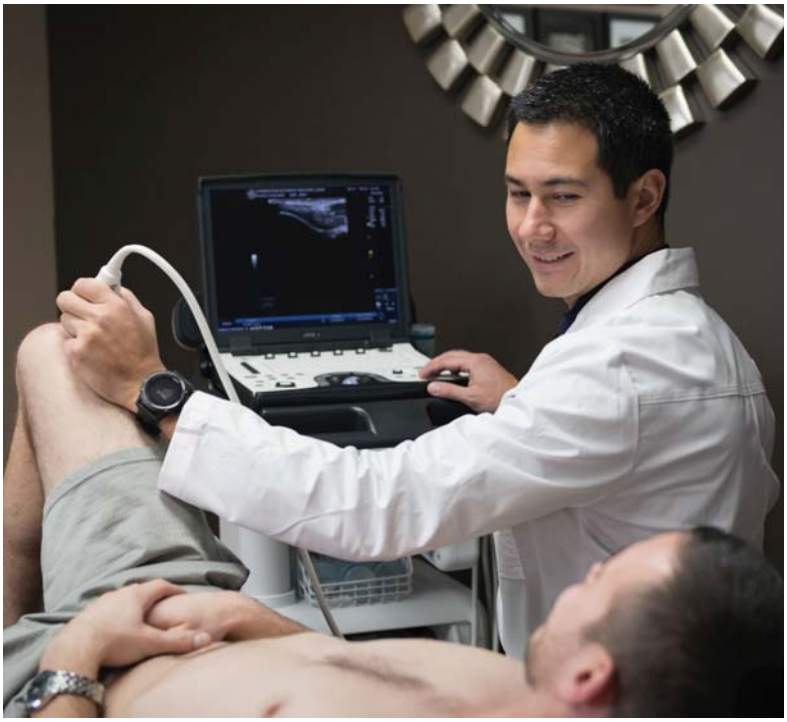
-Toronto.ca—

previous IPAC investigations--Rothbart

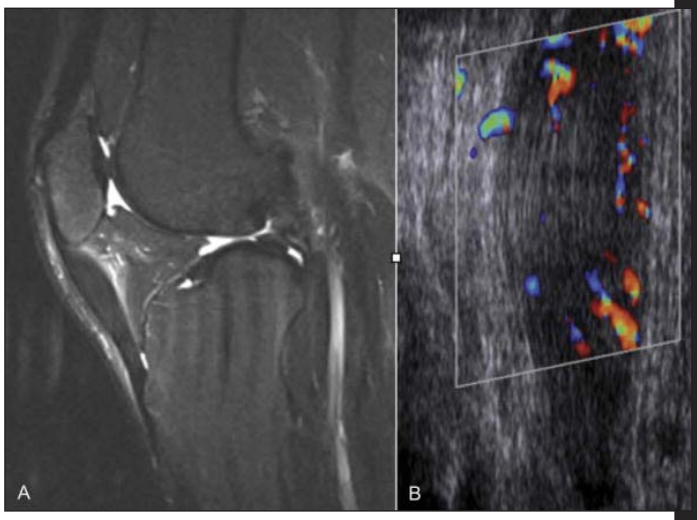


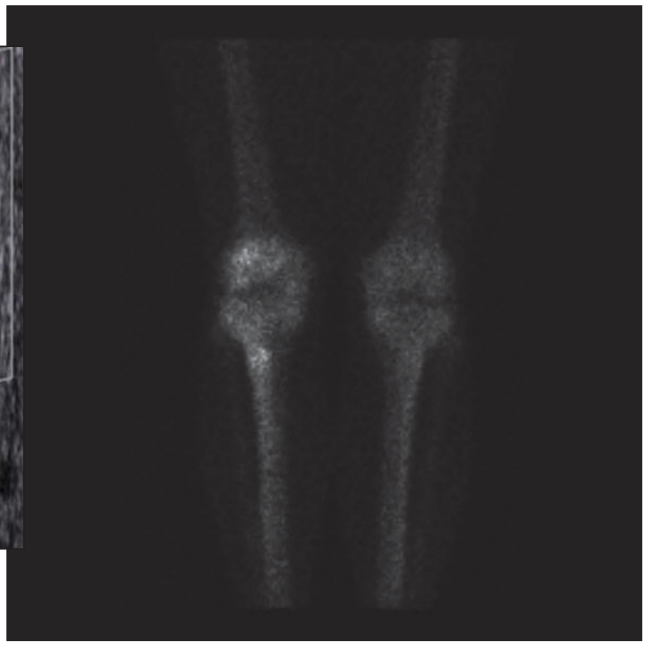
Osteomyelitis and epidural abscess after occipital nerve block





Honeymoon 2021: regenerative medicine has no risks…..

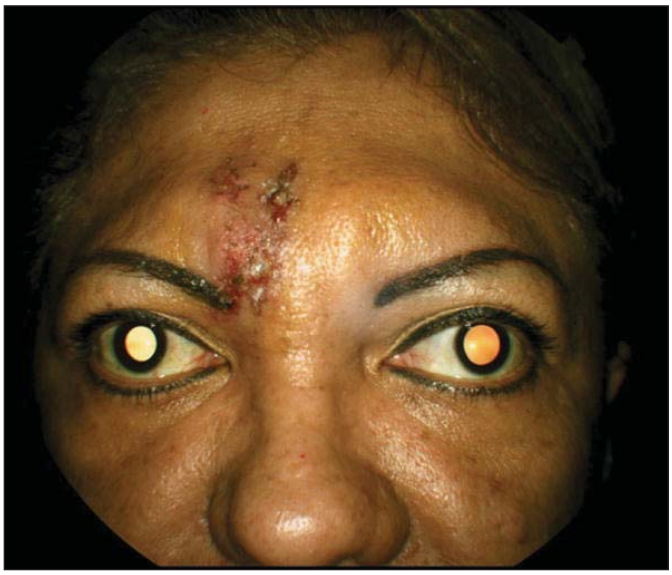




Exuberant Inflammatory Reaction as a Side Effect of Platelet-Rich Plasma Injection in Treating One Case of Tendinopathy.
Kaux, Jean-Francois; Croisier, Jean-Louis; PT, PhD; Leonard, Philippe; Le Goff, Caroline; Crielaard, Jean-Michel; MD, PhD

Clinical Journal of Sport Medicine. 24(2):150-152, March 2014.
DOI: 10.1097/JSM.0b013e31829aa410

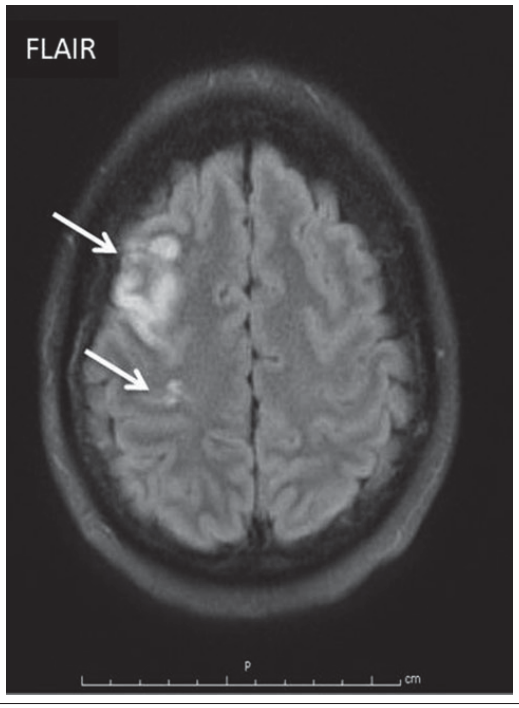
Injection of PRP produces 3 months of increased pain and inflammation.
-no cultures taken, Rx Rifampin/Minocycline x3/12,
-treated as CRPS. Sx return to baseline



Irreversible Blindness Following Periocular Autologous Platelet-Rich Plasma Skin Rejuvenation Treatment.
Kalyam, Krishnapriya; Kavoussi, Shaheen; Ehrlich, Michael; Teng, Christopher; Chadha, Nisha; Khodadadeh, Sarah; Liu, Ji

Ophthalmic Plastic & Reconstructive Surgery. 33(3S) Supplement 1:S12-S16, May/June 2017.
DOI: 10.1097/IOP.0000000000000680

PRP injected for eye wrinkles.
-Develops complete visual loss
-optic nerve and anterior MCA circulation ischemia.



What is your IPAC plan???

- Hand hygiene
- Naked from the elbows down
- Sterile technique
- Can a patient with a complication get hold of you?

resuscitation

Your patient becomes unresponsive, the pulse-ox stops!

H's

- Hypovolemia
- Hypoxia
- Hydrogen ions (acidosis)
- Hyperkalemia
- Hypokalemia
- Hypothermia
- (hypoglycemia)

T's

- Toxins
- Tamponade
- Tension pneumothorax
- Thrombosis--coronary
- Thrombosis—pulmonary
- Trauma

Your usual outpatient for an intervention becomes unresponsive, the pulse-ox stops!

- **T**otal spinal—If neuraxial/facet/foraminal
- **T**oxicity: too much fentanyl/midazolam
- **T**oxicity: LAST
- (toxicity: anaphylaxis, hypoglycemics)
- **T**ension pneumothorax--if foraminal /paravertebral above L1

ABC's:

- Prone patient—roll over or not?
- Call for help—Code team, 911
- Where is the crash cart?
- BVM 100% 02, check pulse, start compressions
- IV fluid (you started an iv, right???)
- Epi (remember low dose if LAST)

…rmed by _____ and those whom he/she may desi

…ent has been explained to me by Dr Bennie
…erstand, including:

…atment involves (what will be done & what will happen);
…ions or choices are;
…tment is intended to help my condition; and
…, foreseeable risks or potential serious consequences of the treatment,
…lude:
pain, swelling, bruising, infection
and / or nerve damage.
SPINAL CORD INJURY

…l to me that during the course of the proposed treatment, unforeseen conditions may b…
…e other treatment in addition to or different from the treatment discussed. I also conse…
…on, treatment or operative procedure as Dr Bennie de…

…to me that in the course of my treatment I may need a transfusion of blood compone…
…ernatives to the use of blood components and/or blood products have also been dis…
…nd understand the benefits and risks associated with transfusion. I understand tha…
…d components and blood products have been tested. I have been given informatio…

_____ and those whom he/she may designate as a…

…ed to me by Dr Bennie

…t will be done & what will happen);

…help my condition; and
…potential serious consequences of the treatment,
pain, swelling, bruising, infection
and / or nerve damage.
STROKE
DEATH
PARALYSIS

…course of the proposed treatment, unforeseen conditions may be revealed
…dition to or different from the treatment discussed. I also consent to such
…ive procedure as Dr Bennie deems immed…

…e of my treatment I may need a trans…

CMPA four pillars:

- ***Indication***
- **Discussion and *consent***
- **Competent *performance* of procedure**
- **Good *documentation***

"…even if a risk is 'a mere possibility' yet carries with it serious consequences such as paralysis or death, it should be regarded as **material** and therefore requires disclosure (CMPA website)

Qualification for malpractice:

- Procedure not indicated
- Alternatives not explained, true informed consent lacking
- Conduct of procedure not up to a standard e.g. fluoroscopy
- Complication not recognized, managed (includes unavailable for emergencies)

PAIN MEDICINE
Volume 9 · Number S1 · 2008

Complications of Spinal Diagnostic and Treatment Procedures

Nikolai Bogduk, MD, PhD, DSc,* Paul Dreyfuss, MD,† Ray Baker, MD,‡ Way Yin, MD,‡ Milton Landers, DO, PhD,§ Michael Hammer, MD,¶ and Charles Aprill, MD**

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ABSTRACT

Background. Spinal intervention procedures are widely practiced. Complications are sometimes described in case reports, but the full spectrum of possible complications has not been comprehensively publicized. The fact that certain complications continue to occur suggests that practitioners may not be fully aware of the nature of possible complications and how to recognize warning signs.

Objectives. To highlight the nature of potential complications of spine interventions and to assist practitioners in recognizing warning signs of impending complications so that they might be prevented.

'There are no complications of procedure 'x'
when it has been performed correctly…' (Nikolai Bogduk)

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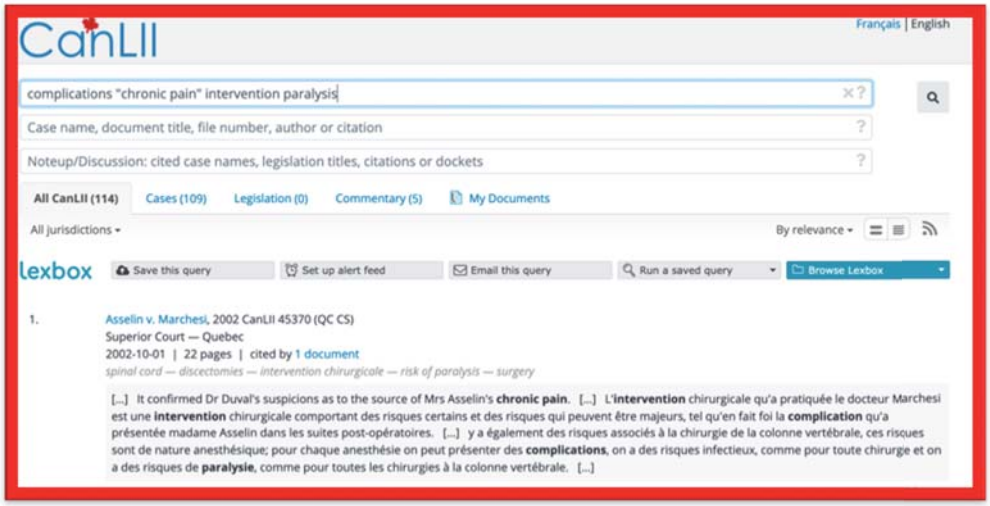

Objectives: summary

- Misplaced needles can kill: are you using imaging and contrast?
- Particulate steroids can cause embolic effects
- Infection control is everyone's business.
- Our typical demographic is at higher risk for epidural hematoma.
- Consent is a process. **Document** specific risks.