Съезд Congress

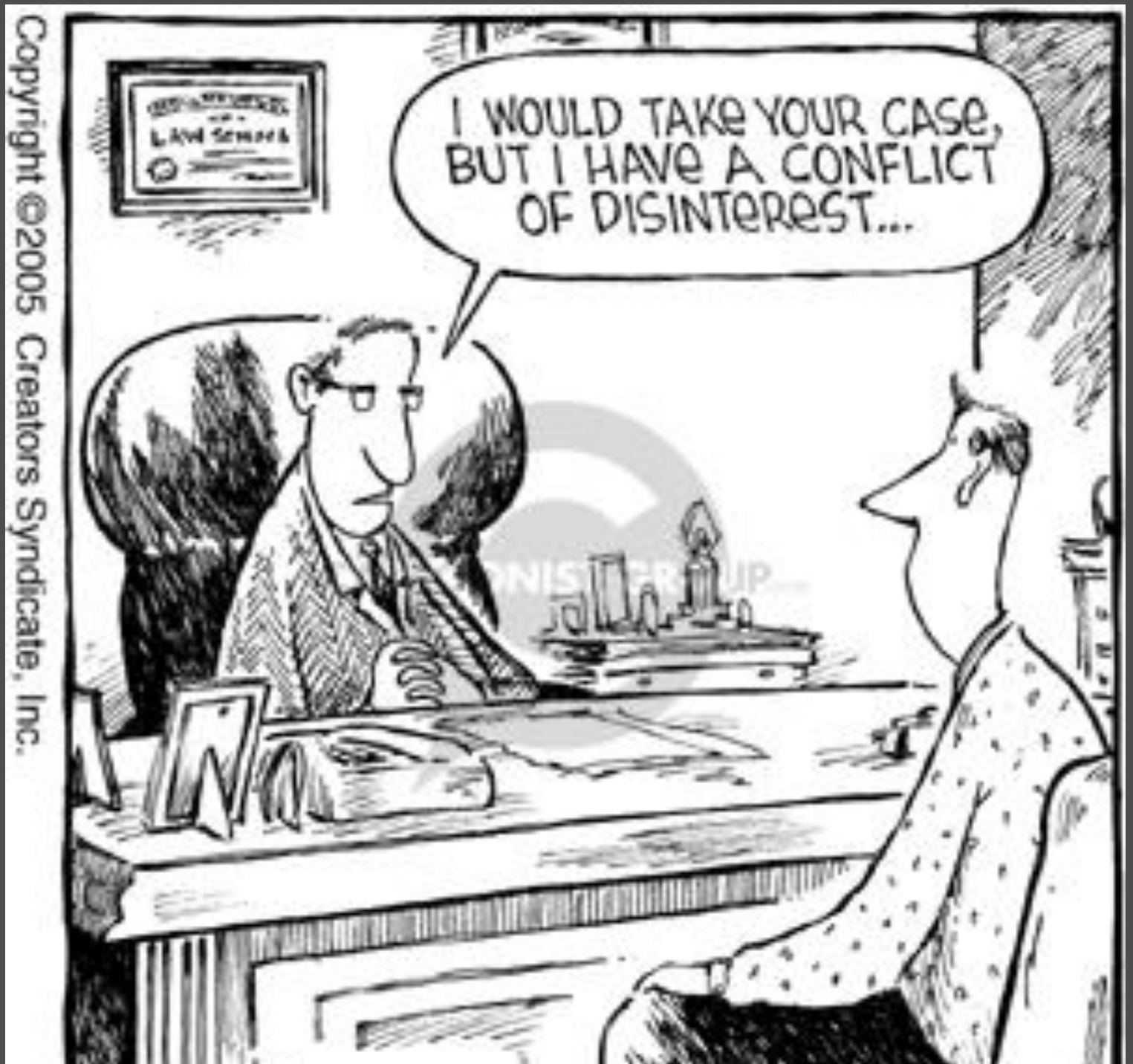
5-7 сентября 2018 / Санкт-Петербург
September 5-7, 2018 / St. Petersburg

MARCEL VERCAUTEREN

NEUROLOGICAL COMPLICATIONS AFTER CNB : *are parturients different ?*

Peter (P. Rubens)

Peter (the Great)


I WOULD TAKE YOUR CASE, BUT I HAVE A CONFLICT OF DISINTEREST...
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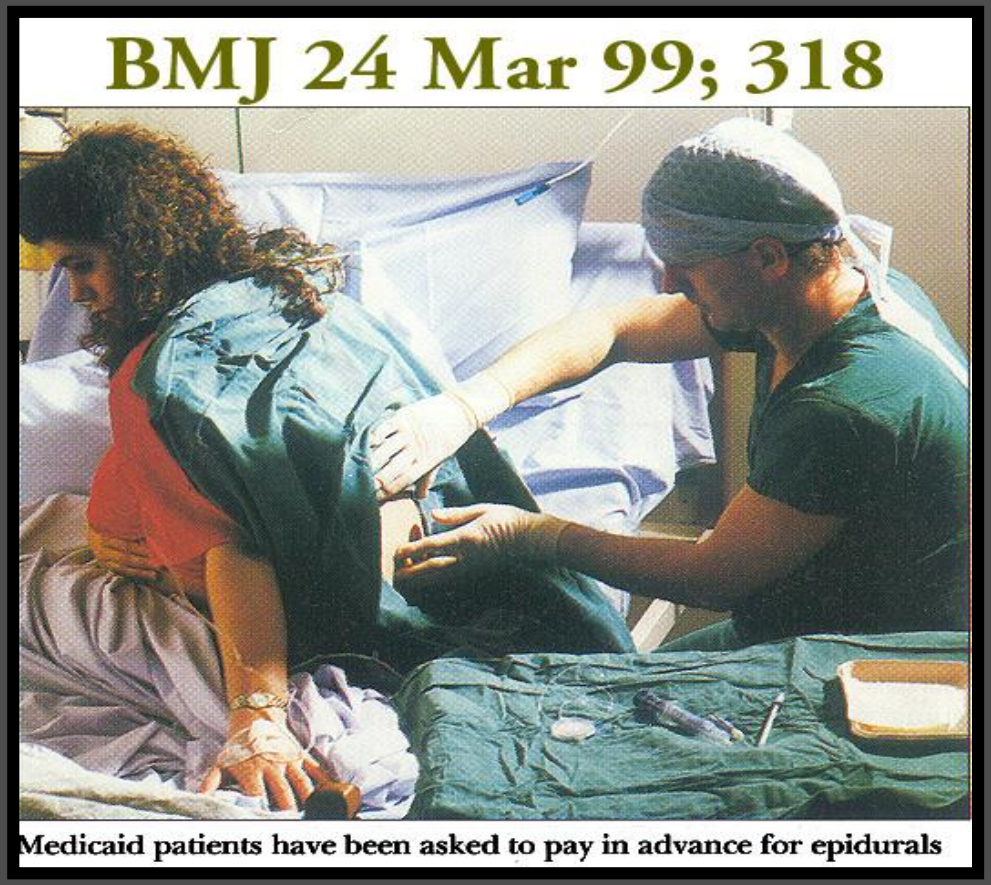
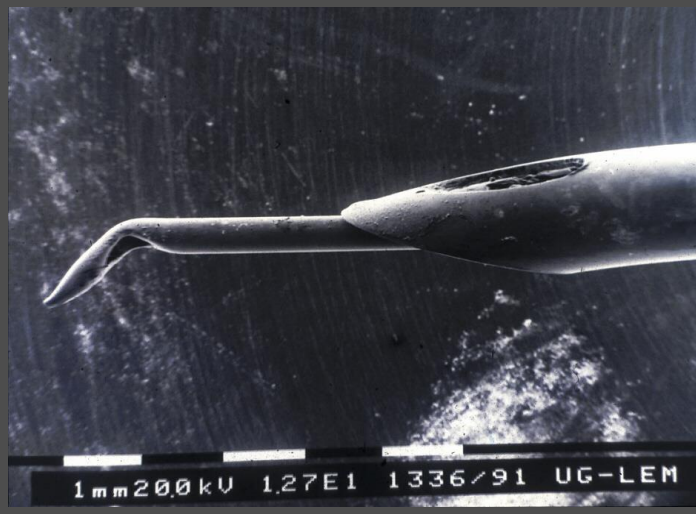
What may be particularly specific for parturients ?

- Haematoma ?
- Abscedation
- Related to
  - 'Urgency'
  - CSE ?
  - Age ?
  - Anatomy ?
    - *Lordosis, elasticity, taps…. ?*

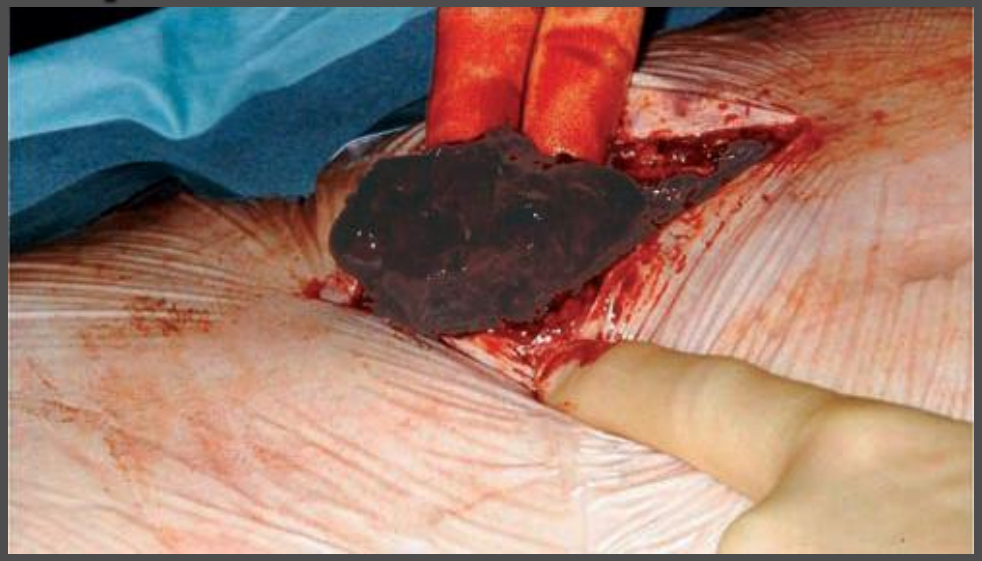


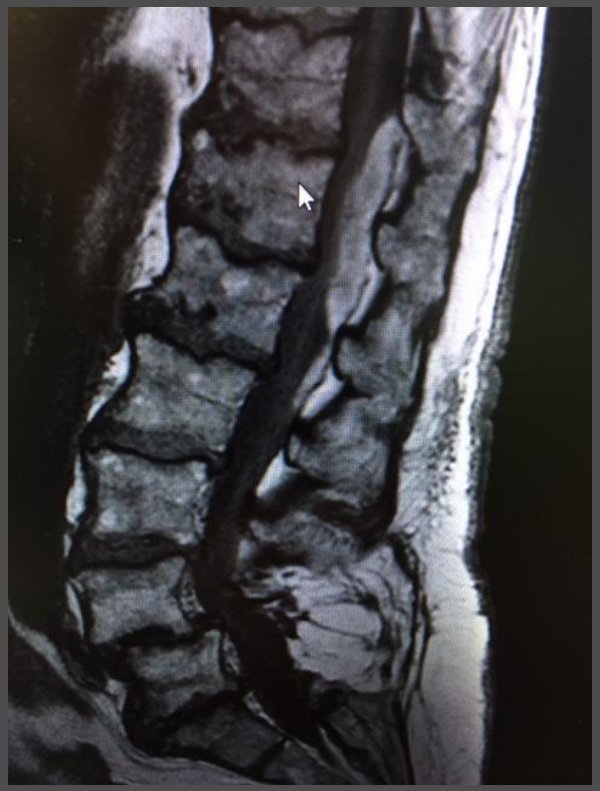
What will not be discussed

- Injection of 'wrong' substrance
- LA induced CES or TNS
  - Lidocaine ?
- Broken, twisted catheters
- Inappropriate equipment
- Systemic toxicity
- Pre-existing (known) neurological disease
- Previous back surgery



Spinal haematoma





'When a spinal haematoma is suspected it must be treated as a limb- / life-threatening emergency'

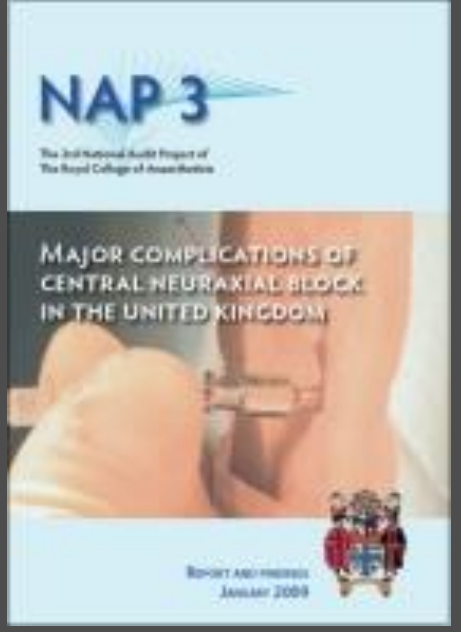
Cook TM, Counsell D, Wildsmith JA
BJA 2009; 102: 179-90

*www.rcoa.ac.uk/system/files/CSQ-**NAP3**-Full_1.pdf ·*
Chapter 7 : Haematoma

What is the 'real' incidence ?

	Epidural	Spinal	Obstetric
Horlocker 2001	1/150.000	1/220.000	
Moen 2004			1/200.000
Ruppen 2006 (27 articles)			1/168.000
Castillo 2007	1/143.000	1/166.000	
Volk 2012	1/6628		
Pitkanen 2013	1/16.400 =CSE : 1/17.800	1/775.000	
NAP 3	1/14.000	0/360.000	0/300.000
Rosero & Joshi 2016	1/6000		1/160.000

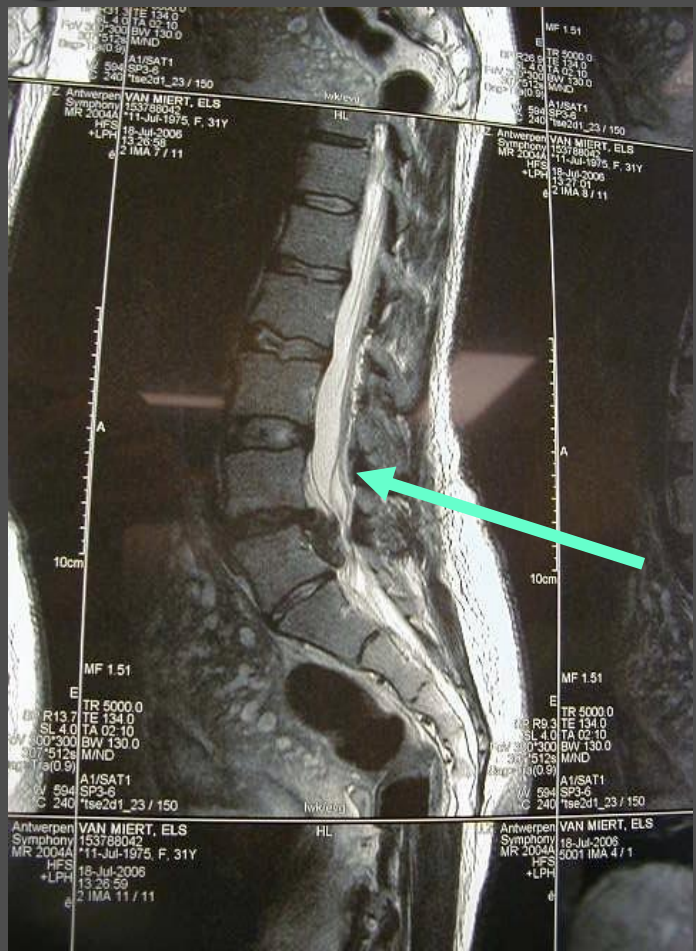
NAP 3 : Haematoma



- N=8 (only 1 full recovery)
  - 7 : drugs interfering with coagulation
  - 7: >70yrs 5: thoracic 3-4 : removal ?
  - 4 delayed diagnosis : reasons
    - *Unilateral symptoms*
    - *Epidural for postoperative analgesia*
    - *Some recovery after pump stop*
    - *Night/WE : symptoms unrecognized, junior staff, …*
    - *MRI not available in hospital or out of hours*
  - not related to difficult, traumatic, trainee punctures
  - Sensory / motor block, micturition…but back pain is rare

Pregnancy/delivery

- Mostly young (?), hypercoagulable but….
  - ! *larger vessels*
  - ! *SA-space compressed*
  - ! *At risk for Herniated Disc*
    - # posture change, elasticity?
    - > 10 reported cases of **CES**
      - haematoma = catastrophy



Brown & Levi, Spine 2001 (n=3)
Elgamri et al, J Radiol 2009 (n=3)

Case 1 (2010)

- C-section, 28yr, CSE (2 level) BH 7.5mg, 8am
- Uneventful, recovery of the block
- Start PCEA : LevoB 0.1% + Suf (4ml/15')
- POD1, 9am : consult anaesthesia (use 52mL)
  - MB both legs, sensory block T12
  - *Advise : pump stop (pt did not ask bolus since 3am)*
  - 3pm : 2nd call to anaesthesia, no change
  - CT 3.30 : negative , catheter out, no LMWH
  - 8.30pm : no change, consult neurology (R/: CCB)

- **POD2 : Friday !!**
  - MRI 9am (ordered by anaesthesia): ***Negative !***
  - Phonecall to Marc Van de Velde (Univ Hospital)
    - EMG, SSEP & control after the weekend
  - Anaesthetist insists on transfer to UH !
  - At arrival :
    - check (same) MRI: haematoma !
    - CT : intradural catheter position ?
  - Urgent surgery L2-L5
    - intradural haematoma, above L2 clean (sensory T12?)
  - Poor recovery, cauda equina, incontinence
  - Implantation sphinter, neuropathic pain….

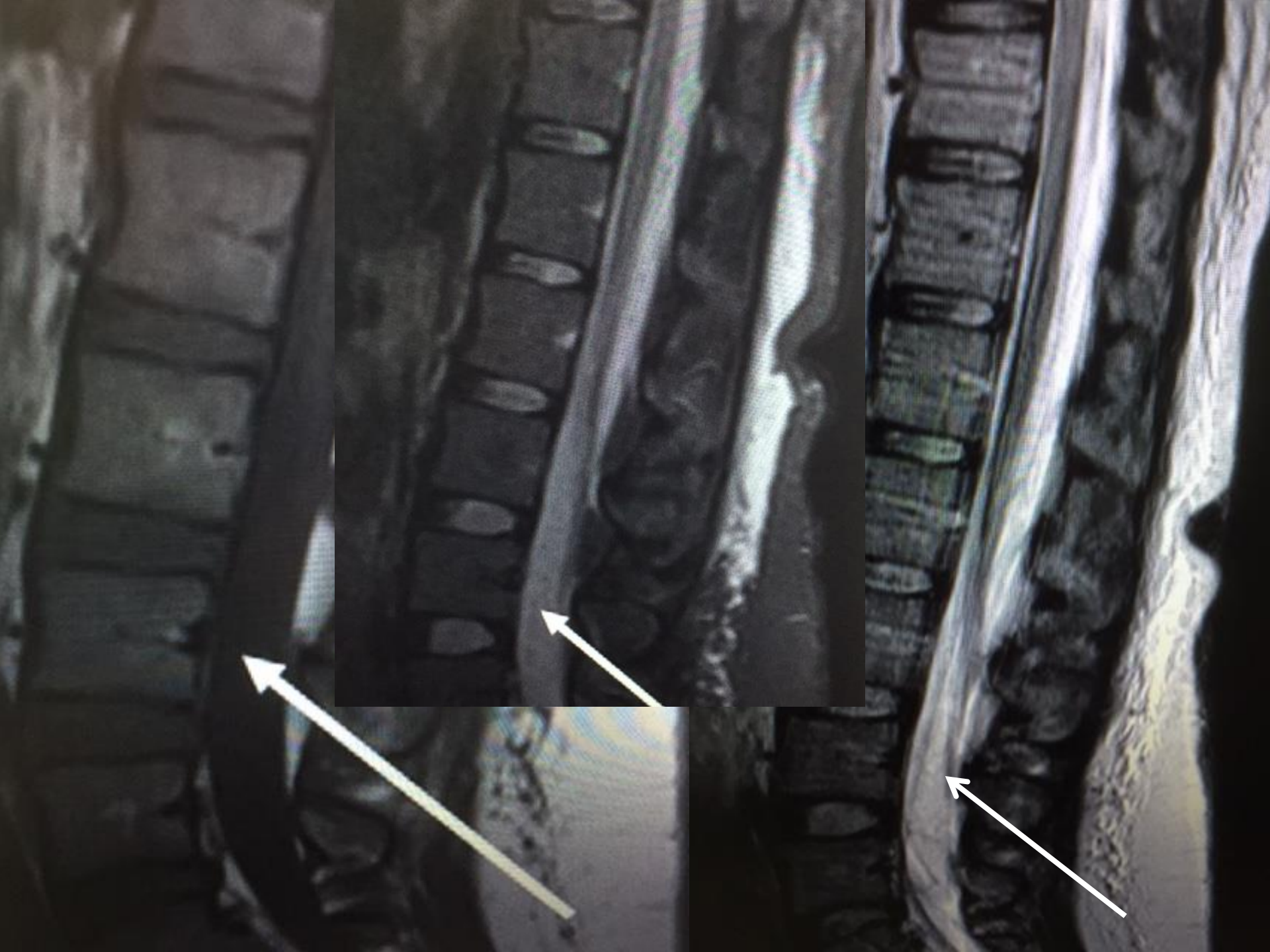
Acute intrathecal haematoma following neuraxial anaesthesia: diagnostic delay after apparently normal radiological imaging

M.A. Walters,[a] M. Van de Velde,[a] G. Wilms[b]
[a] *Department of Anaesthesia,* [b] *Department of Radiology, University Hospital Gasthuisberg, Leuven, Belgium*

ABSTRACT
We describe a case of intrathecal haematoma following combined spinal-epidural anaesthesia for caesarean section. The parturient was previously well with no risk factors for haematoma development. Surgical intervention was delayed, resulting in permanent neurological injury. Incorrect interpretation of clinical findings and magnetic resonance imaging contributed to the delay in definitive treatment. We discuss the difficulties in diagnosis, image interpretation and the need for a specialist opinion when abnormal neurological symptoms persist despite apparently normal imaging.

Keywords: Intrathecal haematoma; Neuraxial anaesthesia; Combined spinal-epidural anaesthesia; Magnetic resonance imaging

Walters et al, Int J Obstet Anesth 2012



The good

- Anaesthetist
  - Asks advise to UH
  - takes action before WE
- Psychological support
- MRI : first patient

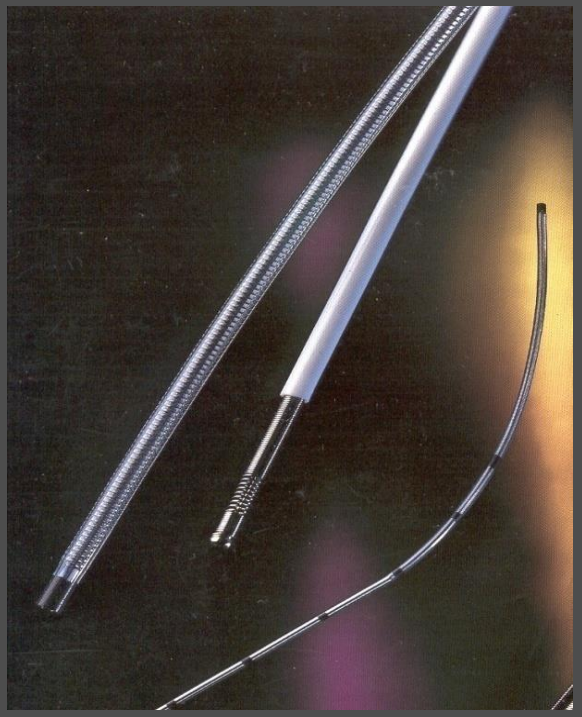
The bad

- MRI : ‘next morning’
- MRI & CT : misjudged ?
- Case published
- Neurologist : useless
  - CCB ?
  - suggests MRI
    - but no action
- Anaesthesia notes ?

zaten nu 5 uur tussen, wat kan een mens zich nog meer dromen. De voorbije nacht heeft mijn schatje haar benen zwaarder voelen worden. Pff, blijkbaar een ambetant gevoel. Rond half tien is dr. Valcke eens komen kijken, en heeft wat oppervlakkige ethertests gedaan. Mijn schatje besluit de pijnpomp niet meer te gebruiken, omdat ze morgen al van plan zijn om eens recht te staan, en omdat er anders een verdoofd slapend gevoel naar de benen wordt gestuurd. 11.15u: De pijn wordt erger (wat normaal is als de pijnpomp wegvalt), maar in plaats dat de tintelingen in de benen zouden weggaan, verergeren ze nog. Ik heb compassie met haar, wou dat ik iets kon doen of de pijn wat overnemen, maar ik troost me met de gedachte dat we binnen een dag of 5 naar huis kunnen. 13u: Ik ga efkes rap om en weer naar huis om het voorschot van de babyborrel te betalen, en nog wa extra handdoeken en washandjes, en eindelijk mag ik ons zelfgemaakt geboorte-verkeersbord buitenzetten. 16.20u: De anesthesist komt terug eens kijken en doet opnieuw enkele oppervlakkige tests met ether om te kijken tot waar de ongevoeligheid zit. Voor alle zekerheid wil hij toch foto's laten nemen, en daarna de pijnpomp verwijderen. 20.15u: Bezoek van dr. Vermeulen (een andere anesthesist) en een neuroloog. Maar na de uitleg gedaan te hebben en de foto's te hebben bekeken, komen ze tot het besluit dat er misschien teveel de pijnpomp werd gebruikt, en misschien er zich wa verdovingsgerief had opgehoopt... Morgenvroeg gingen ze zien wat de nacht zal hebben gebracht. Loeka heeft geen zin om te slapen, ze wil om het 1,5 uur aan de borst, wat het ook allemaal niet gemakkelijker op maakt. 23.30u: Er worden 2 machines binnengereden: enerzijds een machine dat er constant voor zal zorgen dat er een betere bloeddoorstroming is, en een andere machine dat automatisch om het kwartier de bloeddruk meet, wat gepaard gaat met een hels lawaai: van slapen zal er niet veel meer in huis komen vannacht.

(11/6) 2.30u: De automatische bloeddrukmeter wordt uitgeschakeld, en omdat mijnen schat een beetje op haar positieven zou kunnen komen, wordt ons Loeka met de verpleegsters meegenomen, met een tut, volledig tegen onze principes, maar ze

Additional questions



- Is CSE responsible ?
  - *2 needles + cath, 2 interspaces*
- Less risk with 'soft' catheters ?
- LOR and position
  - *Less vessel cannulation with saline than air ?*

YES : *Myhre et al, Anesth Analg 2009*
n=8, Quality score 48%, OR 0.49

NO : *Antibas et al, Cochrane Database Syst Rev 2014*
n=2 , 223pts

- *More risk if puncture in sitting parturient?*

What are the lessons then ?

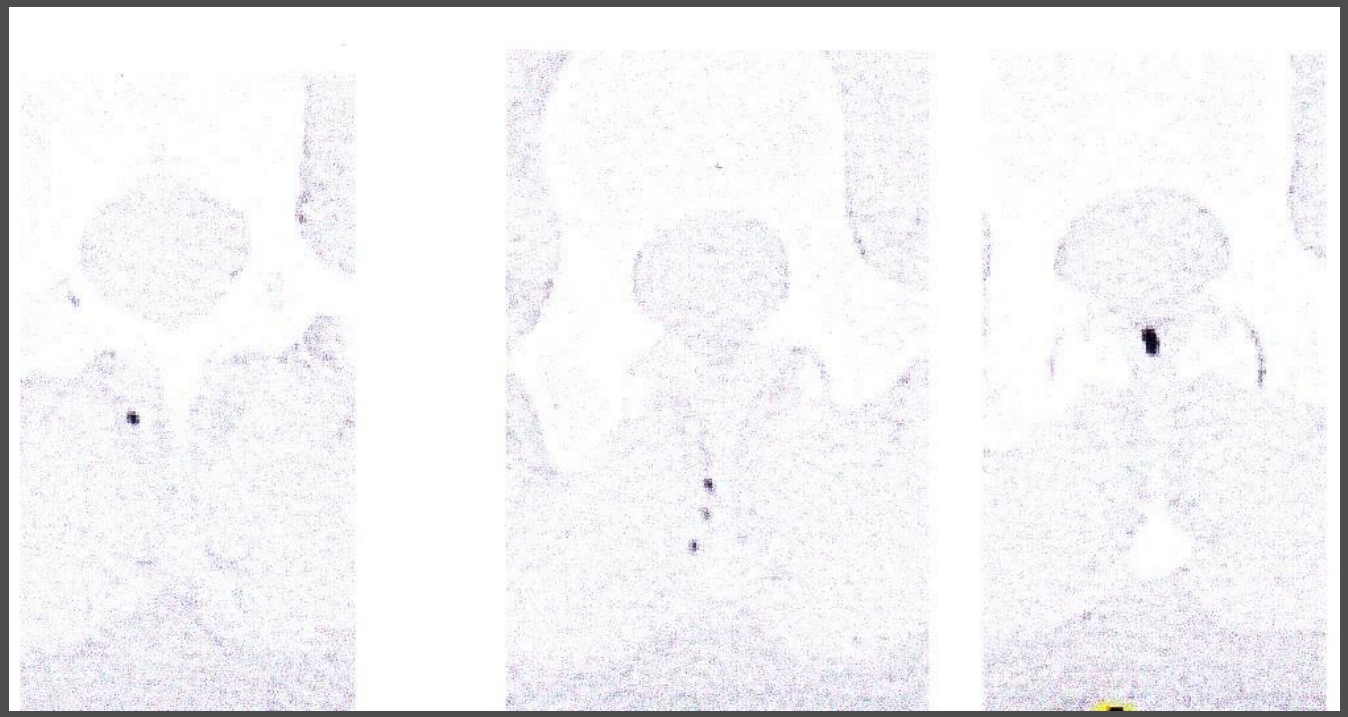
- Removal equally crucial as placement
- Be more precise *(no end of shift !)* in **writing down**
  - *Time of intervention : LMWH, pump stop, catheter removal*
  - *Pump settings and doses consumed*
  - *Time when problems were announced and to whom*
- Consider urgent **MRI** (urgent means 'urgent'!)
  - **Out of hours is no excuse**
- Don't rely on neurologists
- If a haematoma is highly suspected & normal MRI ?
  - *Blind surgical exploration ?*

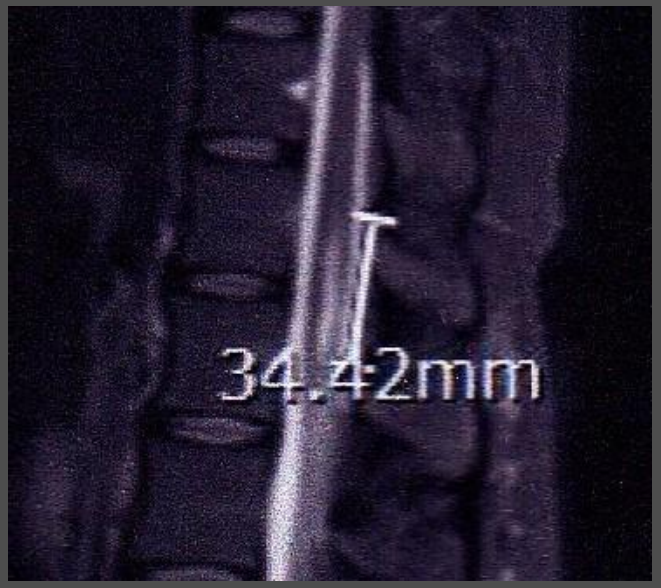
Case 2 (2015)

- C-section, 33yr, CSE (anaesthetist >20yr exp)
- L2-L3 ? :
  - Electric shock on needle entrance, free CSF
  - pain at injection , right leg, 0,2mL
- 2nd attempt, same level : same problem
- Catheter placed and uneventful C-section
- *Postoperatively*
  - Slow recovery of right leg
  - Pain (right leg)

Case 2 (2015)

- MRI planned, next day after catheter removal
- T12-L1: air inclusions (needle trajectory ?)
- Conus : 3.4cm/2mm lesion
- *Evolution*
  - Motor weakness : R leg paresis, drop foot
  - Sensory problems
  - Micturition problems, obstipation
  - Pain (allodynia, hyperesthesia)

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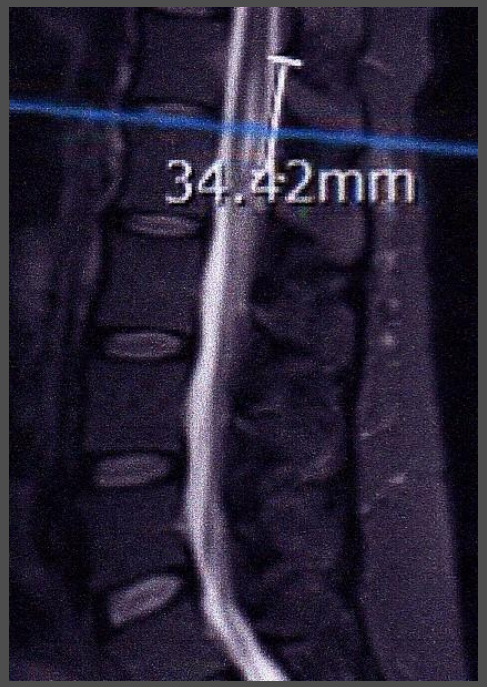
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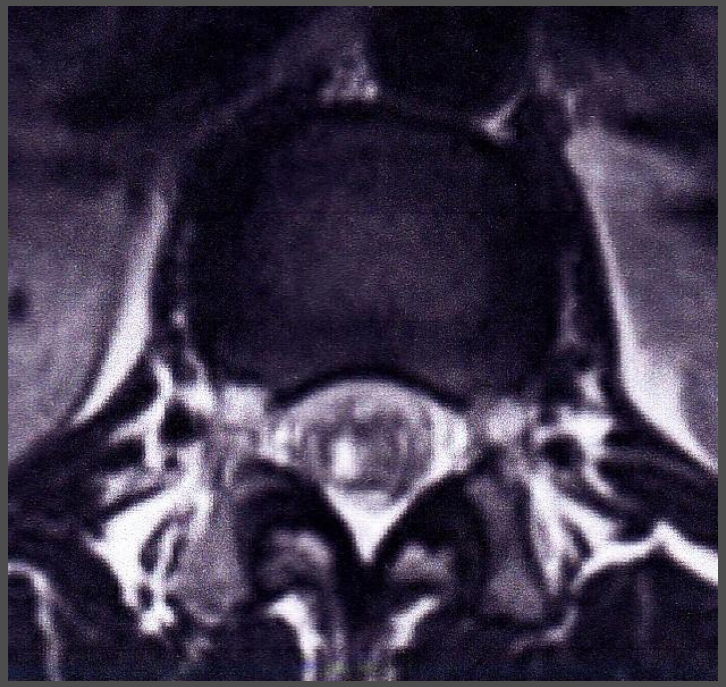


The good

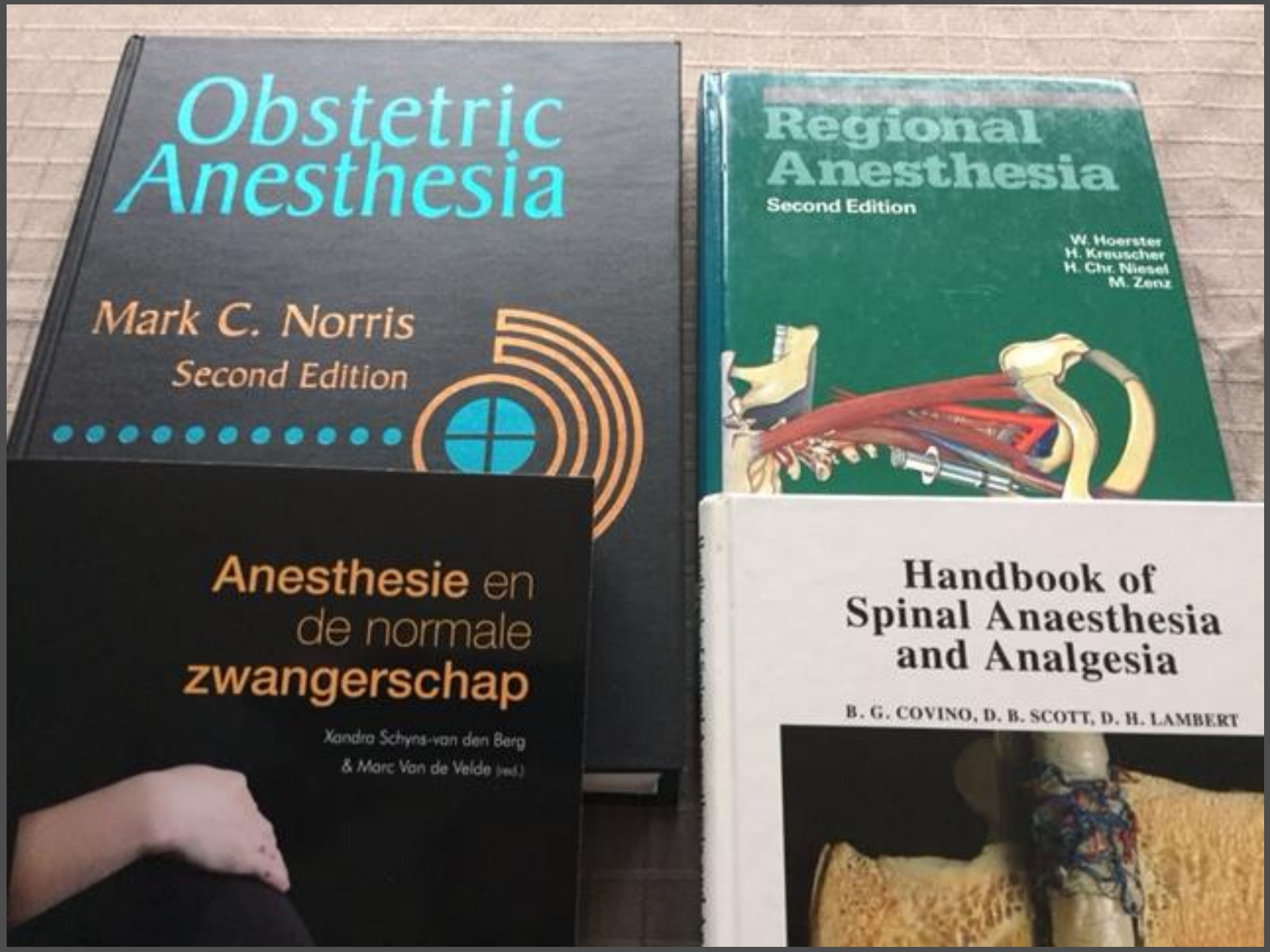
- Anaesthetist
  - Asks for imaging at D1
  - Free CSF flow
  - Stop injection at pain
  - Converts to epidural

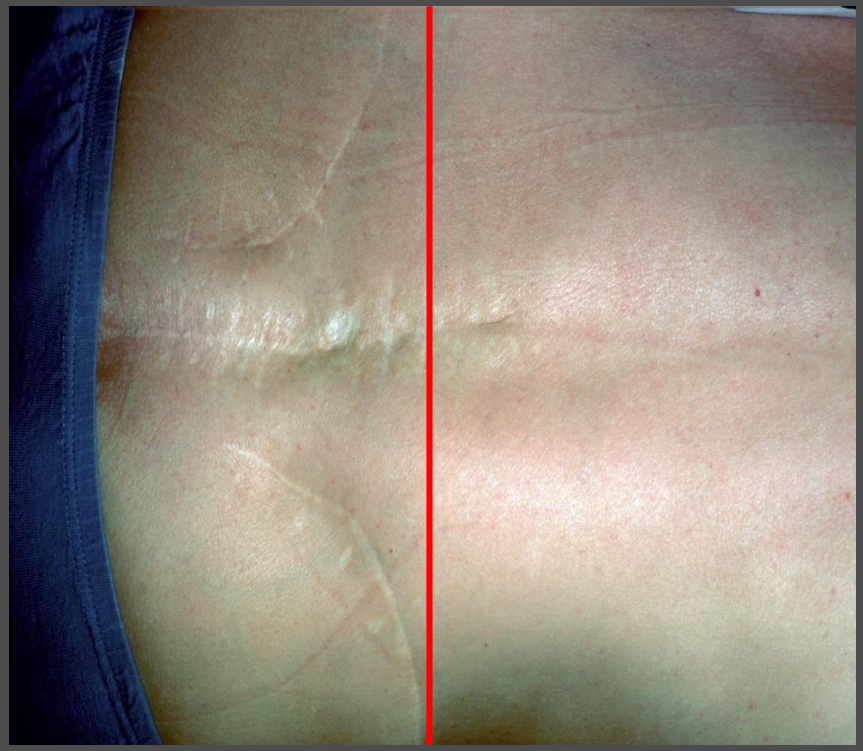
The bad

- Tuffier's line ?
- L2-L3 ?
- No US used
  - To be blamed ?
  - 100% guarantee ?
- Anaesthesia notes
- Patient (MD) in the media

Malpractice claim

- **Questions**
  - **Can we still use L2-L3 ?**
  - **Can one trust Tuffier's line**
    - ***Passing at higher lumbar level in parturient?***
  - **Pregnancy : more at risk for conus lesion**
  - **Is CSE more dangerous than a SDS ?**
  - **Is wrong level a complication or fault ?**
    - ***>50% mistake # 1, even 2 level***
  - **Would US offer 100% accuracy of level ?**

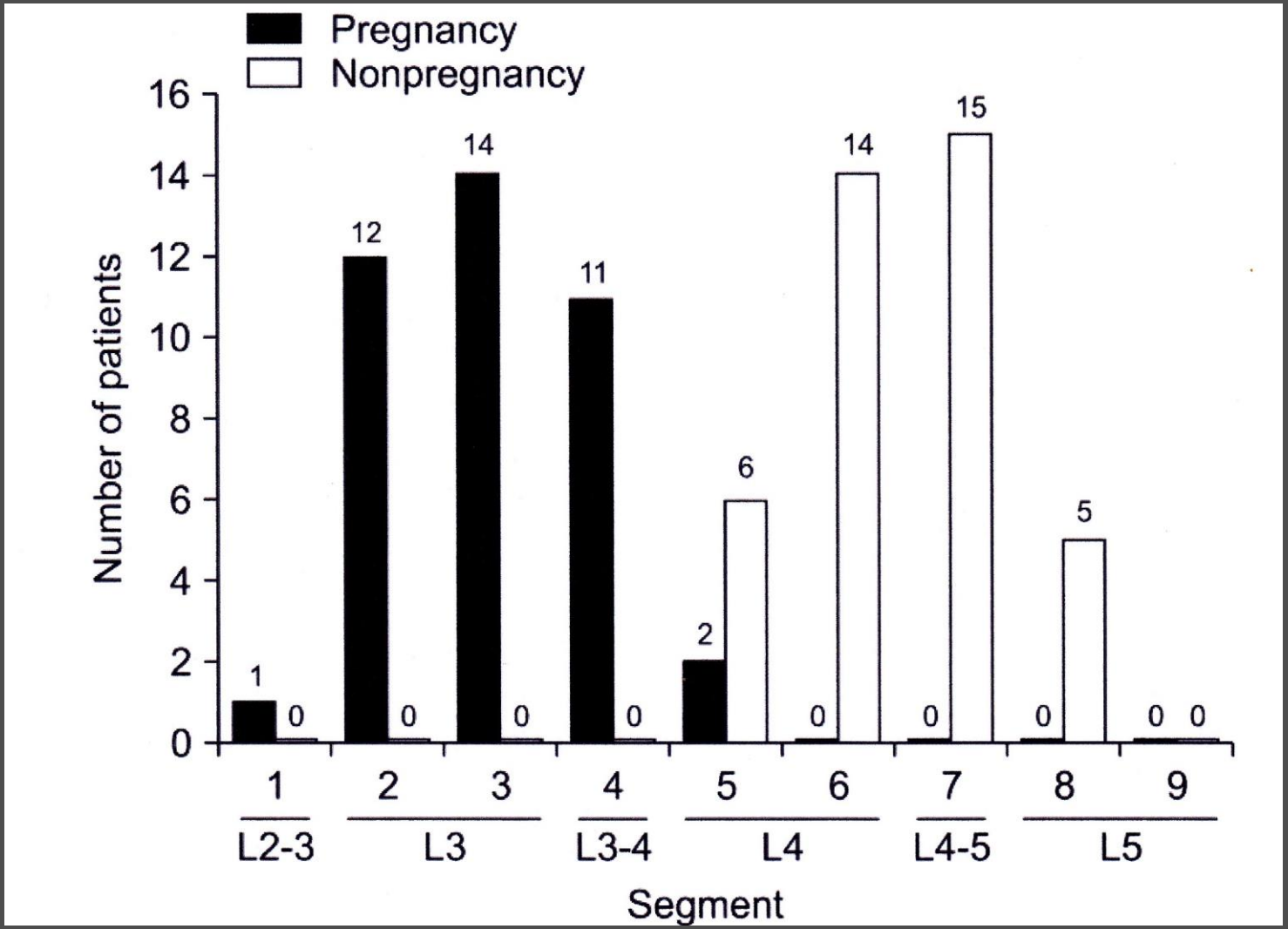

Obstetric Anesthesia
Mark C. Norris
Second Edition
Regional Anesthesia
Second Edition
W. Hoerster
H. Kreuscher
H. Chr. Niesel
M. Zenz
Anesthesie en de normale zwangerschap
Xandra Schyns-van den Berg
& Marc Van de Velde (red.)
Handbook of Spinal Anaesthesia and Analgesia
B. G. COVINO, D. B. SCOTT, D. H. LAMBERT



Truffier's Intercristal line

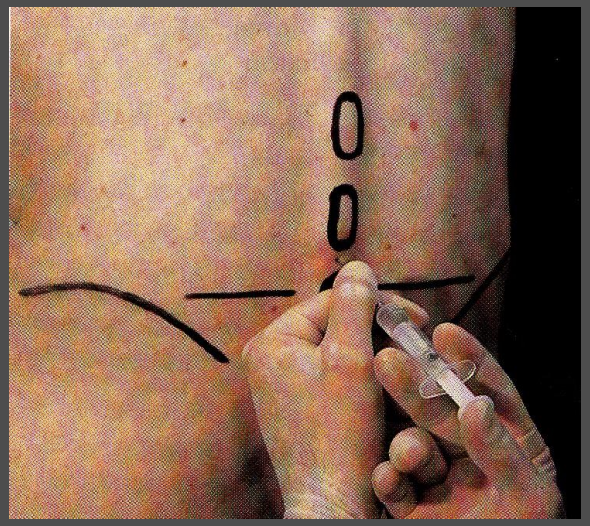
L4-L5 : 14%
L3-L4 : >70%
L2-L3 : 13%

Chakraverty et al, J Anat 2007
Pysyk et al, Can J Anaesth 2010
Margarido et al, Can J Anaesth 2011



Se Hee Kim et al, Korean J Anesthesiol 2014; 67: 181-5

Duniec et al, 2013 : >30% more cephalad



Furness et al, Anaesthesia 2002 :

27% 1 interspace more cephalad or caudad

Obstetric patients :

Schlotterbeck et al, BJA 2008) : **50%** more cephalad, 15% more caudad

Lee et al, 2011 : **25% even 2 interspaces** more cephalad

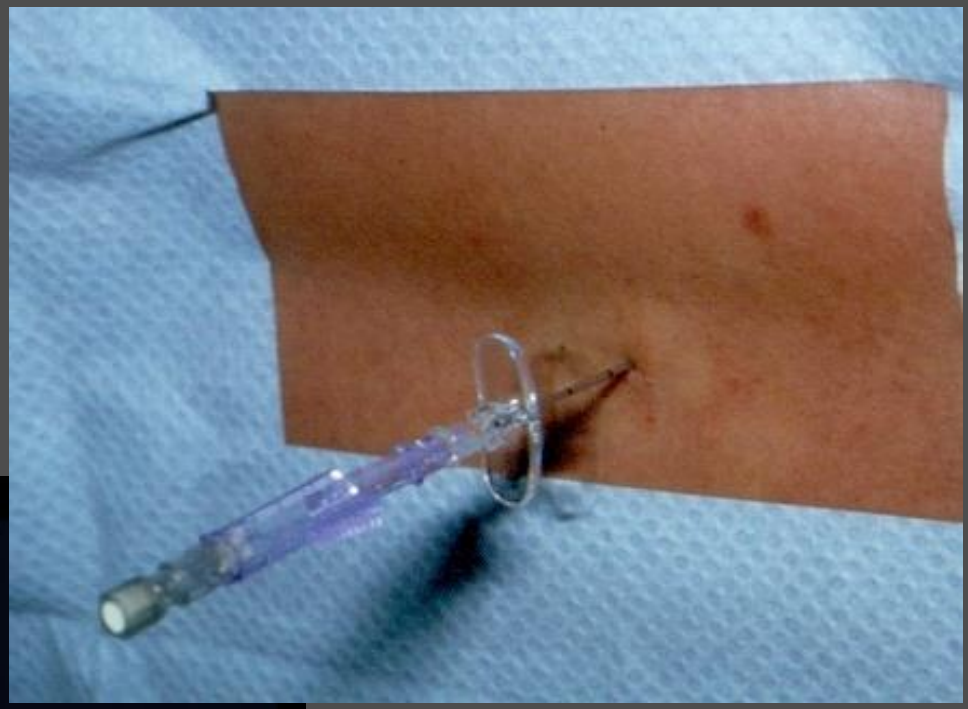
Whitty et al, A&A 2008 : (postpartum) **32% at least 1 interspace** more cephalad

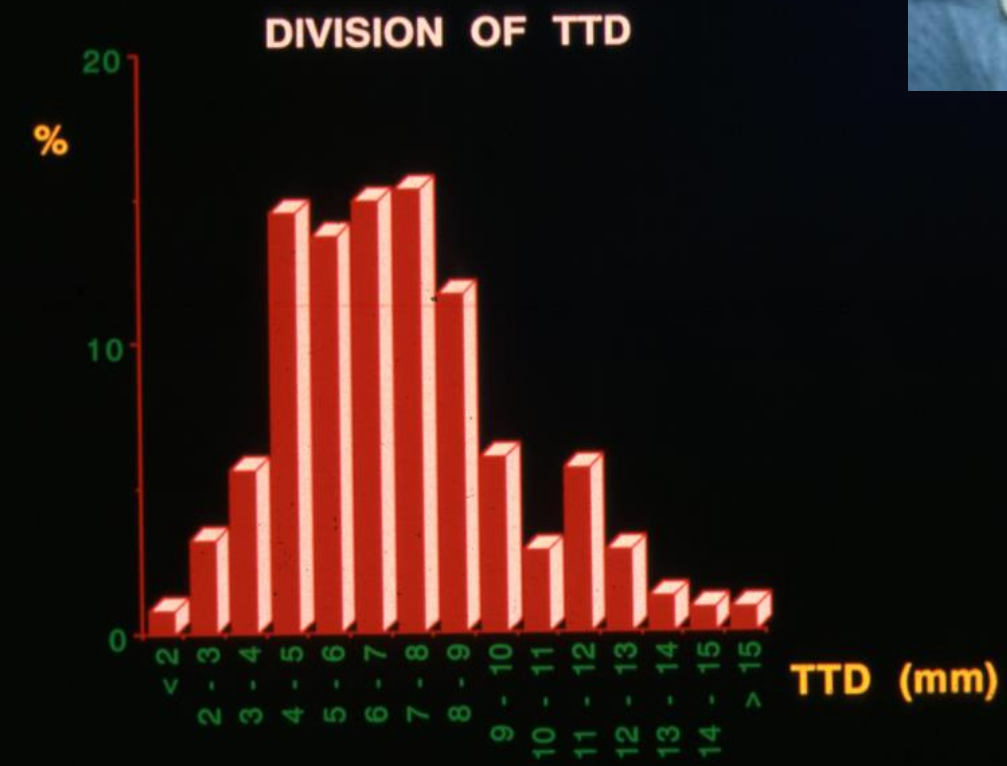
Locks et al, Rev Bras Anestesiol 2010 : **only 50% correct L3-L4** identification.

CSE : side-effects

- **Maternal**
  - Dysphagia
  - Swallowing difficulty
  - Cranial N palsy (V, VII)
  - Meningitis, epidural abscess : >7 cases
    - less asepsis in the labour room ?
  - **Conus medullaris lesion**
    - **n=7 (6 parturients, 4 CSE!)**

Reynolds et al , Anaesthesia 2001; 56: 238-47





TTD : 7.5mm (LOR air)

Pregnancy : +1mm

Hanging drop : -2mm

Anaesthesia 1997; 52: 350-5

BJA 1999; 83: 807-9

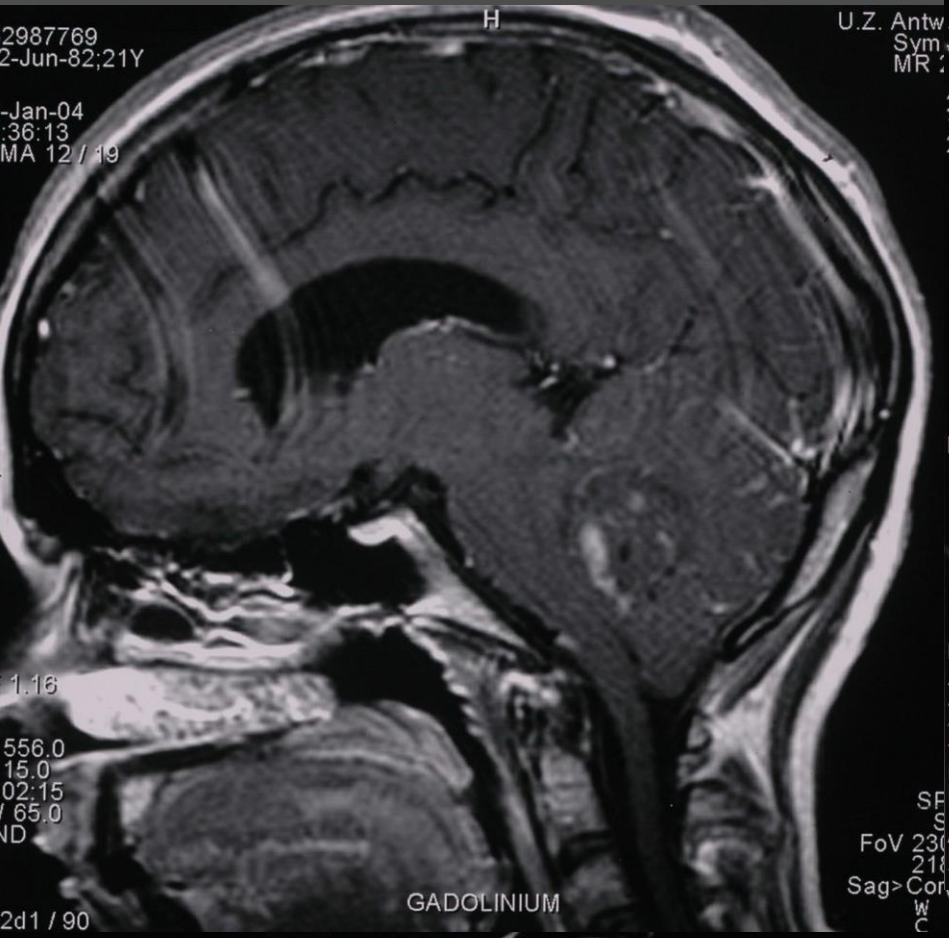
Rom J Anaest Int Care 2017; 24: 1010

Case 3

- **21 yr nulliparous**
- **Uneventful pregnancy**
- **Epidural analgesia, PCEA**
- **<24hrs post-delivery : headache**
  - Headache : fronto-occipital
    - *Position dependent ?*
  - Cervical pain
  - Nausea / vomiting
  - Photophobia
  - Visual / auditive problems

Treatment plan

- Hydration 24h, if not effective : EBP
  - *Day 2 : EBP with 20ml of blood*
    - Sunday, resident
      - slight temporary improvement
  - Day 3 : *Repeat EBP ? CT (SD hematoma ?)*
    - *neurologist: PDPH !*
    - 2nd EBP : 20mL blood
      - No benefit, deterioration !
      - Fundoscopy
      - MRI (6pm)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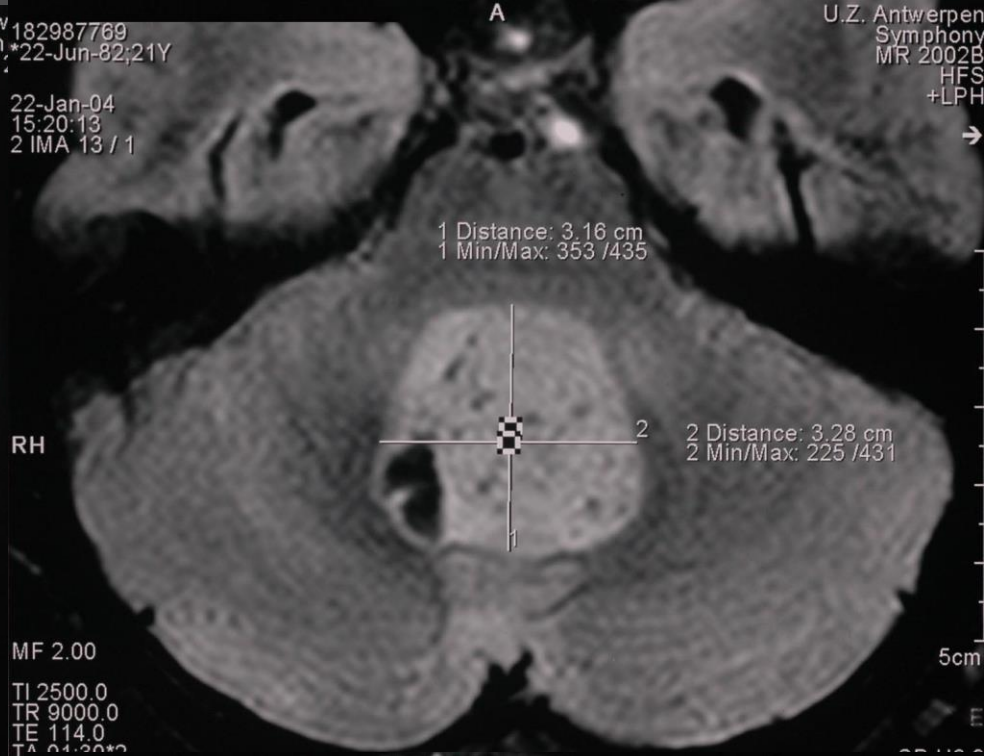
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1 Min/Max: 353 /435
2 Distance: 3.28 cm
2 Min/Max: 225 /431
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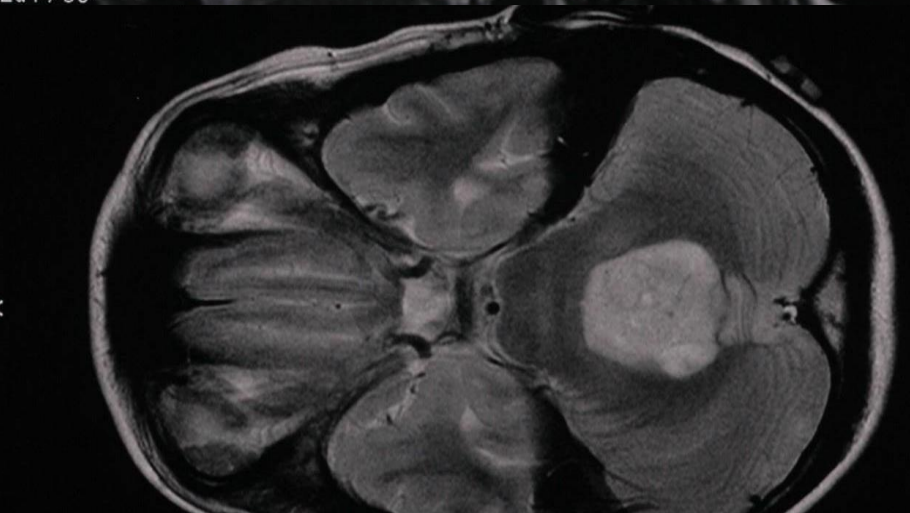
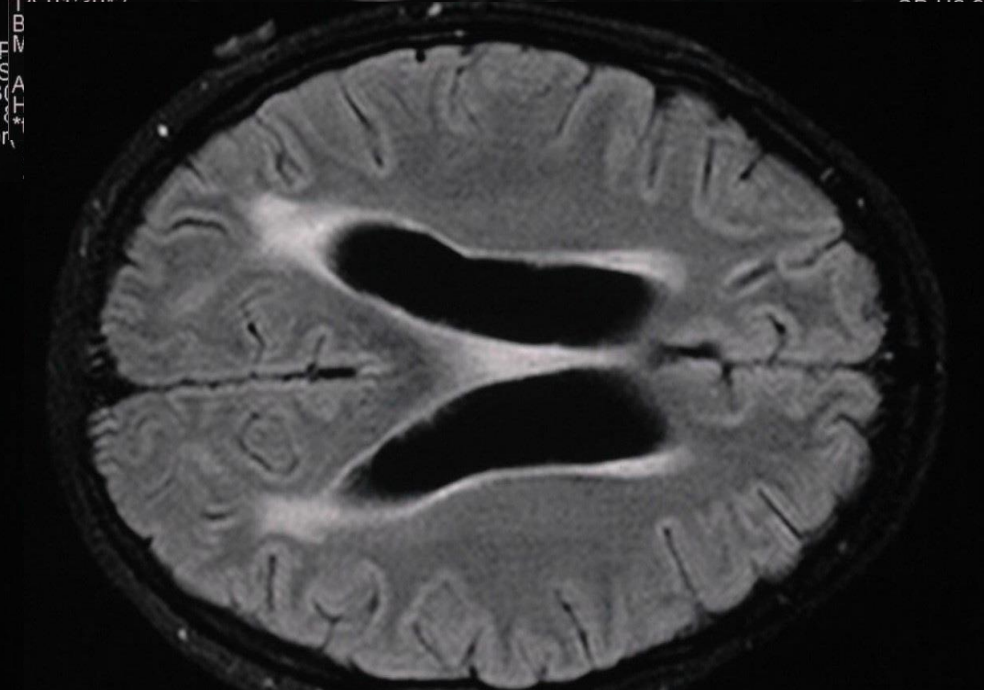
5cm





What could have happened ?

- ICP increase by epidural bolus
  - *Saline (LOR)*
  - *Local anesthetic*
  - *Blood*

- Cerebellar herniation
  - *Accidental tap (epidural)*
  - *Intentional tap (SDS, CSE) ?*
    - Less major taps ?

What did we learn here ?

- Anamnesis : preop. complaints
- Pregnancy : (un)cover disease
- Biassed neurologists
- Believe your resident (>1% tap in trainee centers?)
- 2nd EBP : critical approach
  - *No benefit, no harm ? Refuse if you are not sure*
- Where is the obstetrician ?
- Do not blame yourself too early

What else ?

- Transient neurological injury : 1/3900-6700
  - *Permanent (OB): 1/80.000 - 1/320.000 ?*
  - Numbness/weakness : 1/100-1000 (EMG?)
    - *Obstetrician ? Position ?*
    - *Pressure on lumbosacral plexus?*
- Abscedation 1/16.000-47.000 (NAP3)

  Ruppen et al, 2006 : 1/145.000 deep infection in 1,37 million OB epidurals

  Rosero & Joshi 2016 : none in 2,3 million OB epidurals
- Meningitis : <1/100.000 ?
- Spinal artery spasm (#hypotension ?), occlusion,...?

WHAT TO TELL THE PARTURIENT ?

The DO's

- Be critical in planning CNB, EBP
- Urgent MRI
  night=day, weekend=weekdays
- Inform/support patient honoustly
- Compare doses & symptoms
- Note all in the patient file
- Use low dose combinations
- Ask 2nd 'valuable' opinion (MRI)
- Timing in placement & removal
- Visit your patient regularly
- Check all tests personally
- Pre-natal information

The DON'Ts

- Loose time with CT ?
- Reassure patient
- Run patient into a panic
- Rely on incidences and…
- ….other 'care'(?)givers
- Combination of AC
- Give oral orders
- Proceed LMWH, CCB…
- End of shift report
- Consider MRI cost
- Spinal above L3 without imaging ????

The Antwerp court (cord ?) of Justice

Съезд
Congress

АССОЦИАЦИЯ АКУШЕРСКИХ АНЕСТЕЗИОЛОГОВ-РЕАНИМАТОЛОГОВ

5-7 сентября 2018 / Санкт-Петербург
September 5-7, 2018 / St. Petersburg

спасибо