



# Advanced Obstetric Anesthesia Techniques

**Thomas Baribeault DNP CRNA**

**@BaribeaultOFA**

# Contents

## **I. Medications**

- A. Dexmedetomidine**
- B. Dexamethasone**

## **II. Epidural**

- A. CLE vs CSE vs DPE**
- B. CLE vs PIEB**

## **III. POCUS**

- A. Spine**
- B. Gastric**

## **IV. PDPH**

- A. Complications**
- B. Intrathecal catheter**
- C. Sphenopalatine block**
- D. Neostigmine/Atropine**

# The Perfect Epidural

- I. No call backs/complications!!!**
  - A. Hypotension**
  - B. Top off dose**
  - C. Post-partum complications**
- II. Great analgesia/patient is comfortable**
  - A. No 1 sided/patchy blocks**
  - B. Good sacral coverage**
  - C. Covers pressure**
- III. Doesn't interfere with delivery**
  - A. Patient can feel contractions**
  - B. No motor block/patient able to push**

# Dexmedetomidine

## **Benefits**

### **I. Safety**

- A. No respiratory depression, airway reflexes, itching, pruritis**
- B. Doesn't cross the placenta**

### **II. Analgesia**

### **III. Anxiolysis**

### **IV. Reduces shivering**

### **V. Promotes lactation**

### **VI. No Amnesia**

## **Adverse effects**

### **I. Hypotension**

### **II. Bradycardia**

### **III. Prolonged motor block**

- A. When added to spinal/epidural**



# Dexmedetomidine

## **I. IV**

### **A. Indications**

- 1. Inability to cooperate for spinal/epidural placement**
- 2. Anxiety/panic attack**
- 3. Desires sedation for C-section**

### **B. Dose**

- 1. 0.5-1 mcg/kg/5-10 minutes**

# Dexmedetomidine

## I. Epidural labor analgesia

### A. Loading dose

1. CLE 10-20 mcg
2. CSE 2.5-5 mcg

### B. Top off dose

1. 25 mcg

### C. Infusion

1. 0.3 - 0.5 mcg/ml
  - a. High concentration prolong motor block after delivery

# Dexmedetomidine

## I. Cesarean Section

### A. Dose

#### 1. Spinal

##### a. 5-10 mcg dexmedetomidine

- 9-11 mg bupivacaine = 1.2-1.5 ml 0.75% bupivacaine/1.8-2.2 ml 0.5% bupivacaine
- 50-60 mg 2-chloroprocaine

#### 2. Epidural

##### a. 25-50 mcg

##### b. Prolonging the effect of the local anesthetic is can be beneficial

# Dexamethasone

## **Benefits**

- I. Faster onset/more potent than IV**
- II. Denser spinal block**
- III. Decreased post-operative pain**
- IV. Decreased nausea**
- V. Decreased pruritis**
- VI. Decreased shivering**

## **Adverse effects**

- I. Prolong motor block**
- II. Temporary decrease milk production**
- III. Increased blood glucose**

# Dexamethasone

## I. Dose

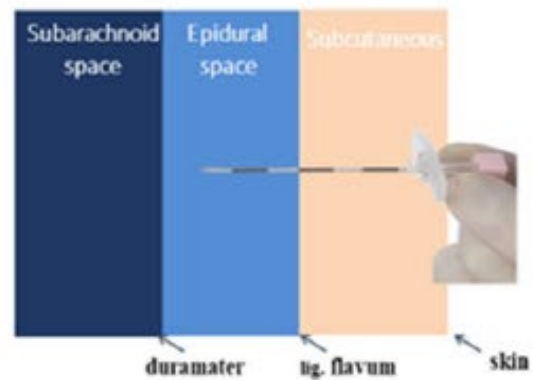
### A. Spinal

1. 4-8 mg

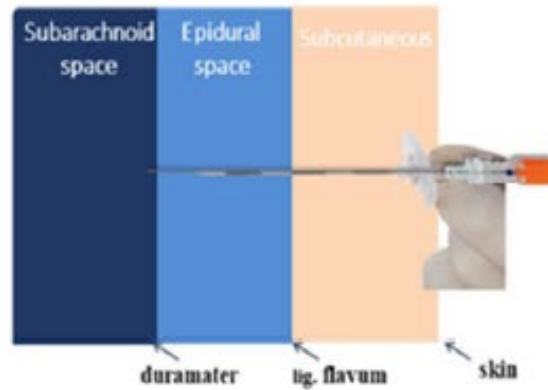
### B. Epidural

1. 4-8 mg

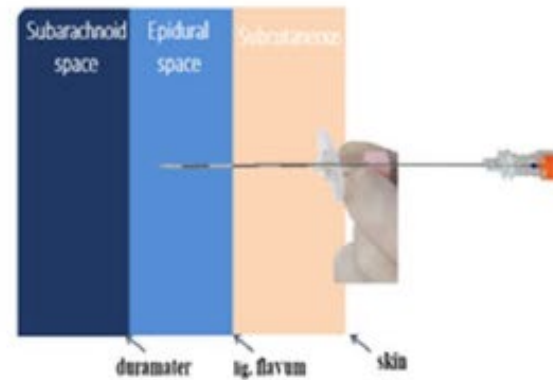
# Dural Puncture Epidural VS Combined Spinal Epidural



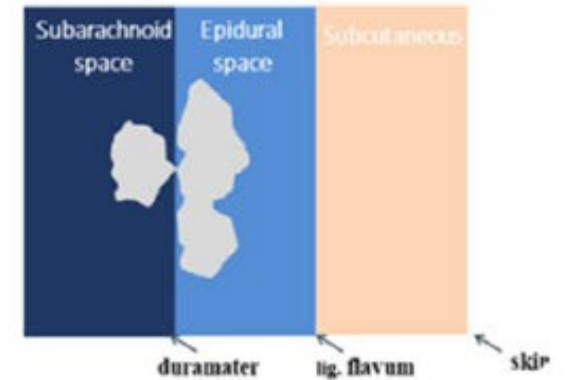
Step 1. Performing standard epidural block



Step 2. Introducing the long spinal needle with needle through needle technique like in CSE.



Step 3. Withdrawing the spinal needle without administering any subarachnoid drug and then placing the epidural catheter into epidural space.



Step 4. Most of the drug solution distribute within the epidural space while some of it translocate from the dural hole created with the spinal needle to the subarachnoid space.

# CLE vs CSE vs DPE

	CLE	DPE	CSE
Onset	+	++	+++
Sacral Spread	+	++	+++
Bilateral Spread	+	++	+++
Detect False LOR	-	+	+
Tested Catheter	+	+	-

# CLE vs DPE vs CSE

## **I. Results depends on what medications you put in the IT space!**

### **A. Issues with CSE in the literature**

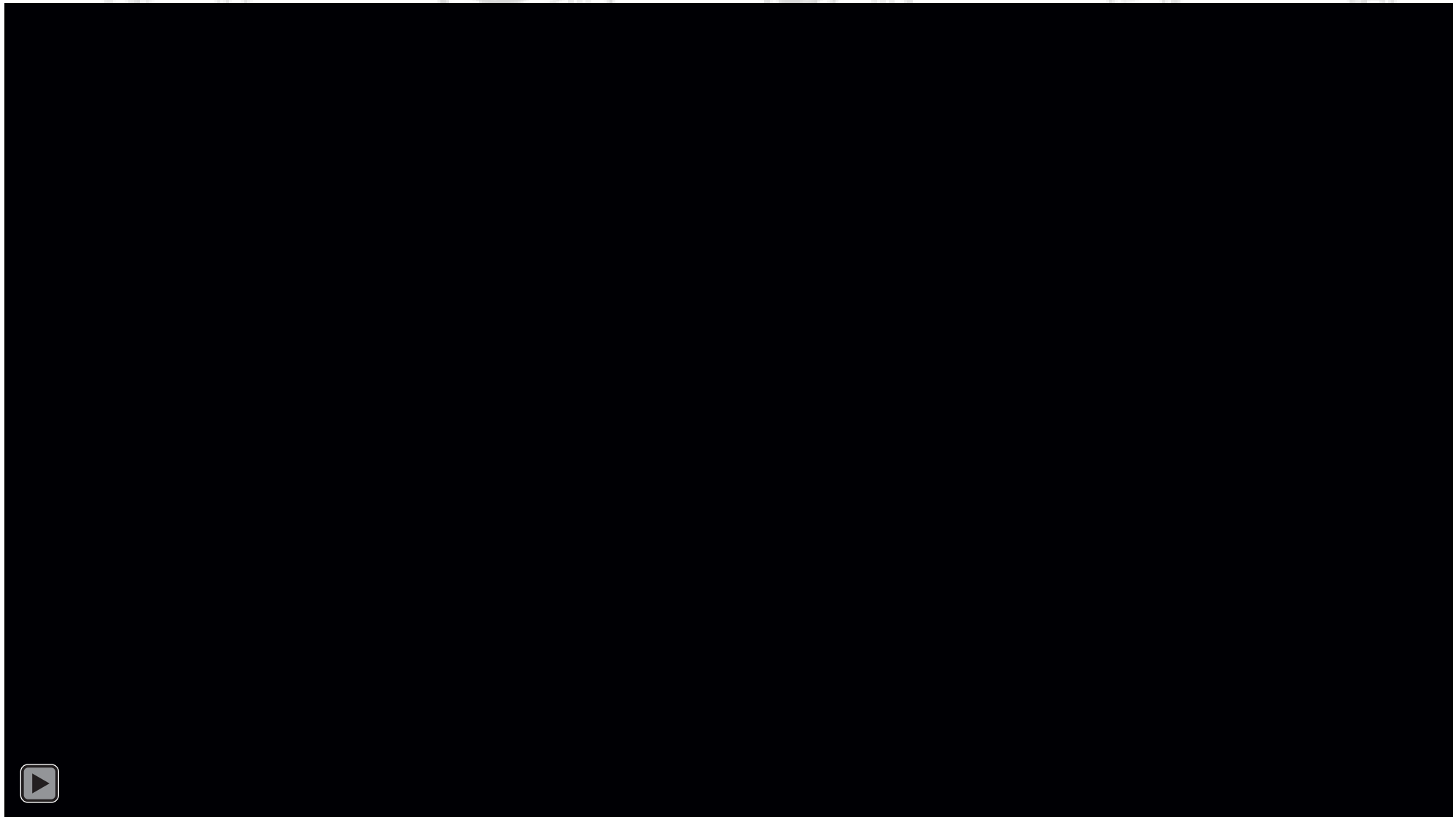
- 1. Hypotension**
- 2. More top off boluses**
  - a. DPE has fewer top off boluses**
  - b. Patient perception**
- 3. Testing catheter is controversial**

### **B. Should you avoid local anesthetics?**

- 1. Don't use a higher concentration than what is in the infusion**
  - a. Unless delivery is imminent**



# CEI vs PIEB



# CEI vs PIEB



# CEI vs PIEB

## I. Benefits of PIEB

- A. Local anesthetic sparing
  - 1. Lower concentration
- B. Higher maternal satisfaction
- C. Less need for anesthesia provider bolus dosing
- D. Less motor block

## II. Disadvantages

- A. Need specific pump
- B. Potential for error
- C. Intrathecal catheter?

# CEI vs PIEB

## **I. Continuous Epidural Infusion**

- A. CEI 8-12 ml/hr**
- B. PCA 5 ml Q 20 min**

## **II. Programmed Intermittent Epidural Bolus**

- A. 4-6 ml Q 30 vs 8-12 ml Q 60 minutes**
- B. PCA 5 ml Q 20 min**
  - 1. Will delay next intermittent bolus**

# Spine Ultrasound

## I. Benefits

- A. Correctly identify interspace
- B. Identify interspinous space
  - 1. scoliosis
- C. Fewer sticks/redirects
- D. Estimate distance to ligamentum flavum
- E. Verify epidural catheter is in the epidural space

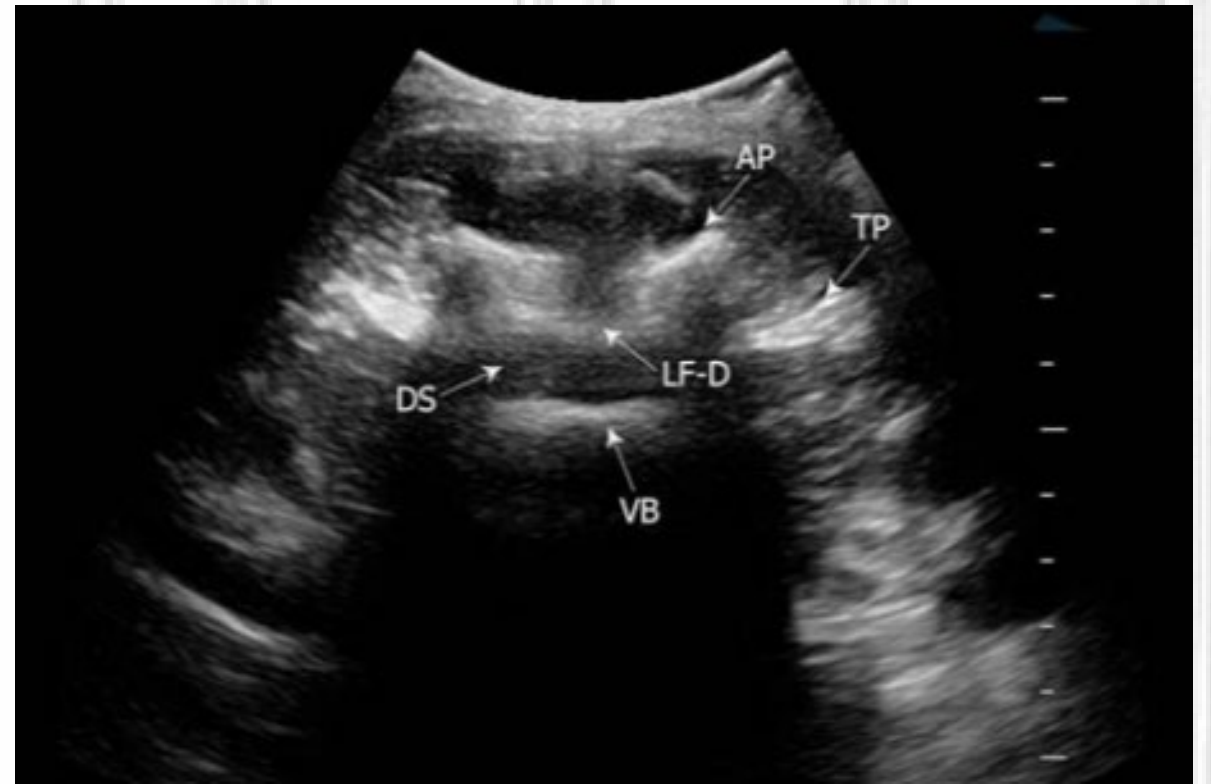
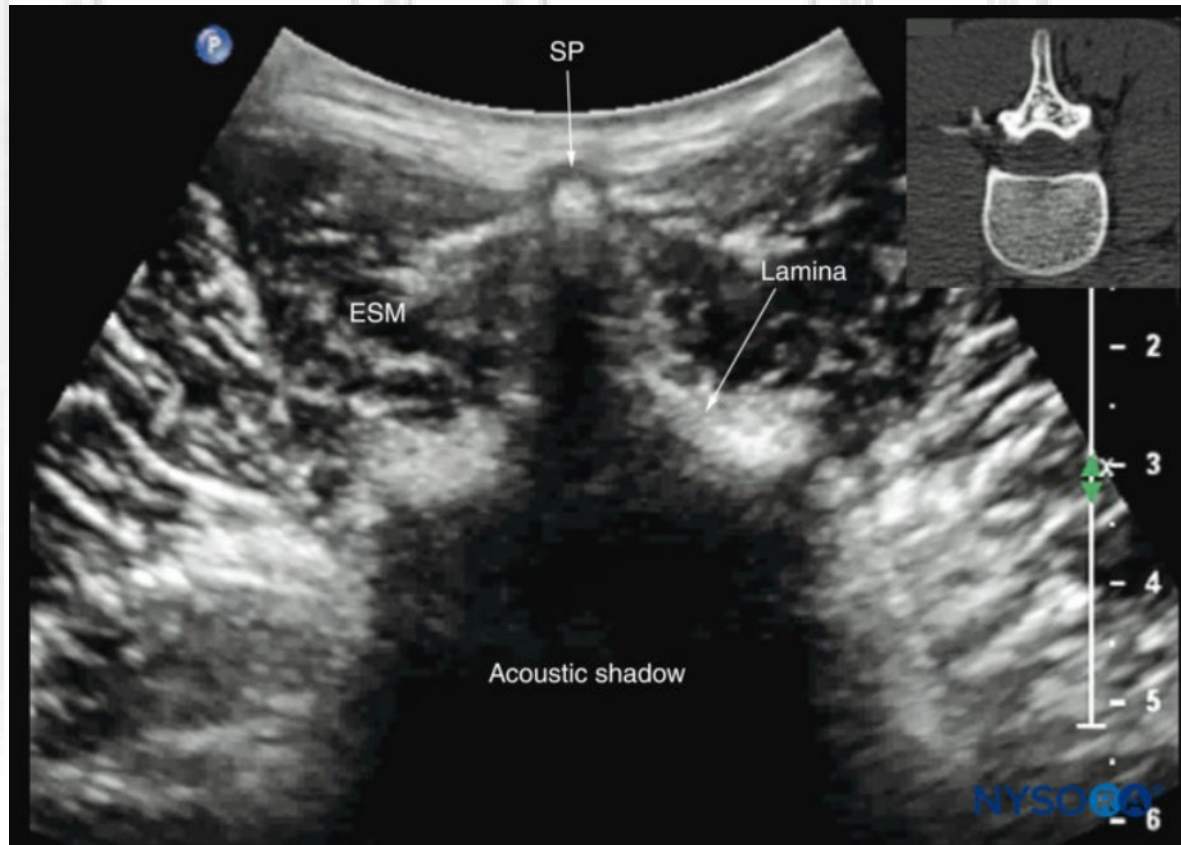
## II. Disadvantages

- A. Equipment
- B. Training
- C. Time
- D. Culture

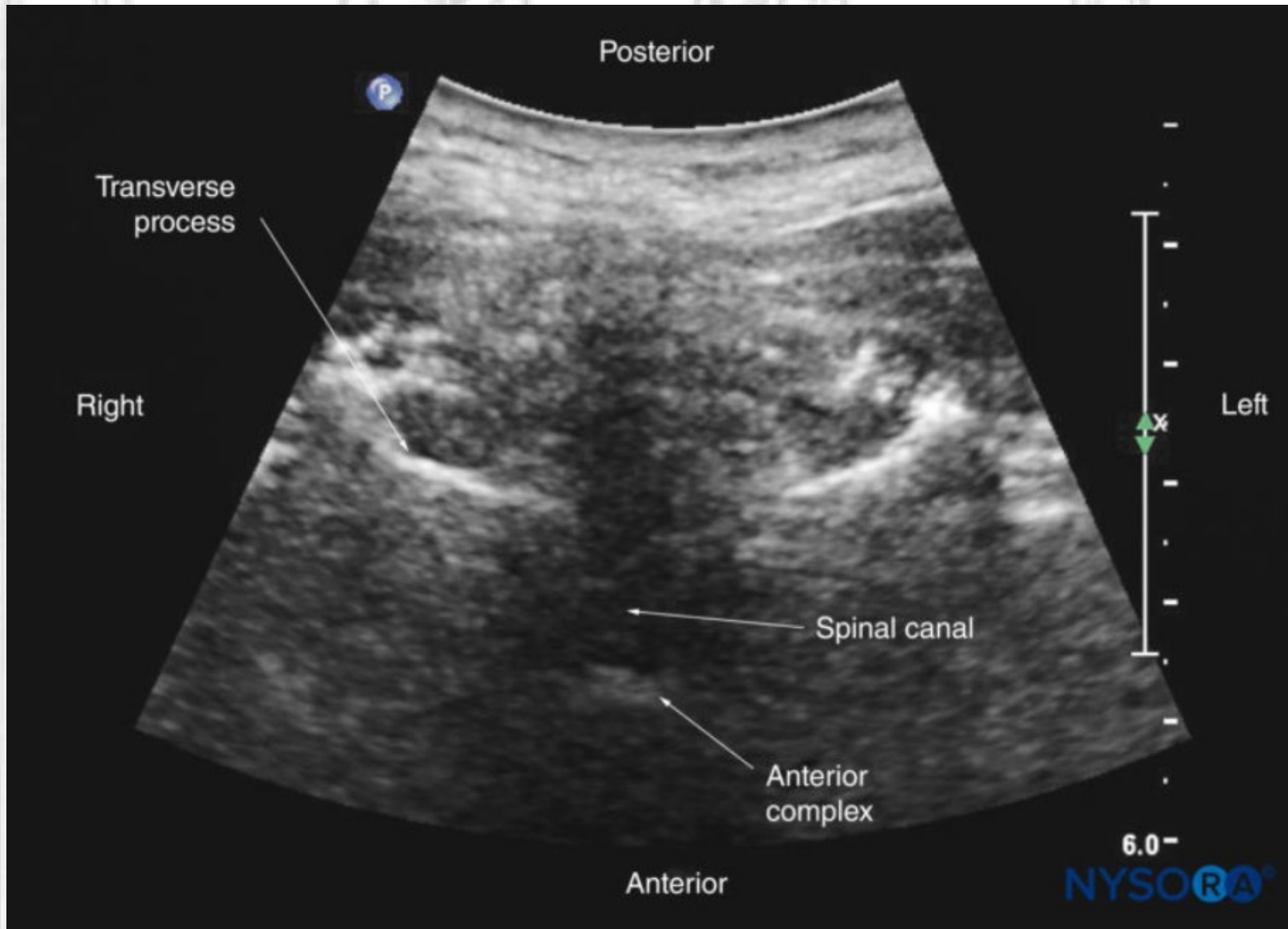
# Spine



# Spine



# Spine

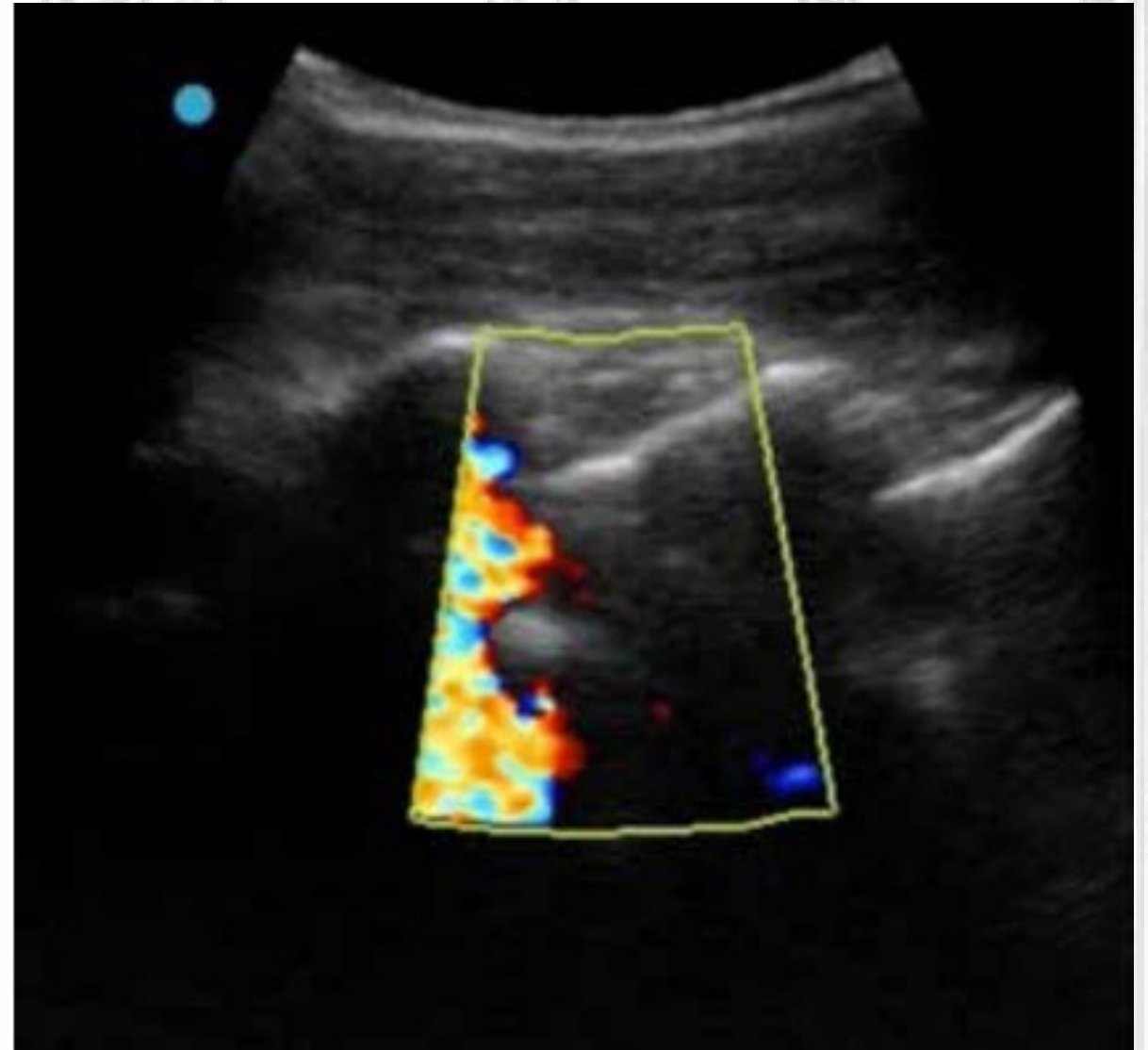
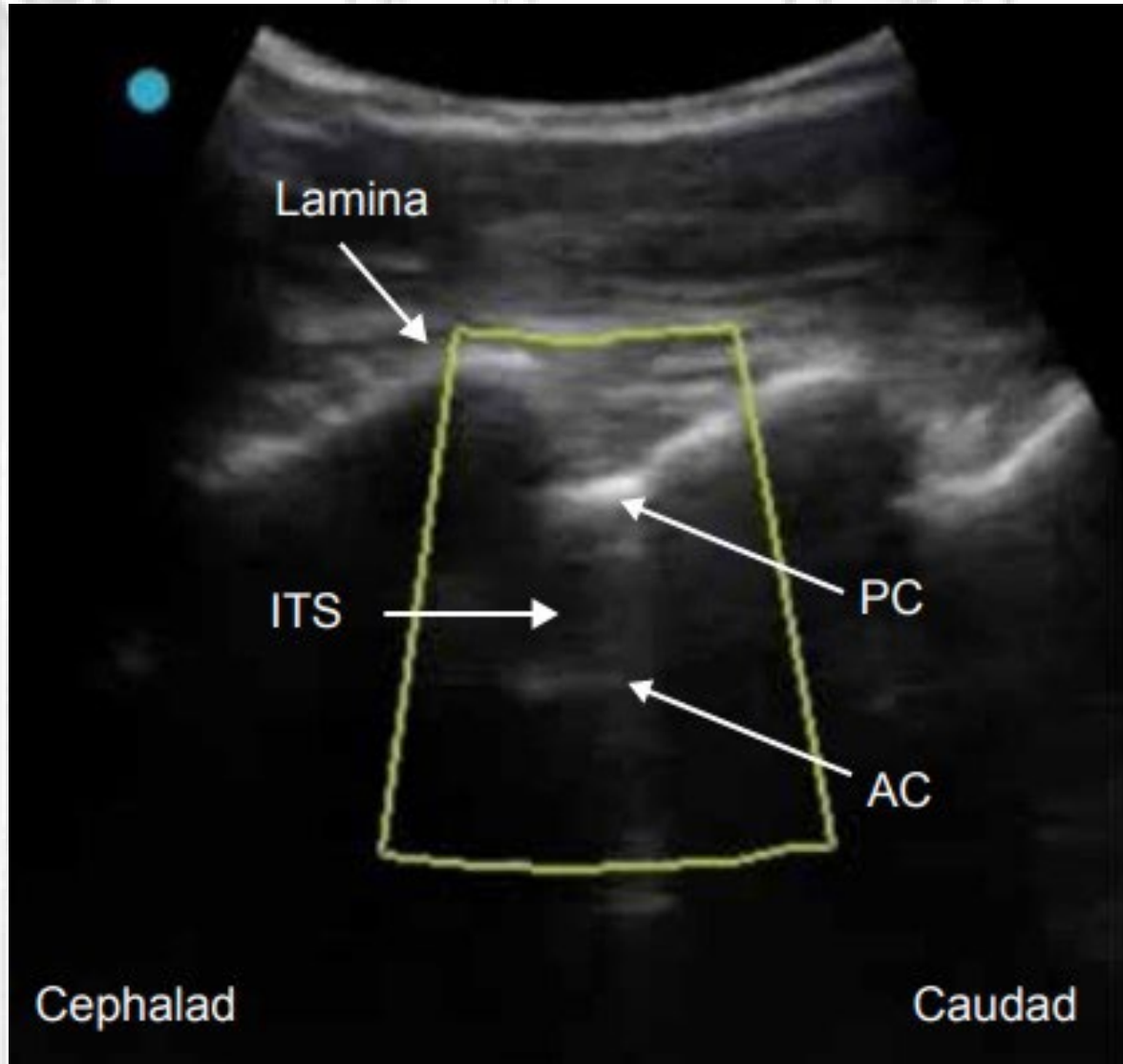




# Spine

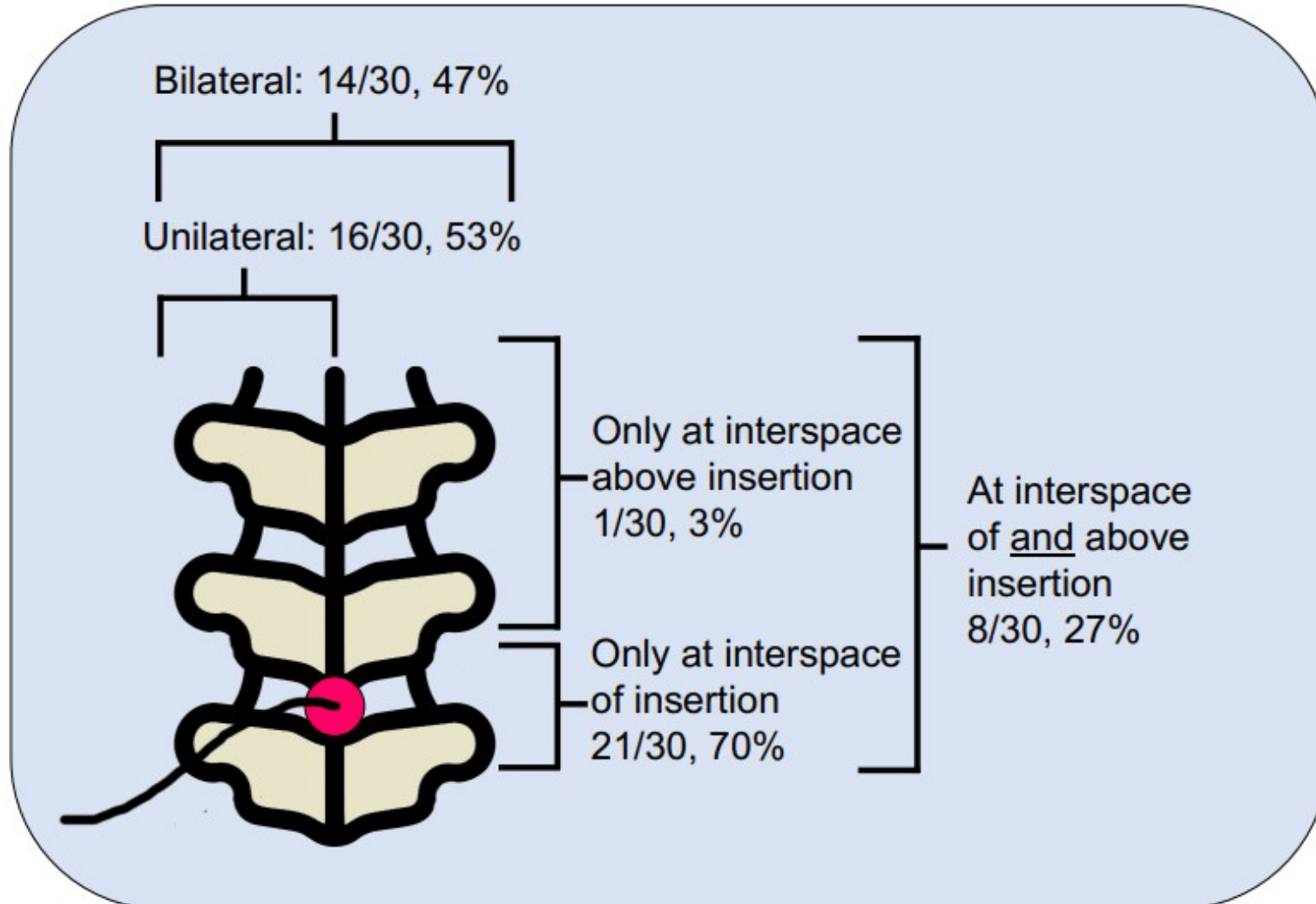


# Epidural Verification



# Epidural Verification

**Flow visualized in 30/33 patients (91%).**



# Gastric

## I. Goals

A. Empty vs Liquid vs Solid

B. Volume of liquids

1. High vs low risk aspiration

a.  $</>1.5$  ml/kg

b. CSA  $3.4\text{ cm}^2$

2. Grade 0-3

a. 0 empty

b. 1 empty supine, fluid detectable RLD

c. 2 Distended antrum supine and RLD

d. 3 Solids

## II. Difficulties with pregnant patients

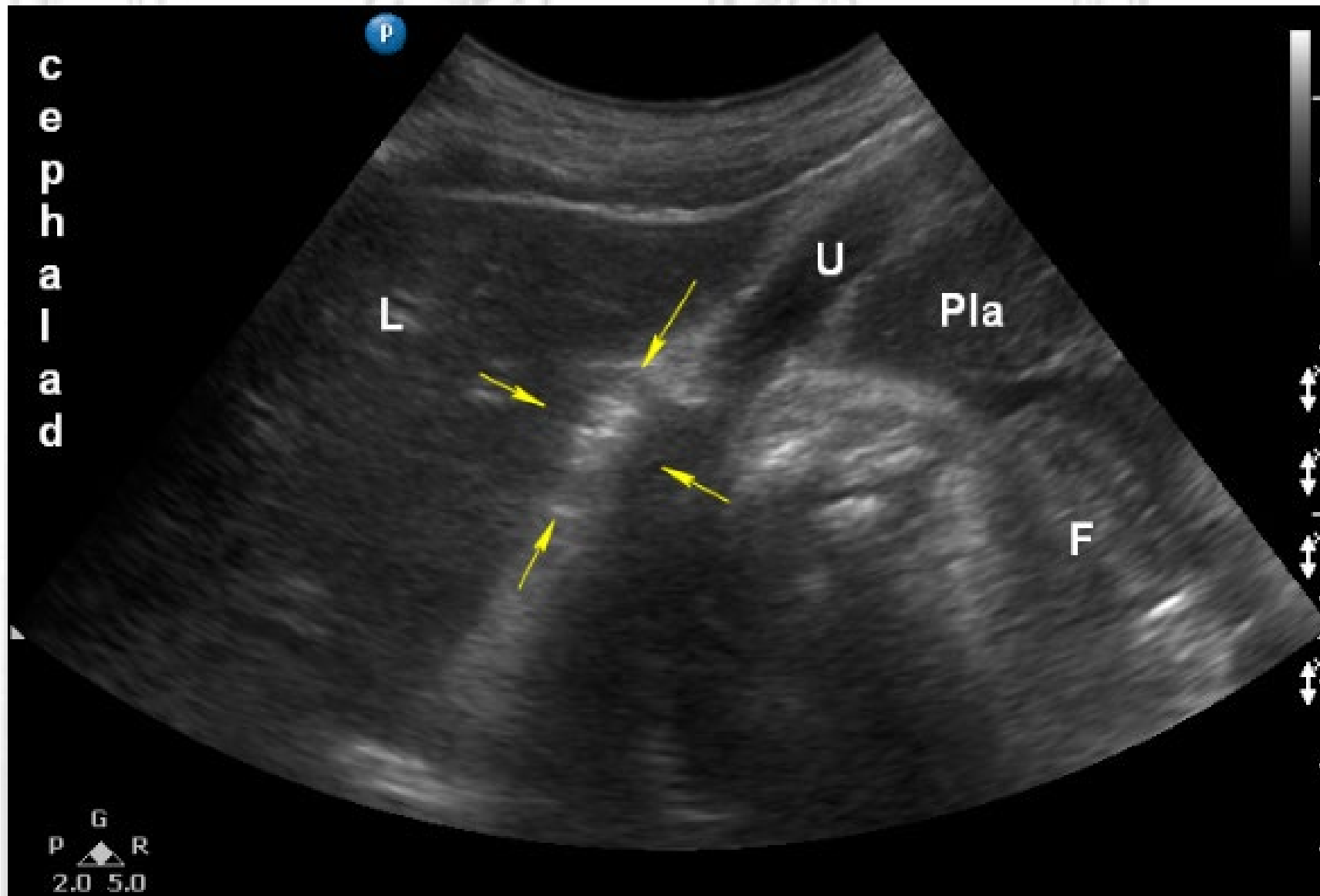
A. Stomach is displaced cephalad and to the right

B. Difficulty with probe placement due to angle of stomach to xiphoid

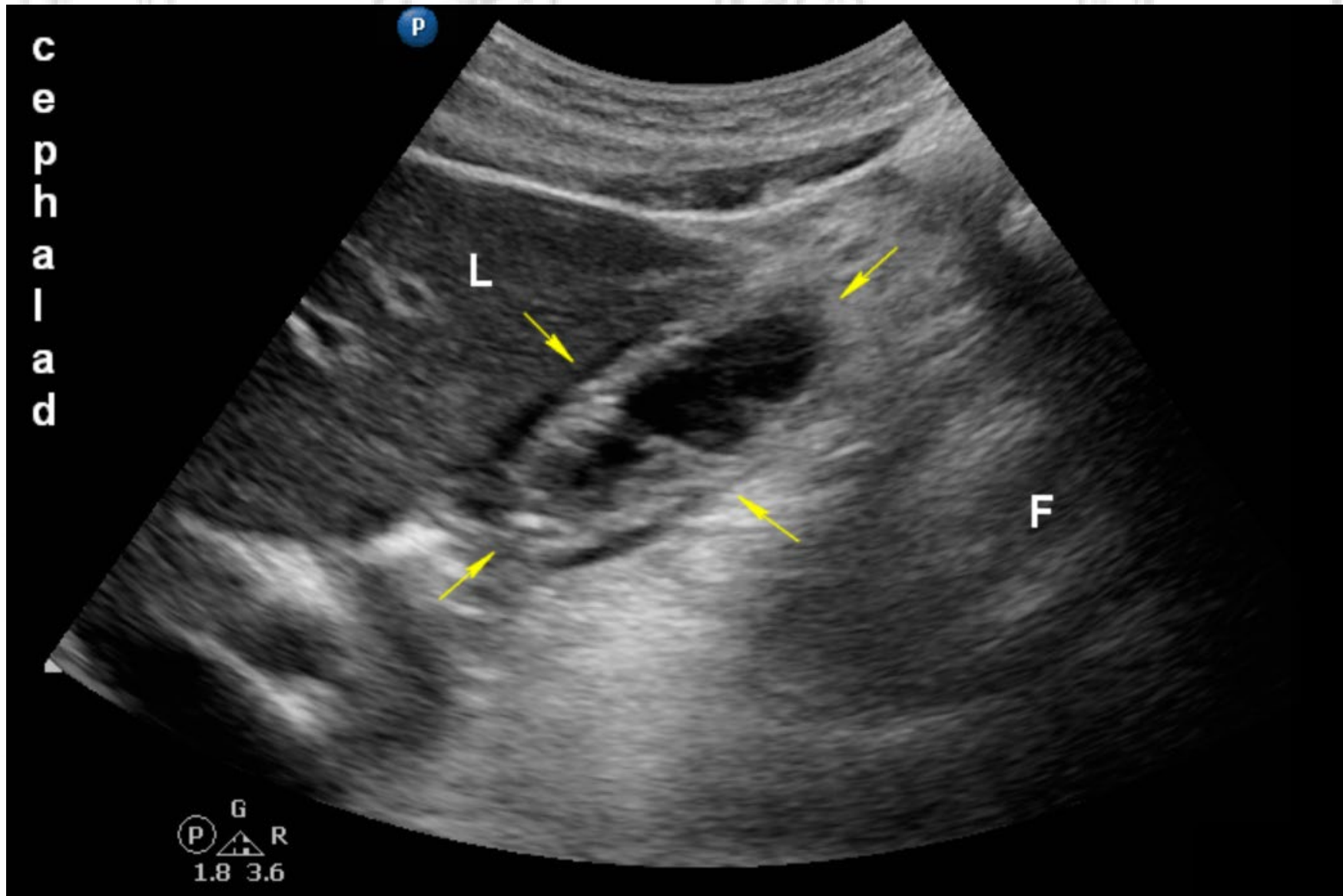
C. Rapid breathing

D.  $45^\circ$  head up

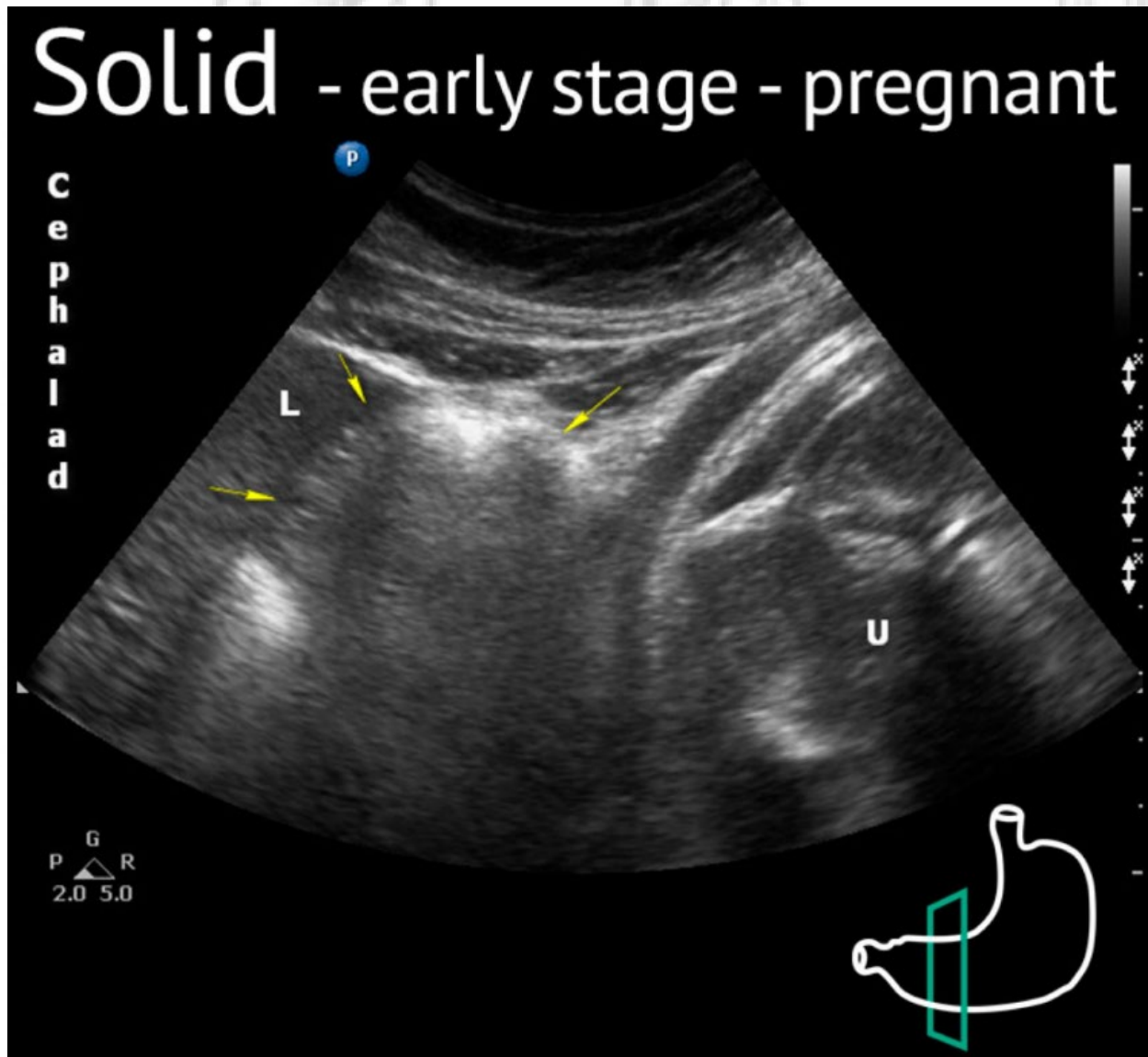
# Gastric



# Gastric



# Gastric





# Post Dural Puncture Headache

JAMA Neurology | Original Investigation

## Association Between Post-Dural Puncture Headache After Neuraxial Anesthesia in Childbirth and Intracranial Subdural Hematoma

Albert R. Moore, MD; Paul M. Wiczorek, MD; Jose C. A. Carvalho, MD, PhD

In this cohort study of 22,130,815 deliveries, there was a post-dural puncture headache rate of 309 per 100,000 deliveries and a subdural hematoma rate of 1.5 per 100,000 deliveries. For women with post-dural puncture headache, the subdural hematoma rate increased significantly, to 147 per 100,000 deliveries.



# Post Dural Puncture Headache

## **I. Mechanism between PDPH and Subdural hematoma**

- A. Decreased intracranial pressure**
- B. Stretching epidural veins**

## **II. Risks**

- A. Coagulation disorders**
- B. AV malformation**
- C. Hypertension**

## **III. Negative Risks**

- A. Obesity**
- B. Cesarean section**
- C. Early Epidural Blood Patch**
  - 1. If delayed until readmission protective benefits lost**

# Post Dural Puncture Headache

**Persistent headache and low back pain after accidental dural puncture in the obstetric population: a prospective, observational, multicentre cohort study**

**G. Niraj,<sup>1</sup> M. Mushambi,<sup>1</sup> P. Gauthama,<sup>1</sup> A. Patil,<sup>2</sup> A. Kelkar,<sup>1</sup> E. Hart,<sup>1</sup> and T. Nurmikko,<sup>3</sup>  
on behalf of the Accidental Dural Puncture Outcome Study Collaborative Group\***

# Post Dural Puncture Headache

- I. Increase in rates of chronic headache up to 18 months post-partum**
  - A. 17% vs 58%**
- II. Increase in low back pain up to 18 months post-partum**
  - A. 17% vs 48%**
- III. Intrathecal catheter did not effect long term headache or back pain**
- IV. Epidural blood patch reduces but not eliminates chronic headache**
  - A. 56% vs 86%**
- V. MRI at 18 months did not reveal intracranial hypotension or pathology causing headache**

# Intrathecal Catheter

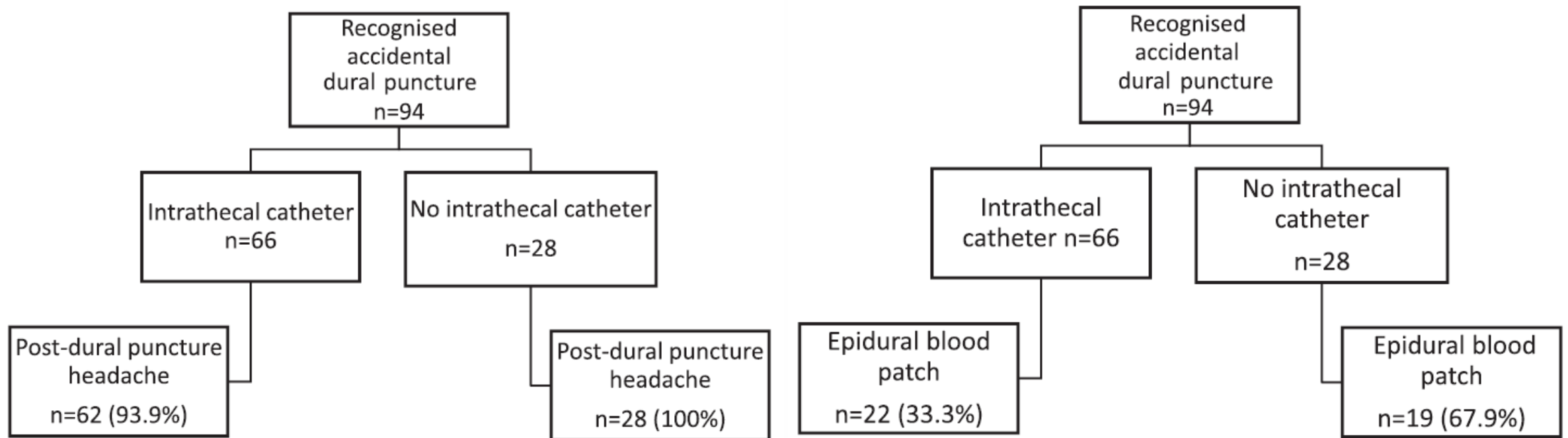
- I. After accidental dural puncture**
  - A. Thread catheter 1-3 cm into IT space**
  - B. Loading dose 1-2 ml epidural solution**
    - 1. Or what you would load CSE with**
  - C. Run epidural solution 1 ml/hr PCA 1 ml Q1h**
  - D. Leave catheter in place 24 hours**
  - E. Bolus 10 ml PF NS before pulling catheter**

# Insertion of an intrathecal catheter following a recognised accidental dural puncture reduces the need for an epidural blood patch in parturients: an Australian retrospective study

K. Rana,<sup>a</sup> S. Jenkins,<sup>b</sup> M. Rana<sup>a,b</sup>

<sup>a</sup>Medical School, The University of Adelaide, Australia

<sup>b</sup>Department of Anaesthesia, Lyell McEwin Hospital, Haydown Rd, Elizabeth Vale, South Australia, Australia



# **Addition of Neostigmine and Atropine to Conventional Management of Postdural Puncture Headache: A Randomized Controlled Trial**

## **I. Mechanism**

- A. Increased production of CSF**
- B. Cerebral vascular vasoconstriction**

## **II. Dose**

- A. Neostigmine 20 mcg/kg, Atropine 10 mcg/kg over 30 minutes Q8H**

## **III. Results**

- A. No patients in the Neostigmine/Atropine group required Blood Patch vs 16% of conservative management**

## **IV. Side Effects**

- A. Muscle cramps/twitches, urinary hyperactivity, blurred vision**

# Cosyntropin for Prophylaxis against Postdural Puncture Headache after Accidental Dural Puncture **FREE**

Sameh Michel Hakim, M.D.

+ Author and Article Information

*Anesthesiology* August 2010, Vol. 113, 413–420.

<https://doi.org/10.1097/ALN.0b013e3181dfd424>

## **I. Dose**

**A. 1 mg**

**B. Other studies have doses from 5 mcg/kg – 15 mcg/kg**

## **II. Results**

**A. 50% fewer patients in the Cosyntropin group required EBP**

## **III. Relative Contraindications**

**A. Hypertension**

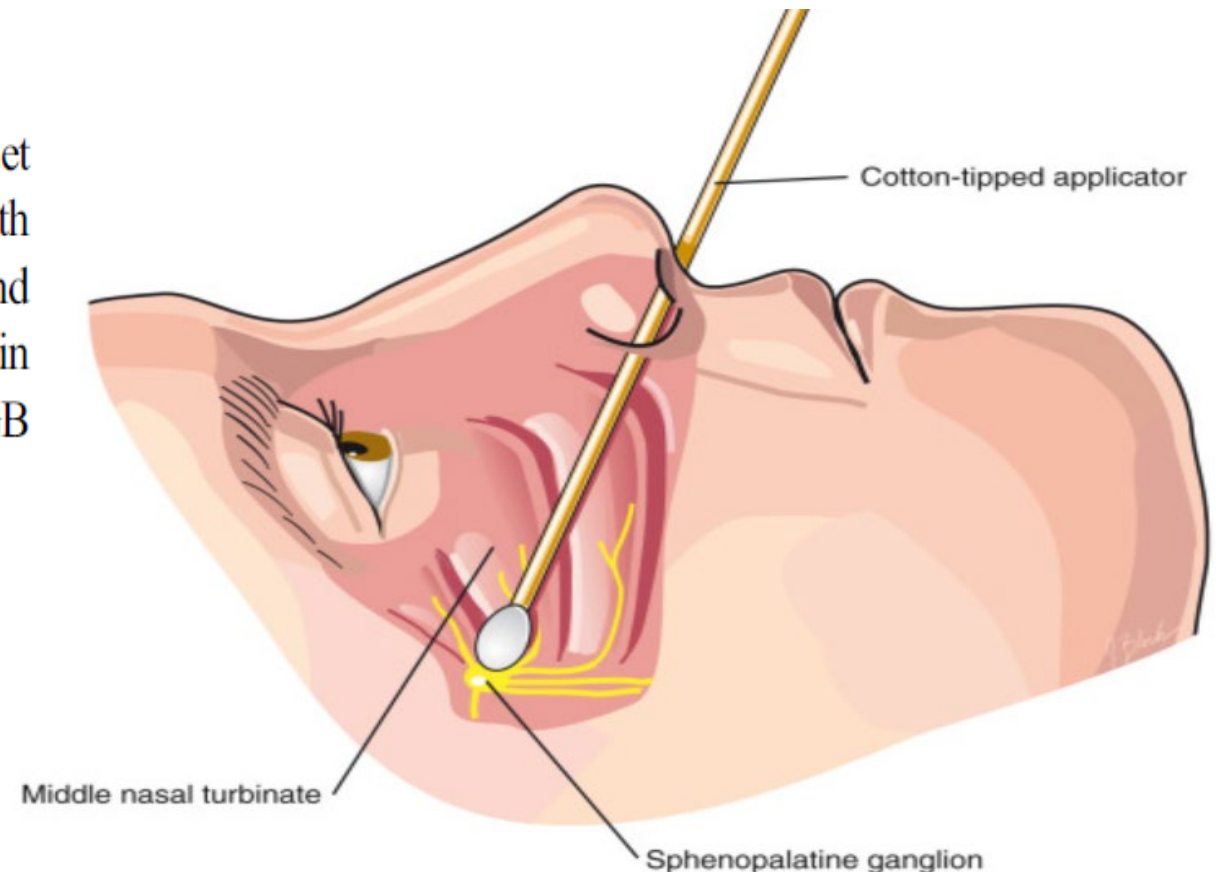
# Topical Sphenopalatine Ganglion Block Compared With Epidural Blood Patch for Postdural Puncture Headache Management in Postpartum Patients

## *A Retrospective Review*

*Shaul Cohen, MD, Danielle Levin, BA, Scott Mellender, MD, Rong Zhao, MD, PhD, Preet Patel, MD, William Grubb, MD, and Geza Kiss, MD*

**Conclusions:** A greater number of patients experienced a quicker onset of headache relief, without any new complications, from treatment with SPGB versus EBP. We believe that SPGB is a safe, inexpensive, and well-tolerated treatment. We hope that clinical trials will be conducted in the future that will confirm our findings and allow us to recommend SPGB for PDPH treatment prior to offering patients EBP.

*(Reg Anesth Pain Med 2018;43: 880–884)*





Questions?

