Modern Obstetric Anesthesiology

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Disclosures
• None

Learning Objectives
• At the conclusion of this presentation, the participant should be able to:
  1. Summarize the OB anesthesiologist’s role on and off the labor and delivery unit.
  2. Apply modern obstetric practice to up-to-date evidence-based OB anesthesiology.
  3. Analyze the different types of coagulation screening and recognize their implications as they pertain to OB anesthesiology.
  4. Identify maternal co-morbidities that may affect OB anesthetic options.
Case 1

- 31yF G1P0 at 39w gestation, o/w healthy,
- Seen at clinic found to be breech
- Strongly desires vaginal delivery
  - Wants external cephalic version
  - Wants to discuss spinal because RN suggested it might be a good option
  - Desires neuraxial for labor (even better)

Neuraxial Anesthesia for ECV
**Case 2**

- 23yo G1P0 at 35w2d gestation
- PMHx:
  - Factor V Leiden, no clot history.
  - Runner, o/w healthy.
- Meds: Lovenox 40mg QD, last dose 22 hours ago
- Arrive to triage with headache
- BP: 147/80 (repeat), HR 87, RR 18, Temp 37.3
- HELLP labs: Plt. count 90 (5 days ago was 121), LFTs/LDH wnl
- Headache resolves with conservative measures.
- Strongly desires vaginal delivery. Magnesium, IOL planned.

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**Wants to know analgesic options:**

- Nitrous Oxide?
- Other Options?

- Has read a lot online about “Epidurals”

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**Nitrous oxide in Labor**

- Safe?
  - Worldwide use
  - Few, if any, maternal adverse events: *easily reversible*
  - No increased NICU admission or changed APGARs

- Effective?
  - High satisfaction scores regardless of pain scores
  - Alternative if epidural not possible, contraindicated
  - High conversion rate to neuraxial

- **Gets anesthesiologist in the room!**

*Birth 2018; Richardson et al.
OBG Management, 2018; 30:29
Anesthes. Analg. 2007; 104:148*
Other alternatives to an epidural

• Remifentanil
  • Significant respiratory depression events and even arrest
  • Requires complex monitoring. Anesthesia provider in room.
  • Impractical, probably unsafe

• Dexmedetomidine
  • Minimal placental transfer
  • Likely much safer, but limited experience and data
  • Still impractical except in rare specific circumstances

• Bottom line: Nitrous probably the best alternative

Myth: Epidurals make labor longer and increase surgical delivery rates.

• When modern low-dose epidural infusions are used there is NO increase in:
  • First stage
  • Second Stage
  • Instrumentation
  • Cesarean Section

Effects of Epidural Labor Analgesia With Low Concentrations of Local Anesthetics on Obstetric Outcomes: A Systematic Review and Meta-analysis of Randomized Controlled Trials

Original Research
Epidural Analgesia During the Second Stage of Labor
A Randomized Controlled Trial
Myth: Early Epidurals cause problems

Cesarean Birth: Consensus Statement
National Partnership for Maternal Safety
Consensus Bundle on Safe Reduction of Primary Cesarean Births—Supporting Intended Vaginal Births

- "Too early" for an epidural is NOT evidence based
- Maintain motor function (continue in 2nd stage)
- Allow patient control (PCEA)

- Low infusion concentration!

Myth: Epidurals impact breastfeeding success

- Unlikely
- Poor pain control might NEGATIVELY impact

Myth: Epidurals increase Depression risk

- No increase in short term
- DECREASE in long term
- PAIN associated with increased PPD risk
Overall Risk ~ 1:200,000-300,000 if appropriate epidural placement

Myth: Epidurals Paralyze people

Myth: Anticoagulated patients can’t ever get epidurals

Myth: Thrombocytopenia Contraindicates Epidurals

- No guidelines – yet
- Platelets >70-100k probably ok*
- Trend more important than absolute number
- HELLP more worrisome than ITP/Gestational
- Patient individualization!!!
Myth: Preeclampsia contraindicates epidurals

Practice Guidelines for Obstetric Anesthesia
An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology

- Consider early insertion of a neuraxial catheter for obstetric (e.g., twins gestation or preeclampsia) or anesthetic indications (e.g., anticipated difficult airway or obesity) to reduce the need for GA if an emergent procedure becomes necessary.

Myth: All Epidurals are the same
CSE vs. DPE vs. Epidural

- Spinal access/dose → Analgesia onset rapid
- Confirms neuraxial location → Decreased need to replace epidural
- Confirms midline position → Increased ideal bilateral blockade
- Improved rate of need for top-ups → Less need to call anesthesiologist
- Overall: Increased epidural success and satisfaction

- Intrathecal dose that is given is multifactorial, depends on:
  - Patient factors
  - Stage and progress of labor
  - Specific anesthesiologist

- Programmed Intermittent Bolus (PIB):
  - ↓ breakthrough pain
  - ↓ hourly consumption of local anesthetic
  - ↑ maternal satisfaction
  - NO Difference in:
    - Duration of labor
    - Forceps or C/S
    - Neonatal M+M
    - ↓ motor block
A picture is worth 1000 words...

- 10 ml/hr continuous infusion
- 10 ml/hr intermittent boluses

Patient satisfaction is individual...

"I was beginning to think I just couldn’t do it [labor]. But after talking to you I wasn’t scared of the epidural anymore and it didn’t take the experience of my birth away. It made me feel empowered."

A real patient who came in with a detailed birth plan and desire for natural childbirth who ended up with an epidural...
Case 3

- 32yo G1P0 38w patient arrives in Triage painfully contracting
- Vertex, 3cm, 50%, +2
- MHx, SHx: None. Meds: PNs.
- Anesthesia discusses options
  - Patient says she “want to wait”
- Soon after arrival FHR
  - Sustained fetal bradycardia
    - Emergent move to operating room
    - Splash prep → Drapes → Induction of GA → Airway
      → “cut” → Incision → Baby out in <1 min

Continued: Intraoperative PPH

- Cesarean Delivery without difficulty
- APGARs: 6 and 9
- 35 minutes in EBL is 1500
- General anesthesia increases risk of hemorrhage
  - ATONY EFFECT!!
    - Volatile anesthetics (“sevo” “des” “iso”)
    - Convert to partial nitrous +/- “TIVA”
- RN asked to get Tranexamic Acid.
We ask for TXA but it isn’t in the OR. Nurse needs to get it. Why?

Intrathecal TXA → Seizure, Myoclonus, and likely DEATH

BUT: Why General? Why not a Spinal?

Neuraxial the gold standard, right??

- AVOIDABLE GETA
  - Increased Surgical Infection
  - Increased Thromboembolism
  - Increased anesthesia complications
  - No increase in death or cardiac arrest
High Spinal almost 6x more common than failed intubation

ASA CLOSED CLAIMS DATA

Major causes of maternal death by type of anesthesia:

<table>
<thead>
<tr>
<th>NEURAXIAL ANESTHESIA</th>
<th>GENERAL ANESTHESIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive blood loss - 25%</td>
<td>Excessive blood loss – 53%</td>
</tr>
<tr>
<td>High block / total spinal – 20%</td>
<td>Embolic events – 16%</td>
</tr>
<tr>
<td>Embolic events – 20%</td>
<td>Difficult intubation – 6%</td>
</tr>
<tr>
<td>Neuraxial cardiac arrest – 5%</td>
<td>Other respiratory events – 6% (aspiration, bronchospasm, etc.)</td>
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</tbody>
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Slide credit: Joy Hawkins, MD
So... mom will probably be ok. But what about the baby?

FDA Drug Safety Communication 2017:
“The U.S. Food and Drug Administration (FDA) is warning that repeated or lengthy use of general anesthetic and sedation drugs during surgeries or procedures in children younger than 3 years or in pregnant women during their third trimester may affect the development of children’s brains.”
Spinal Anesthesia

Emergent "CRASH" Delivery

Patient's Room

General Anesthesia

Position for spinal, Monitors

1 min

Lay supine w/ LUD, monitors, 100% O2

1 min

GetA drugs, splash prep and drapes

1 min

Induction, airway, confirmation of ventilation/anesthesia

1 min

“CUT!”

5-15s (or more)

Position supine, LUD, prep, drapes

Adequate anesthesia for CS

1 min

DELIVERY

1 min

Total: 14-29 minutes

Total: 7 minutes

But if we start before the spinal is FULLY set the time difference is less...

• 42% surgery allowed to start with inadequate block
• Despite inadequate block reluctance to convert to GETA
Case 4

- 27y G3P2 at 27 weeks gestation presents for right ORIF humerus
- Surgeon requests no nerve block/regional until postop for assessment radial nerve function
- GETA planned
- Patient is otherwise healthy
- Betamethasone timing appropriate
  - Patient seen in PPS days prior
  - OB consulted by surgical team days prior for planning
- Assigned anesthesia team is not OB specialized
  - Phone call to me from my partner: “So what do I need to do different for this patient?”

Not much!

“Shouldn’t we wait till after she gives birth?”

INTERIM UPDATE

ACOG COMMITTEE OPINION

- Key: A pregnant woman should never be denied medically necessary treatment or have it delayed.
- Miscarriage/induction for unclear anesthesia/sedation drugs effects on the developing brain
- Steroids benefit/fetal monitoring where appropriate.

Summary of Modern Obstetric Anesthesia

- The OB anesthesiologist should:
  - Contribute positively to a “normal” birth experience
  - And when that’s not possible, contribute to maximum safety for mom (and by extension, baby)
  - Aid in minimization of unnecessary/unwanted cesarean section
  - Be an advocate for maternal care optimization
  - Be available for formal/informal consult and discussion
  - Be a resource of information for OB providers and non-OB anesthesiologist colleagues
Thank You!

- Dr. Joy Hawkins
- Dr. Vesna Jevtovic-Todorovic
- Dr. Brenda Bucklin
- Dr. Rachel Kacmar
- Dr. Cristina Wood
- All of YOU!!

Questions?

Exposure to GETA for Cesarean and Odds of Severe PPD?!!

- No control for emergent delivery
- No control for comorbidities
- No CAUSAL relationship found, only association
- Does appropriately indicate that GETA should be avoided, when avoidable, but doesn’t give an evidenced based reason for this...
- Overall a VERY poorly done study, fully observational so no causal relationship able to be determine but still IMPLIED.