SOAP
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Simulation Patient Design (May, 2024)
Case of Postpartum Tubal Sterilization

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Introduction:

Postpartum Tubal Sterilization is one of the most effective and popular forms of contraception in the United States, relied upon by 18.6% of women aged 15–49 years using contraception. Nearly half of procedures are performed during the postpartum period, yet many women who desire postpartum sterilization do not undergo the procedure. Factors that may decrease the likelihood of a patient obtaining the desired postpartum sterilization include patient-related factors, physician-related factors, lack of available operating rooms and anesthesiology personnel, federal consent requirements, and receiving care in some religiously affiliated hospitals. The immediate postpartum period after vaginal delivery or at the time of cesarean delivery may be the ideal time to perform sterilization because of technical ease for the physician and convenience for the patient. Childbirth also may be the only time some people access health care and the procedure itself does not lengthen hospitalization.[1]

The American College of Obstetricians and Gynecologists (ACOG) defines postpartum tubal ligation (PPTL) as an urgent procedure due to the limited optimal surgical timeframe. Typically, postpartum sterilization procedures are performed in labor and delivery operating rooms with obstetric anesthesia personnel. Performing postpartum sterilization may be difficult when several deliveries are imminent or with inadequate staffing on hospital's labor and delivery ward. Lack of operating room space or unavailability of anesthesia personnel can account for 10–33% of unfulfilled requests for postpartum tubal ligations. An example of a medical condition that frequently leads to unfulfilled immediate postpartum sterilization requests is morbid obesity. Perceived risks of longer operative time, greater surgical complications, and technical difficulty with completing the procedure have been common reasons for physician refusal to proceed with the procedure in patient with obesity.[2]

The use of an existing labor epidural catheter has been proposed as an efficient way to provide anesthesia for PPTL. Older studies reported epidural reactivation success rates varying from 74% to 92%. Predictors of failure included poor patient satisfaction with labor analgesia, increased delivery-to-reactivation time, and the need for manual top-ups during labor and delivery. Providers have suggested that rates of failure when attempting catheter "reactivation" for PPTL do not support the practice of leaving a labor epidural catheter in place for an interval PPTL. Instead, these providers advocate the routine removal of the epidural catheter followed by a *de novo* spinal anesthetic (SA). For those without preexisting epidural analgesia, the successful use of spinal anesthesia with hyperbaric bupivacaine with or without opioids has been reported.[3]

Ultimately, the decision to use a particular type of anesthetic for PPTL should be individualized based on obstetric and anesthetic factors, as well as considering patient preference. Neuraxial anesthesia, however, seems to be the favored approach, as the time for maternal physiology to return to baseline in the postpartum period is not well delineated and to reduce risks of pulmonary aspiration of gastric contents and difficult/failed intubation.[3]

Educational Rationale: To teach team skills in the anesthetic management of postpartum tubal ligation and managing conflicts and complications that may arise before or during the procedure.
Target Audiences: Anesthesiologists, Obstetricians, Resident Physicians, L&D nurses, and L&D support staff
Learning Objectives: As per the Accreditation Council for Graduate Medical Education (ACGME) Core

Competencies

Upon completion of this simulation (including the debrief), learners will be able to:

- ***Medical knowledge***: Understand how the physiologic changes of pregnancy and postpartum and the timing of PPTL may affect anesthetic management decisions for postpartum tubal ligation.
- ***Patient care***: **Learn to** assess the postpartum patient for possible comorbidities and decide the most appropriate anesthetic choice. Assess/investigate NPO time, peripartum blood loss, uterine tone, uterotonic use, O2 requirement, and newborn's health.
- ***Practice-based learning and improvement***: Identify labor and delivery floor needs at the time postpartum patient is ready for PPTL.
- ***Interpersonal and communication skills***: Role assignments to coordinate the team to provide optimal care to the patient and maintain ongoing communication about the clinical situation.
- ***Professionalism***: Demonstrate mutual respect for the expertise of other team members.
- ***Systems-based practice***: Encourage greater understanding of barriers, consequences, and disparities around postpartum sterilization so the obstetric anesthesiologist can better collaborate with other maternal care providers to promote quality outcomes.

Questions to ask after the scenario:

1) What is the best time frame to perform PPTL postpartum? Social factors?
2) What are the advantages performing immediate postpartum (fallopian tubes at the level of umbilicus, abdominal wall laxity allows for manipulation, lower failure rate) vs. 6-8 weeks postpartum?
3) What are the factors that delay the immediate PPTL?
4) What are the anesthetic options for PPTL? In-situ labor epidural reactivation vs spinal vs general anesthesia?
5) What are the factors that affect labor epidural reactivation failure?
6) Which anesthetic technique is the safest? Why?
7) Do you have concerns performing PPTL with GETA?
8) What concerns or impact with Roe v Wade overturn on PPTLs?

Assessment Instruments:

1. Learner Knowledge Assessment form (Appendix 1)
2. Simulation Activity Evaluation form (Appendix 2)

Equipment Needed and Set-up:

In-situ set-up

- **Location:** L&D Room and L&D OR
- **Personel:** Simulated postpartum patient/Mannequin, L&D nurse, obstetrician, obstetric anesthesiologist, L&D OR staff
- **Equipment:** Monitors: NIBP, EKG, pulse oximetry
- 18 GA IV: lab draw and IV start kits
- Epidural catheter in place, epidural infusion pump is paused postpartum
- Anesthesia machine and cart set up for OR case

Simulation Scenario Set-up:

The case

35 year old G8P6026 now 2 hours s/p uncomplicated vaginal delivery with labor epidural in situ. Her epidural functioned well during labor and is now continued on a low dose infusion. Her last oral intake was a heavy meal approximately 3 hours prior to arrival in triage in active labor (now 7 hours ago). Her pregnancy has been uncomplicated, and all her past deliveries were uncomplicated vaginal deliveries. She states that she is feeling well with no issues. She desires to get her PPTL after her postpartum recovery and she signed her consent papers a month ago.

Physical exam:

Weight 87 kg, Height 1.65 meters, BMI 32

Vitals: HR: 98 bpm, BP: 114/68 mm Hg, SpO_2 98% (room air), Temp 36.9^0 C

Admission Labs: Hb 12.5 g/dL, Plt 254 x10^9/L

HEENT/Airway: MP3, small mouth opening, full neck ROM, large tongue CV: RRR; no murmur Resp: CTAB

Abdomen: postpartum soft, non-tender Neuro: alert and oriented

Simulation Pre-brief

- Read the scenario and instruct team members on their role during the simulation
- The learners take their places
- L&D Nurse, OB and Anesthesiologist are available
- NICU is assessing the newborn.

Scenario Details

Trigger	Patient Condition	Action	Done	Time	Comments
Patient in L&D room s/p NSVD 2 hours prior. Epidural is set at low dose (0.0625% bupivacaine at 5 ml/h). Postpartum, with slightly above average postpartum bleeding. Awaiting PPTL.	Patient is awake and responsive. HR 105 bpm BP 100/65 mm Hg SpO_2 98% (air) Resp 14/min Temp 37.1^{o}C	• L&D nurse performs fundal checks to assess bleeding. • Calls the OB to assess the patient's vaginal bleeding. • Informs the anesthesiology team. • Fluid resuscitation initiated with fluid bolus given. • Oxytocin rate is increased. • Consider uterotonics: Methergine and TXA • Ask for QBL.			
Postpartum bleeding is now well controlled s/p methergine. Jump forward: Now 6 hours postpartum. QBL: 950 ml	Labs: Hb 10.2 g/dL Plt 130 x10^9/L Hemodynamically stable. HR 91 bpm BP 126/67 mmHg SpO2 97% (air) Resp 15/min	• L&D nurse calls Anesthesia team to bolus epidural for PPTL. • Anesthesia assesses the sensory level: T12 bilateral to ice. • Consider giving epidural test dose of 1.5% Lido+1:200.000 Epi- test dose is negative			

Patient is ready for PPTL.		• Begin to bolus with 2% lido+1:200.000 Epi (with or without bicarb). 20 ml is given in divided 5 ml increments. • Aspiration prophylaxis is given- Metoclopramide and Bicitra.			
Patient in OR 10 minutes since last lidocaine bolus (entire 20 ml lidocaine given).	Supine, awake and oriented. HR 101 bpm BP 120/67 mm Hg SpO_2 98% (air) Resp 15/min Temp 36.9^oC Her epidural level to pinprick is T8 bilateral.	• Additional 5 ml of 2% lidocaine given to increase the level. • Consider discussing with patient additional neuraxial versus general anesthesia if level does not rise. • Surgeon wants to start the case before he is called to another delivery.			
Patient is prepped and draped. Level to pinprick is T7 bilateral.	There are 10 more actively laboring patients on the floor. Patient is sleepy but responsive. HR 90 bpm BP 110/70mmHg RR 12/min SpO_2 97% (air) She wants to get her PPTL. She states she will lose her insurance within 30 days.	• Allis test failed. Patient felt sharp pain in the periumbilical area. Dicussion for why neuraxial may have failed. • The anesthesia team discusses anesthetic plan. Decision to replace epidural with DPE instead of spinal to prevent high spinal. However, patient refuses to have another procedure in her back and requests general anesthesia. • Discuss proceeding with general anesthesia vs encouraging additional neuraxial procedure. • Start preparing medications and intubation equipment for general anesthesia.			
Anesthesia team is getting ready for induction.	Patient is frustrated but wants to proceed. After intubation: HR 122 bpm BP100/65 mm Hg SpO_2 95% (air) Resp 20/min Temp 36.8^oC	• Preoxygenate with 10 L/min via non-rebreather facemask. • RSI with cricoid pressure: Propofol, Succinylcholine, Lidocaine, and Fentanyl IV are given. Sevoflurane and nitrous for maintenance. • Grade 1 view with glidescope.			

PPTL is started. Patient under general anesthesia.	HR 40 bpm, sinus bradycardia BP 70/45 mm Hg SpO_2 98% Temp 36.6^{o}C	Discuss differential for change in vitals: Vasovagal episode secondary to stretching/pulling of the tubes, effect of anesthesia, hypovolemia, etc. • Communicate acuity with the surgeon • Treat with Atropine or Ephedrine • Ask surgeon to stop surgical stimulation: surgeon releases the tubes			
PPTL is finished	Vital signs stabilizing. HR 100 bpm BP 100/48 mm Hg SpO_2 98% (intubated) Temp 36.9^{o} C	• Extubation is uneventful			

Appendix 1

Learner Knowledge Assessment
Labor and Delivery Multidisciplinary Team Simulation

Name of simulation: _____________ Date: _____

OB Nursing Anes

Each item has two components. The "Before the simulation" column (left side) examines your perspective at the beginning of the simulation. The "End of Simulation" column (right side) is to evaluate your perspective at the completion of the simulation.

1. How would you rate your knowledge of barriers for postpartum tubal ligation?

BEFORE THE SIMULATION	END OF SIMULATION
1 2 3 4 5 6 7 Little/none Knowledgeable	1 2 3 4 5 6 7 Little/none Knowledgeable

2. How would you rate your knowledge of anesthetic management of PPTL?

BEFORE THE SIMULATION	END OF SIMULATION
1 2 3 4 5 6 7 Little/none Knowledgeable	1 2 3 4 5 6 7 Little/none Knowledgeable

3. How would you rate your knowledge of risks of failed reactivation of labor epidural for PPTL?

BEFORE THE SIMULATION	END OF SIMULATION
1 2 3 4 5 6 7 Little/none Knowledgeable	1 2 3 4 5 6 7 Little/none Knowledgeable

4. How would you rate your knowledge of general anesthesia for PPTL?

BEFORE THE SIMULATION	END OF SIMULATION
1 2 3 4 5 6 7 Little/none Knowledgeable	1 2 3 4 5 6 7 Little/none Knowledgeable

5. How would you rate your overall confidence when you need to manage PPTL with failed labor epidural?

BEFORE THE SIMULATION	END OF SIMULATION
1 2 3 4 5 6 7 Little/none Knowledgeable	1 2 3 4 5 6 7 Little/none Knowledgeable

Appendix 2

Simulation Activity Evaluation

DATE OF SIMULATION: ____________

OCCUPATION: Consultant PG Yr 1 2 3 4 STUDENT NURSE MIDWIFE OTHER

SPECIALTY:_____________________ YEARS IN PRACTICE: _________

Please rate the following aspects of this training program using the scale listed below:

1 = Poor 2 = Suboptimal 3 = Adequate 4 = Good 5 = Excellent

Use “N/A” if you did not experience or otherwise cannot rate an item

INTRODUCTORY MATERIALS						
Orientation to the simulator	1	2	3	4	5	N/A
PHYSICAL SPACE						
Realism of the simulator space	1	2	3	4	5	N/A
EQUIPMENT						
Satisfaction with the mannequin	1	2	3	4	5	N/A
SCENARIOS						
Realism of the scenarios	1	2	3	4	5	N/A
Ability of the scenarios to test technical skills	1	2	3	4	5	N/A
Ability of the scenarios to test behavioral skills	1	2	3	4	5	N/A
Overall quality of the debriefings	1	2	3	4	5	N/A
DID YOU FIND THIS USEFUL?						
To improve your clinical practice?	1	2	3	4	5	N/A
To improve your teamwork skills?	1	2	3	4	5	N/A
To improve your VERBAL communication?	1	2	3	4	5	N/A
To improve your NONVERBAL communication?	1	2	3	4	5	N/A
FACULTY						
Quality of instructors	1	2	3	4	5	N/A
Simulation as a teaching method	1	2	3	4	5	N/A

COMMENTS/SUGGESTIONS:

References:

1. Committee on Health Care for Underserved Women: Committee opinion no. 530: access to postpartum sterilization. *Obstet Gynecol.* 2017;120(1):212–5.
2. Richardson MG, Hall SJ, Zuckerwise LC. Postpartum Tubal Sterilization: Making the Case for Urgency. Anesth Analg. 2018 Apr;126(4):1225-1231.
3. Goodman EJ, Dumas SD: The rate of successful reactivation of labor epidural catheters for postpartum tubal ligation surgery. *Reg Anesth Pain Med.* 1998;23(3):258–61.