

Case of Perineal Laceration

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Introduction:

Perineal trauma is a common complication of vaginal birth. Lacerations can occur spontaneously or iatrogenically, as with an episiotomy, on the perineum, cervix, vagina, and vulva. Perineal lacerations affect 53–79% of women during childbirth, of which 3.1% are severe perineal lacerations. The perineal body contains the superficial and deep muscles of the perineal membrane and is the most common site of laceration during childbirth. Perineal lacerations are divided into four categories of varying severity. First-degree includes superficial injury to the vaginal mucosa and may involve perineal skin. The second degree involves the vaginal mucosa and perineal body. The third degree involves the anal sphincter. Finally, fourth-degree lacerations extend up to the rectal mucosa¹.

Risk factors for perineal lacerations include nulliparity, operative vaginal delivery, midline episiotomy, Asian race, increased fetal weight, malpresentation, and advanced gestational age. Perineal lacerations may result in various complications including acute bleeding that can be life-threatening unless addressed rapidly. Common long-term problems are dyspareunia, perineal pain, and flatal/fecal incontinence². The most severe form of bleeding is a retroperitoneal hematoma, which can be concealed following the laceration of the uterine artery. The symptoms depend on the size of the hematoma and the rate at which it forms. Progressive tachycardia and hypotension may be the first signs. Other symptoms and signs may include lower abdominal pain, a tender mass above the inguinal ligament, and vaginal bleeding that is out of proportion with the hypotension noted. Urinary symptoms like retention and hematuria may also occur. In obesity, it may be challenging to detect due to difficulties in examining the abdomen, so a high index of clinical suspicion is needed.

Complex lacerations may need repair in the operating room by experienced obstetricians under appropriate anesthesia. Anesthetic choice and technique will vary depending on the type of repair needed for the laceration. Simple repairs may be done under infiltration with local anesthetic and intravenous opioids while repair of a severe laceration may require surgical anesthetics like neuraxial or general anesthesia. Pudendal nerve blocks are not always feasible due to the anatomic distortion after a severe laceration. It must be kept in mind that significant hypovolemia might prevent the clinician from performing or extending neuraxial anesthesia. Epidural or spinal anesthesia are both adequate choices for the anesthetic on an extensive repair. In some situations, general anesthesia might be more appropriate depending on the extent of the bleeding and hemodynamics. General anesthesia would be the superior choice if an exploratory laparotomy is needed to evacuate a retroperitoneal hematoma. Care must also be taken when evaluating proper access to perform intravascular resuscitation. Massive transfusion, although rare, might be needed³.

Educational Rationale: To identify patients at risk for potential perineal lacerations and provide adequate anesthetic management for acute bleeding associated with the condition in the immediate post-partum period.

Target Audiences: Obstetric Anesthesiology Providers, Obstetric Anesthesiology Fellows, Anesthesia Residents, Obstetric Providers, Nursing Team

Learning Objectives: As per Accreditation Council for Graduate Medical Education (ACGME)

Core Competencies

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

- **Medical knowledge:** Recall different types of perineal lacerations. Recognize the signs, symptoms, and management of severe bleeding following a perineal laceration. Recognize coagulopathy as a possible complication of perineal lacerations.
- **Patient care:** Evaluate and recognize the severity of a perineal laceration and formulate a safe anesthetic plan according to the stability of the clinical situation. Apply a systematic approach to assessing and treating bleeding.
- **Practice-based learning and improvement:** Identify equipment and skills to manage a patient with a significant perineal laceration. Develop the plan of care focusing on the potential for immediate and long-term implications of the condition.
- **Interpersonal and communication skills:** Utilize effective communication between teams using active and closed-loop communication.
- **Professionalism:** Maintain a professional and effective environment in an unexpected situation amongst a multidisciplinary team.
- **Systems-based practice:** Include a multidisciplinary approach in recognizing and managing complications of perineal lacerations and the proper preparation for unexpected hemodynamic instability. Identify existing barriers within the system that need to change in order to improve patient outcomes.

Questions to ask after the scenario:

1. What are the potential complications of perineal lacerations?
2. What are the clinical signs and symptoms that the perineal laceration requires surgical intervention?
3. How was the response to the situation managed?
4. Were any barriers identified when caring for this patient?
5. How should the anesthetic plan be tailored to a patient that has potential PPH after a perineal laceration?
6. What are the indicators of a patient that requires blood products?
7. What type of access is required to manage an intra-operative case of laceration repair?
8. What type of post-partum monitoring should a patient that just underwent a laceration repair have?
9. What are the post-operative analgesic considerations and options for a patient after perineal laceration repair?

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

- Personnel: Labor and delivery nurse, obstetrician, obstetric anesthesiologist/anesthesiology resident
- Location: Labor and delivery floor setup, Standard obstetric operating room set-up
- Equipment:
 - Pregnant mannequin with epidural catheter in situ
 - Epidural local anesthetics

- Standard monitors: blood pressure, heart rate, pulse oximeter, EKG
- Hemorrhage cart that includes IV catheter kit, arterial line setup, central line, IV fluids
- Intubation supplies, anesthesia machine, standard induction medications
- Resuscitation medications to stabilize the patient's hemodynamics.
- Two units of packed red blood cells

Simulation Scenario Set-up:

Mrs. Jessica Smith is a 37-year-old now G2P2002 s/p vaginal delivery ten minutes prior. Her past medical history includes a remote history of asthma as a child and A2 Gestational Diabetes Mellitus in this pregnancy that is well controlled with insulin.

She was initially admitted for induction of labor at 40w1d and had a prolonged labor of 19 hours. EFW was 4425g (90th percentile), head circumference in the 85th percentile, and abdominal circumference in the 83rd percentile. Immediately post-delivery, she was found to have bleeding in the vaginal area with a laceration inside the vaginal canal involving the perineal body. The estimated blood loss for delivery was 800mL. However, bleeding is still not controlled in the labor and delivery room. Patient was previously comfortable with her epidural. A decision was made to repair the laceration in the OR under anesthesia.

Jessica Smith is a 37-year-old female.

Weight: 108kg Height: 5'3" BMI: 42

Airway Examination: Mallampati III, Full ROM of the neck, Normal dentition

Alert, Oriented x3, no abdominal tenderness

Pre-induction of labor lab results:

-Hgb: 10.1 g/dl, Platelets: 155 x 10⁹/L, Type and screen O+ with no antibodies

Currently has an epidural running ropivacaine 0.2% in continuous mode 12mL/hr, with PCEA of 4mL q 15 min.

The patient has an 18g IV in the right forearm.

Simulation Pre-brief

- The simulation facilitator will assign participants professional roles (at least 1 per discipline):
 - Anesthesiology: Anesthesiology attending/resident
 - Obstetrics: Attending/resident
 - Nursing: Labor and delivery nurse/ OR nurse
- The scenario begins after the anesthesiology provider arrives at the L&D room to assess the patient.

Trigger	Patient Condition	Action	Done	Time	Comments
Patient in the L&D bed	HR 108 bpm BP 94/62 mmHg SPO2 100% Resp 18/min Temp 36.7 C Currently not complaining of any pain. Continued bleeding from perineal laceration.	1. The anesthesiology team initiates plan of care. <ul style="list-style-type: none"> Assess epidural level; T-9 bilaterally. Plan to extend epidural analgesia to anesthesia 2. Recognition of patient hemodynamics <ul style="list-style-type: none"> Consider crystalloid bolus Consider a vasopressor infusion if needed 3. Assess the severity of the bleeding. <ul style="list-style-type: none"> Mild bleeding at about 10 mL/min 			
Patient was moved to the stretcher and taken to the OR. Obstetric team is working on controlling the bleeding and packing the wound.	HR 112 bpm BP 97/71 mm Hg SPO2 99% (air) Resp 17/min Bleeding steady for now.	1. Consider getting additional large bore IV access. 2. Continue to bolus epidural catheter with about 15 mL of lidocaine 2% with epinephrine in incremental doses <ul style="list-style-type: none"> Assess level- Block appropriate, patient comfortable. Level of T-7 bilaterally. Verify that patient has active type and screen. 			
Repair starts, but bleeding worsens.	HR 132 bpm BP 75/50 mm Hg SpO2 97% Resp 17/min Temp 36.9°C Patient complaining of nausea and dizziness. If labs sent:	1. Recognize continuing acute blood loss <ul style="list-style-type: none"> Consider starting vasopressor infusion Open crystalloid IV fluids on large bore IV. Call for 2 units of pRBCs and start transfusion when blood is available if still unstable. 2. Consider starting an arterial			

	<p>Hgb 7.2 g/dl Plts 132 x 10⁹/L</p> <p>VBG: pH: 7.36 pCO₂: 38 mmHg pO₂: 45 mmHg HCO₃: 22 mmol/L BE: -2.3 mmol/L sO₂: 62 % Na+: 137 mmol/L K+: 4.1 mmol/L Ca+: 3.8 mg/dL Glu: 102 mg/dL Lac: 2.2 mmol/L</p> <p>Coagulation: PT: 12.1 s PTT: 35 s INR: 1.1 Fibrinogen: 346 mg/dL</p> <p>After 1 unit of blood is started, HR can begin to slowly trend down.</p>	<p>line.</p> <p>3. Send arterial blood gas and platelets or CBC and electrolytes. Consider checking coagulation via ROTEM/TEG if available.</p> <p>4. Consider 1 gram of tranexamic acid after TEG results show increased fibrinolysis.</p> <p>5. Consider general anesthesia at this point. Prepare standard induction medications. If intubating, perform RSI and intubate with a video laryngoscope.</p>			
<p>40 min later, obstetricians finish the procedure.</p> <p>QBL= 1,900 mL</p> <p>Patient to be moved to stretcher and taken to recovery.</p>	<p>HR 78 bpm BP 108/72 mm Hg SpO₂ 100% Resp 14/min Temp 36.1°C</p> <p>Scenario ends after discussion of post-operative plan.</p>	<ol style="list-style-type: none"> 1. If GA was performed, safe to extubate patient. 2. Discuss post-operative analgesic plan. Consider 2.5 mg epidural duramorph. 3. Consider decision to keep epidural in, until coagulation labs ordered and confirmed to be normal. 			

Appendix 3.

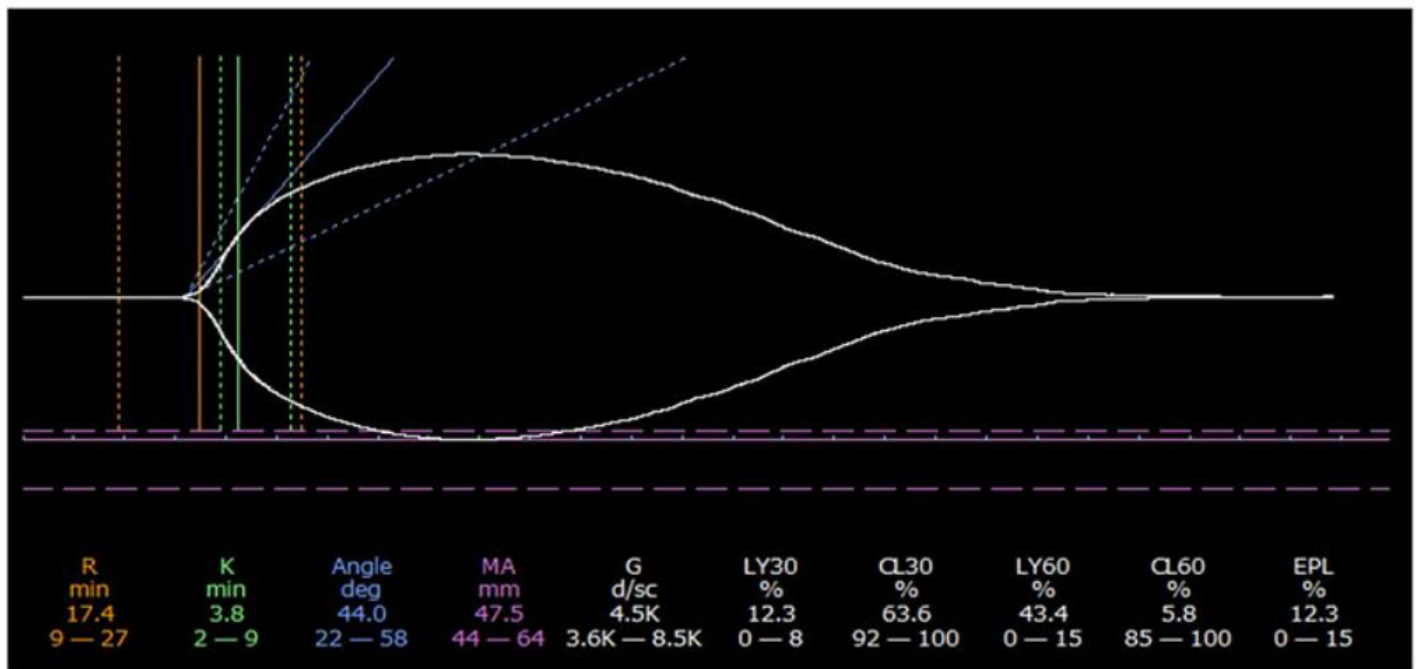


Figure 1. TEG Results show high LY30 and LY60 consistent with fibrinolysis.

References

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