When Uncomplicated Childbirth Causes Permanent Nerve Damage:
A Case Study with Patient and Provider Implications

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LENI:
Lower Extremity Nerve Injury in Childbirth

Learning Objectives
1. Describe lower extremity nerve injury (LENI) during childbirth:
   - etiology, presentation, and duration.
2. Identify strategies to prevent LENI during 2nd stage labor.
3. Recognize signs and symptoms of LENI.
4. Identify post-partum interventions, treatment options and patient resources.
Case Study

- 31-yr old patient
- Spontaneous labor 2200
- Epidural 0200
- Pushing (2nd stage) begins 0520 x 3.5-4 hours in lithotomy position
- Uncomplicated vaginal birth of 7lb1oz baby girl
- 8H post delivery, pt % complete paralysis left leg.
- 24H post delivery, complete numbness and paralysis left leg, and paresthesia right leg

Sequence of Events

- 28-Hrs: Anesthesia concludes “stunned femoral nerve” from positioning
- 48-Hrs: Patient unable to bear weight on left leg, only ambulate w/ a walker.
- 52-Hrs: DC with no diagnosis, no physician consults, no PT evaluation.
- Discharge plan: No resources or treatment plan
- At home, patient cannot safely care for newborn

My view from home
What was next for me?

“What unfortunately lots of Googling…plus tears”

- Facebook Support Group:
  “Moms With Femoral/Peroneal/Sciatic Nerve Damage from Labor/Delivery”

- Family Support

- Started physical therapy within 2 weeks after birth, solely from resources found in FB group

Incidence of LENI

- Incidence of LENI is roughly the same as
  - Shoulder dystocia (0.2-3.3%)
  - Postpartum venous thrombosis (0.05-0.2%)
  - Postpartum hemorrhage (3%)

- Sadly, I’m not alone
- Approximately 0.3%-2.3% (reported) of births

Affected Moms Around the World

- Affected Moms from Around the World

FAQs

- What is Lower Extremity Nerve Injury (LENI)?
- How common is LENI?
- What are the symptoms of LENI?
- How is LENI treated?
- Is there a long-term outcome for affected mothers and infants?
Types of Childbirth-Related LENI

1. Femoral nerve injury:
   - Loss of motor strength/function in lower extremity (primarily quad and knee).

2. Lateral femoral cutaneous nerve injury:
   - “Meralgia paresthetica”
   - Loss of sensation mid-thigh to mid-calf.
   - No motor component but may have pain.

3. Peroneal (fibular) nerve injury:
   - Foot drop.

4. Sciatic nerve injury:
   - Burning/tingling down leg
   - Weakness, numbness or difficulty moving leg or foot

Childbirth Related Nerve Injuries

- **Involvement**: Vast majority impact femoral nerve & peroneal nerves.
- **Injuries**: sensory, motor or mixed sensory-motor deficits.
- **Highest risk**: 1) nulliparous; 2) prolonged second stage.
- **Frequently occurring** with use of regional labor analgesia.
- **Highest risk**: 1) nulliparous; 2) prolonged second stage.
- **Frequently occurring** with use of regional labor analgesia.
- All are immediately evident following “recovery” from anesthesia.
- All increase the incidence of falls, during hospital stay, in-home or assisted living arrangements, and postpartum depression.
- **Most resolve**: yielding 75% or greater return in function after intensive treatment (6 months to 1 year).
- **Many women experience permanent injuries** ranging from foot drop, to mild weakness in affected extremity(s), to complete immobility and wheelchair confinement.
**Etiology:**

\[ \text{Compression} + \text{Stretch} \times \text{Time} = \text{Injury} \]

- Stretch, compression or vascular (ischemia) injury of the femoral nerve.
- Hyper-flexed thighs compress the femoral nerve under the inguinal ligament.
- Rarely occurs during cesarean birth (may occur with stretching or pressure with retractors/vacuum).

- Peroneal (fibular) ischemic nerve injury
- Hand placement in second stage.

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**Neuro/Skeletal- Anatomy of the Pelvis**

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**Lateral Cutaneous**

**Femoral Nerve**

**Artery**

**Vein**

Compression of vascular structures can lead to nerve and tissue ischemia, as well as have an impact on blood pressure.
Hyper-flexed positions
- Hip flexion greater than 90 degrees

Prolonged positioning increases risk of nerve injury

Ideal Positions:
Hip flexions ≤ 90°, or feet resting on bed

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Positions: Excessive Abduction of Thighs
“Frog Leg”

- Should not be maintained for prolonged periods of time
- Legs should be supported in a “recovery” position between pushes
  [Midline / < 90° flexion at hips and knees]

Common Peroneal (Fibular) Nerve
A division of the Sciatic Nerve

❖ Superficial peroneal
   *Deep peroneal
Common Peroneal (Fibular) Nerve
A division of the Sciatic Nerve

❖ Deep peroneal
  ❖ Motor function
  ❖ Foot dorsiflexion
  ❖ Toe extension

❖ Superficial peroneal
  ❖ Motor function
  ❖ Foot eversion

Image purchased from KenHub.com
Common Peroneal (Fibular) Nerve Injuries

Mechanisms of injury:
❖ Prolonged pushing with patient's hands applying pressure over or near the fibular head (knee cap).
❖ Prolonged "digging" or deep compression pressure along posterior thigh.
❖ Squatting or kneeling for prolonged periods

BEST PRACTICE RECOMMENDATION:
MOVE POSITIONS AT LEAST EVERY 10-15 MINUTES

Ideal Hand Positioning while Pushing

Potential for nerve injury in the OR

Nursing Implications: Second Stage Management

❖ Avoid prolonged active pushing. Allow patients to labor down.
❖ Don’t push in stirrups. Reserve stirrups only for delivery.
❖ Avoid prolonged flexion or hyperflexion of hips during pushing.
❖ Change leg/hand positions frequently during pushing, EVERY 10-15 MIN.
❖ Place legs back down in bed after pushing attempts.
❖ Place patients legs in stirrups
❖ Hip flexion should not exceed 90 degrees
❖ Avoid prolonged “grasping” of hands over the lateral aspect of the knees.
❖ Avoid prolonged “digging”/deep compression by fingertips on the posterior aspect of the thighs.
Challenges Faced in Research

- **Under recognized**
  - patients and staff unaware or unable recognize symptoms

- **Under reported**
  - patients symptoms are minimized or resolve within short duration

- **Under treated**
  - providers lack understanding and/or awareness of the pathophysiology of injury, treatment options, and available resources.

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Letter written in response to the Practice Guideline published in early 2020

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LENI: Nursing Implications

DO NOT force the patient to stand up or tell them "you will start to feel your leg/foot when you stand up".

LENI: Nursing Implications

❖ Be an advocate - be alert to patient complaints of lingering numbness or weakness in lower extremities
❖ don’t belittle or minimize feelings or fears
❖ don’t assume sleepy nerve or slow epidural
❖ sensitive to postpartum hormones, pain, sleep deprivation, newborn, possible other complications
❖ take action and advocate for answers early
❖ Anesthesia Assessment
❖ Rule out complications or reactions from epidural
❖ Notify anesthesia early. Be persistent!
❖ Neurology Consult
❖ MRI/CT - to rule out any other causes or complications
❖ Electromyography (EMG) testing
❖ Nerve Conduction Test
❖ Continued Follow-up

BE AN ADVOCATE
LENI: Nursing Implications

Documentation
❖ Fall risk
  ❖ arm band, falling star, etc.
  ❖ patient/family education
❖ Neuro assessments
  ❖ what movement is possible in affected area
  ❖ what part of limb is numb/tingly/painful/swollen/etc.
❖ General mobility assessments
  ❖ up with assistance
  ❖ unable to ambulate
  ❖ assistive device in use:
    ❖ walker, wheelchair, etc.

LENI: Nursing Implications
❖ Physical Therapy Evaluation
❖ Assistive Equipment (walker, wheelchair)
  ❖ shower chair
  ❖ walker
  ❖ wheelchair
  ❖ AFO brace for foot drop
❖ Ability to safely adapt to injury
  ❖ safety of baby in mind
  ❖ transfers of bed, shower, chairs, car, etc.
❖ Physical Therapy Plan after Discharge
  ❖ setting up physical therapy intensive treatment
  ❖ outpatient vs in-home

LENI: Nursing Implications
❖ OT Evaluation for Home safety
  ❖ family support and availability
    ❖ carry newborn
    ❖ driving, meals, Dr. appts, ADL’s, etc.
  ❖ Evaluate home environment
    ❖ increased fall risks (stairs, rugs, steps, etc.)
    ❖ Safety and fall risk prevention strategies at home.
  ❖ Equipment needs long term
    ❖ Toilet riser or bars
    ❖ Shower rail
Facebook Group

- 1700 women, with new women added weekly
- Includes women from 38 different countries
- Ranges from women that have healed within a few weeks to those that have never fully healed

Let's make the wheelchair ride with their newborn a courtesy ... not a necessity.
Selected References