Neuropathic Pain: Pudendal Nerve Block

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Introduction

The second stage of labor is related to both uterine pain (T10-L1), as well as birth canal pain which is supplied by the pudendal nerves (S2-S4). Prior it epidural anesthesia, the block was preferred for second stage of delivery to relieve pain from introital distension and perineal repair. (when fetus is in birth canal it is mostly somatic pain supplied by pudendal nerve).

- Used for chronic pelvic pain secondary to pudendal neuralgia

Anatomy

- The pudendal nerve is a mixed sensory-motor nerve, which originates from the spinal rami of spinal nerves, **S2-S4** (Fig. 61.1).
- The nerve exits through the greater sciatic foramen, below the sacrospinous ligament. It reenters the pelvic cavity through the lesser sciatic foramen, coursing above the sacrotuberous ligament.
- The pudendal nerve courses intimately with the pudendal artery and vein and lies medially to the pudendal vessels.
- After entering the pudendal or "Alcock's" canal, the nerve gives off two branches—the **inferior rectal nerve** and the **perineal nerve.** The pudendal nerve then continues to course through the perineum as the **dorsal nerve**, which provides sensory innervation to the **penis** and **clitoris**.
- The inferior rectal nerve provides sensory input to the **perianal skin** and motor input to the **external anal sphincter.**
- The perineal nerve branches off into the superficial perineal and deep perineal branches. The perineal nerve provides motor input to the **levator ani, bulbospongiosus and ischiocavernous** muscles and provides sensory innervation to the **scrotum** in males and **labia majora** in females.

Indications

- Obstetric procedures
  - Second stage of labor
  - Perineal laceration or episiotomy
  - Hemorrhoidectomy

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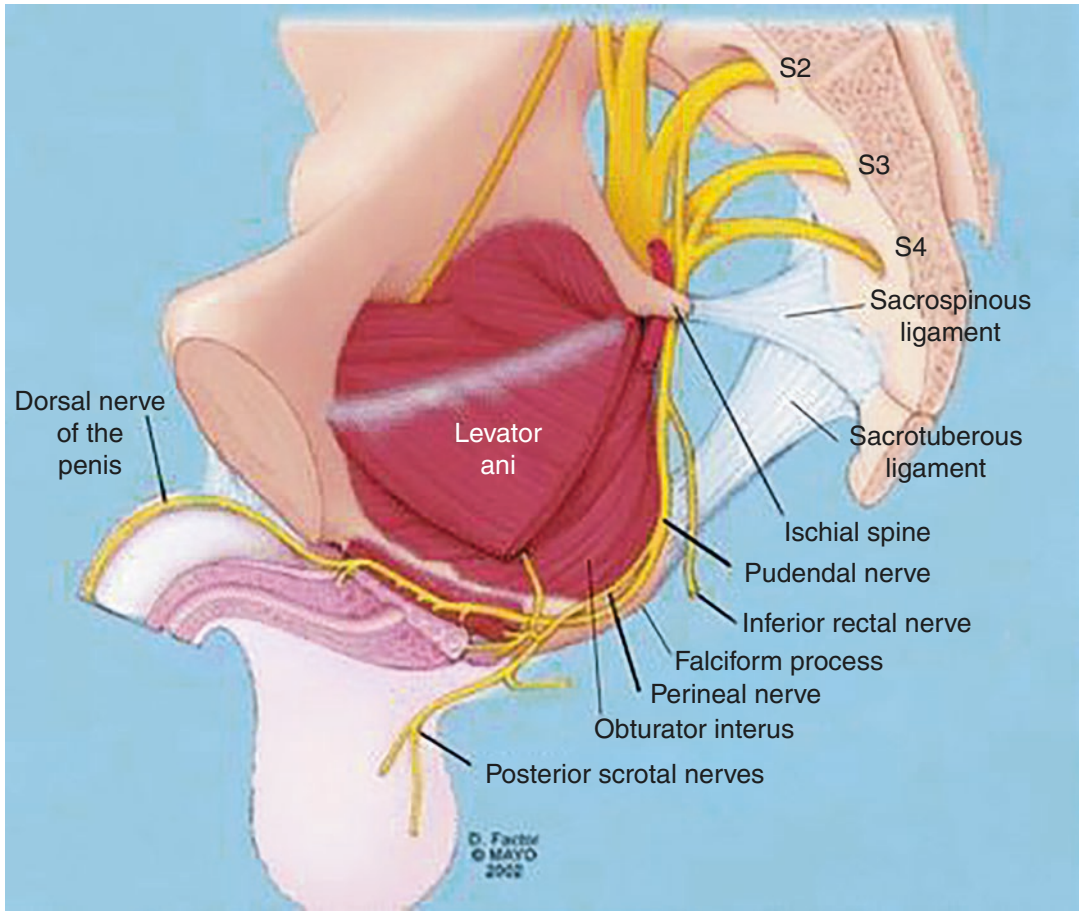

Fig. 61.1 Schematic anatomy of the intrapelvic path of the pudendal nerve. (From Popeney et al. [6]. Reprinted with permission from John Wiley and Sons and used with permission of Mayo Foundation for Medical Education and Research. All rights reserved; Reproduced with permission from Mayo Clinic foundation)

- Urologic procedures
  - Transurethral prostatectomy
  - Transrectal prostate biopsy
- Pudendal neuralgia: characterized by [1] pain in the anatomical territory of the pudendal nerve; [2] worsened by sitting; [3] the patient is not woken at night by the pain; [4] no objective sensory loss on clinical examination; [5] positive anesthetic pudendal nerve block.

Approaches to the Pudendal Nerve Block

Transvaginal Approach

- This is the most common approach for obstetric procedures, with the patient in the **lithotomy** position.

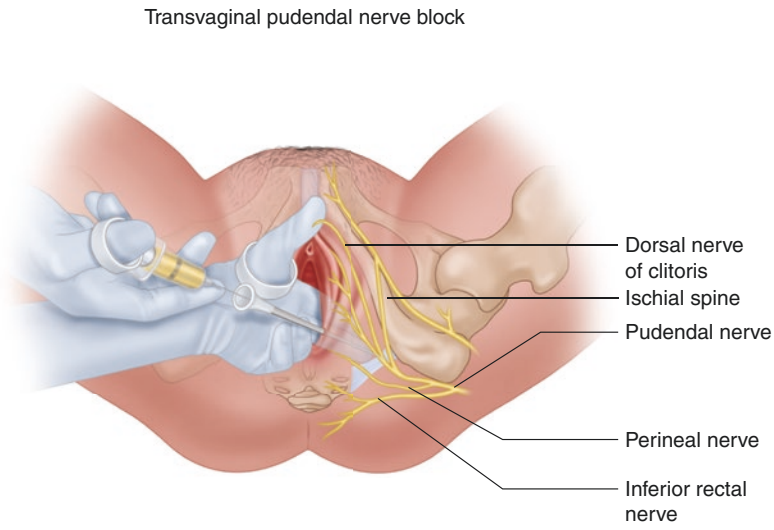

Fig. 61.2 Transvaginal pudendal nerve block. (Reference: Rapkin [3]. Additional helpful images for illustrator: 1. https://www.aafp.org/afp/2012/0301/p447.html. 2. https://www.familygp.online/pudendal-block-2/)

- The first step involves identifying the **ischial spine** through the lateral vaginal wall (Fig. 61.2).
- Using a long needle, the sacrospinous ligament is punctured, and advanced 1 cm below the ischial spine.
- Following negative aspiration, the anesthestic (**lidocaine 1%** or **bupivacaine 0.25%**) is injected posterior to the ischial spine.
- Perform a sensory test (**pinprick**) in the ano-genital region to ensure adequate coverage.

Xray Guidance

- The patient is placed in the prone position on the procedure room table.
- AP fluoroscopic guidance was used to visualize pelvic inlet (at the level of the two femoral heads). The falciform process (the ischial spine) is then highlighted by 5- to 15-degree ipsilateral oblique angulation of the fluoroscope.

After 1% lidocaine infiltration using a 25 gauge 1.5 inch needle, a 25-gauge 3.5 inch needle is advanced to the tip of the ischial spine, where the pudendal nerve transiently leaves the pelvis (Fig. 61.3). After negative aspiration for heme, 5 mL of bupivacaine 0.25% is injected. (Pain Physician. 2004;7:319-322).

Fig. 61.3 Xray guided pudendal nerve block. (Reproduced with permission from: A novel technique for pudendal nerve block. Pain Physician. 2004;7(3): 319–22. (PMID: 16858468))

Clinical Pearls

1. Pudendal nerve block can be used for patients with pudendal neuralgia, gynecological procedures (second stage of labor, perineal laceration, episiotomy), hemorrhoidectomy, and various urological procedures (e.g, transurethral biopsy).
2. The pudendal nerve is a mixed sensory-motor nerve, which originates from the spinal rami

of spinal nerves, S2-S4. It provides sensory innervation to the skin of the perineum and mucosa of the anal canal and motor function of external anal sphincter, urethral sphincter, and perineal musculature.

3. knowledge of the nerve's close **proximity to ischial spine** is important when performing blocks either blind or image-guided approaches.
4. Nantes criteria have been proposed for diagnoses of pudendal neuralgia. Pudendal nerve block satisfy one of the nantes criteria.

Questions

1. Which of the following indications warrants a pudendal nerve block?
   A. First stage of labor
   B. Cesarean delivery
   C. Cystectomy
   D. Episiotomy
2. The pudendal nerve arises from which of the following nerve roots?
   A. L2-L4
   B. L4-L5
   C. S1-S2
   D. S2-S4
3. A 12-month-old boy presents for revision circumcision in the urology office. As the anesthesia resident, you plan on placing a nerve block for adequate anesthesia. Which of the following correctly describe the innervation of the penis?
   A. The iliohypogastric provides sensory innervation to the root of the penis.
   B. The dorsal penile nerve separates into two branches at the level of the pubic symphysis
   C. The dorsal penile nerve arises from the perineal nerve branch of the pudendal nerve.
   D. The pudendal nerve arises from the L2-L4 nerve roots
4. Twenty-four hours following vaginal delivery, a patient begins to report tingling around the lateral aspect of her thigh. Which of the following most likely led to this complication:
   A. Pudendal nerve block
   B. Epidural anesthesia
   C. Lithotomy Positioning
   D. Spinal anesthesia
5. One of your patients is extremely anxious about her upcoming pudendal nerve block and asks you for the most common symptoms. You let her know that the most common complication is:
   A. Bladder laceration
   B. Injection site infection
   C. Vaginal discomfort
   D. Bleeding

Answers

1. D, 2. D, 3. B, 4. C, 5. C

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Further Reading

Atlas of pain medicine procedures, Chapter 62: Pudendal nerve block; OB/GYN Hospital medicine, Chapter 69: Pudendal nerve blocks.