



HOPE Newsletter

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Pudendal neuralgia and injection therapy

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The pudendal nerve is a nerve in the pelvic region. It originates in the sacral plexus (ventral rami of the second, third and fourth sacral nerves). The pudendal nerve innervates the external genitalia and sphincters of the bladder and the rectum. It passes between the piriformis and coccygeus muscles, and leaves the pelvis through the lower part of the greater sciatic foramen. It crosses the spine of the ischium, and reenters the pelvis through the lesser sciatic foramen. The pudendal nerve gives off the inferior rectal nerves. Then the pudendal nerve divides into two terminal branches: the perineal nerve, and the dorsal nerve of the penis (in males) or the dorsal nerve of the clitoris (in females).

Based on the anatomy, the injection can be accurately performed under fluoroscopic guidance.

Here we induce the techniques of pudendal nerve block and other injections for chronic pelvic pain.

1. Pudendal nerve block under fluoroscopic guidance: the patient lies on his or her belly, and is given intravenous sedation (if necessary) during the procedure. After sterile prep, a fluoroscopy is used to identify the bony mark where the pudendal nerve passes through (figure 1). The skin for injection insertion is marked and injected with local anesthetics. Then a



Figure1 Pudendal nerve block

spinal needle is inserted towards the bony mark (the tip of the ischial spine). Once the needle is contacting the bone, the needle is moved back slightly and reinserted towards the distal ischia spine. The needle may reproduce pain by contacting the pudendal nerve. After negative aspiration of blood, one milliliter of contrast dye is injected to confirm an appropriate injection. Then 5 milliliters of long-acting local anesthetics with steroid is injected to block the pudendal nerve.

If the pudendal nerve block provides greater than 50% of pain reduction, the patient will be the candidate of radiofrequency neurolysis therapy. This procedure is similar to the injection therapy, but instead of injecting pain medication; a special heating needle is inserted to heat the nerve in order to achieve a long-term pain relief.

2. Ganglion impar injection: sympathetic nerve block can also provide pain relief for chronic pelvic or perineal pain. This is because these tissues are supplied by the sympathetic nerve as well. Ganglion impar is a group of sympathetic nerves located in the front of the sacrum and coccyx. Ganglion impar injection can be done with a minimally invasive approach from the patient's tail skin into the sacrococcygeal joint (Figure 2). Once the needle passes the sacrococcygeal joint by 1-2 mm with negative aspiration of blood, 5 milliliters of medication is injected.

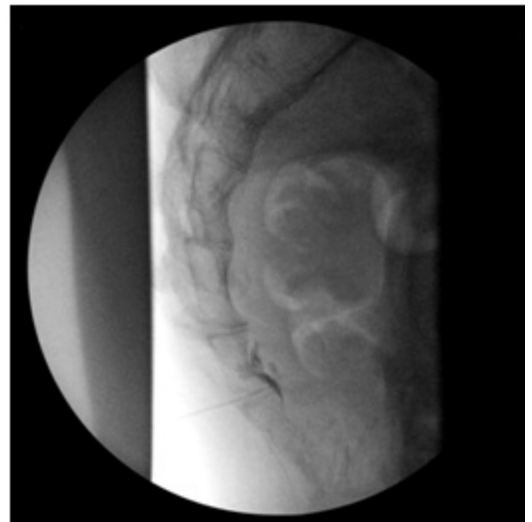


Figure 2 Ganglion impar injection



Figure 3 Hypogastric ganglion injection

3. If chronic pelvic pain is not relieved by the above injections, it can be relieved by blocking the hypogastric ganglions, which are located in the front of L5 and S1 vertebrae. This injection is done by inserting a needle from the side of the patient's back towards the front of L5 and S1 vertebrae under fluoroscopic guidance (Figure 3). Normally hypogastric ganglion injections should be performed on both sides.

If the pain is relieved by ganglion nerve injection, long-term pain relief can be achieved by the injection of phenol or alcohol.

Navigating the Pudendal Nerve Block Maze

By Violet Matthews, BSN, RN

Pudendal nerve blocks are frequently used in the diagnosis and therapeutic treatment of chronic pelvic pain and pudendal neuralgia. Since the pelvis is a complex region of nerves and other anatomical structures, understanding the different nerve block diagnostic and treatment options can be confusing. Many patients approach these procedures with a certain amount of anxiety, not just in fear of the pain involved with the injection, but also with concern that nerve blocks could make them permanently worse. There are various types of nerve blocks available and different techniques used in delivering them, with advantages and disadvantages to each method, including possible complications and risks involved with each.



Violet Matthews, BSN, RN

This article will discuss pudendal nerve blocks, but a list of other types of blocks is also provided here, since it can be challenging to determine which pelvic nerves are involved in chronic pelvic pain syndromes. It is outside the scope of this article to discuss these other types of blocks in depth.

Types of Nerve Blocks

Some of the blocks used in the diagnosis and treatment of chronic pelvic pain include the following:

- caudal epidural block
- transsacral nerve root block
- local infiltrations (small nerve fibers)

Sacral:

- pudendal nerve block¹
- inferior cluneal branch of posterior femoral cutaneous nerve block

Thoracolumbar:

- iliohypogastric block
- ilioinguinal block
- obturator nerve block
- genitofemoral nerve block

Sympathetic:

- ganglion impar block
- superior hypogastric block

Pudendal Nerve Blocks

The pudendal nerve innervates the bladder and anal sphincters, the perineal area, and the genital area. Patients with pain in these areas (referred to in this article as the distribution area of the pudendal nerve) may be candidates for pudendal nerve blocks.^{2, 3}

Typically these blocks are given along the main trunk of the pudendal nerve at the ischial spine, where the nerve passes between the sacrotuberous and sacrospinous ligaments, or in the Alcock's canal.⁴ Some physicians provide blocks to the dorsal branch of the nerve, but there is currently no literature found describing these blocks in the treatment of pudendal neuralgia. Pudendal nerve surgeons often recommend a series of three nerve blocks before considering nerve decompression surgery.^{2, 5, 6}

Nerve blocks may be given with or without sedation, depending on the physician's recommended protocol. Without sedation the procedure may be somewhat painful, but this allows for patient feedback on proper



placement of the injection. An anesthetic medication such as lidocaine or marcaine is used to temporarily numb the nerve, and a steroid medication may be used to decrease inflammation in the area around the nerve. The Nantes team of physicians recommends that the patient's level of pain in different positions, including sitting, should be assessed before and after the procedure to determine the amount of pain relief achieved. The patient should also be assessed after the procedure to determine if the pudendal nerve distribution area became numb, indicating that the medication reached the pudendal nerve.¹

Techniques Used to Deliver Nerve Blocks

Pudendal nerve blocks can be given using different guidance tools including fluoroscopy, MRI imaging, computed tomography (CT), ultrasound guidance, nerve stimulation, or finger guidance. Blocks can be delivered using a transgluteal approach through the buttocks or transvaginally (in females).^{1, 7}

Fluoroscopy uses X-rays to obtain moving images on a screen. Advantages: It is simple; no heavy equipment is needed. Disadvantages: It can be used for blocks at the ischial spine but not the Alcock's canal; some radiation is involved; there is possible risk of organ perforation.^{1, 5}

CT guidance uses computer processed x-rays to obtain images of slices of part of the body. This method can be used for blocks at the ischial spine and Alcock's canal. Advantages: It is considered the "gold standard" with confirmation of needle placement and best visualization, especially for Alcock's canal. Disadvantages: It uses the most radiation of all the methods; there is heavy equipment involved; a possible allergic reaction can result if contrast dye is used.^{1, 5} The injection can be given without contrast dye if necessary.

Ultrasound guidance uses high frequency sound waves to create images of internal structures of the body. Advantages: It is fast; there is no radiation; no heavy equipment is involved. Disadvantages: There is difficulty visualizing the Alcock's canal; it is difficult on obese patients.^{1, 5}

MRI or MRN involves a combination of magnets and radio waves to produce images of internal structures. Advantages: There is no radiation; there is good visualization. Disadvantages: It cannot be used if the patient has any metal implants; it requires heavy equipment.⁸

Nerve stimulation uses a low intensity short electrical stimulus that causes a muscle to twitch, providing some validation of needle placement at the correct nerve. Anatomic landmarks can be used in conjunction with electrostimulation. Advantages: There is no radiation; no heavy equipment is required. Disadvantages: It is difficult to know the exact placement of the needle in the Alcock's canal; there is possible risk of organ perforation.^{1, 5}

Finger guidance via the rectum or vagina relies on palpating bony landmarks and patient feedback during the procedure.⁹ Advantages: It is inexpensive; no equipment or radiation is involved. Disadvantages: It is difficult to know the exact placement of the needle; there is possible risk of organ perforation.

Interpretation of Results of Blocks

If the pudendal nerve distribution area becomes numb with loss of sensation and there is immediate pain relief, the block may be diagnostic for pudendal neuralgia. If there is no numbness or loss of sensation in the pudendal nerve distribution area, it is questionable as to whether the medication reached the pudendal nerve, and no conclusion can be drawn as to the result of the block.¹

"If there is immediate pain relief, the block may be diagnostic for pudendal neuralgia."

If a nerve block numbs the pudendal nerve distribution area and provides immediate 50% reduction in pain, the block is considered diagnostic for pudendal neuralgia. However the diagnosis is not considered 100% accurate since there are other nerves nearby, and the medication injected may affect those nerves. Since there are variations in anatomy for each patient, even though a block may have been targeted at the landmarks that are typically correct, a patient may have a branch of the nerve that comes off proximal or distal to that target.^{1, 10, 11}

In some patients pudendal nerve blocks do not relieve genital or anal pain, even though anesthesia causing numbness is achieved in the distribution area of the pudendal nerve. In those cases, it is possible the pain is sympathetically maintained, and it could be useful to try a hypogastric plexus block or a ganglion impar block.¹²

Nerve Block Treatments that May Provide Permanent or Semi-Permanent Relief

Some types of nerve blocks that are neurodestructive can be used on sensory nerves such as the genitofemoral or on sympathetic chain ganglion such as the impar ganglion.

Phenol or alcohol: These are chemical agents that destroy the nerve and may have to be repeated depending on whether the nerve bodies are completely destroyed. These agents are generally used only on sensory nerves, not motor nerves. Phenol and alcohol are not used in pudendal nerve blocks, since the pudendal nerve contains both motor and sensory fibers.¹³



Cryoablation: This procedure, in which a pressurized gas is used to "freeze" the nerve, can be effective in pain relief for sensory nerves. The effectiveness is dependent on several variables including the temperature and duration of the freezing. Trescot describes the use of this procedure for pudendal neuralgia and advises that cryoneurolysis of the pudendal nerve at the ischial spine will lead to "profound hypoalgesia." The pudendal nerve is a motor as well as a sensory nerve, and there are no cases of pudendal nerve cryoablation found in the literature, possibly due to the almost certain risk of patients becoming incontinent and losing penile or clitoral sensation.¹⁴

Continuous radiofrequency ablation (CRF): In CRF the goal is to create a lesion on the nerve that will block the transmission of pain signals. A needle electrode is heated to 65-70 degrees centigrade and applied for at least 60-90 seconds. This therapy is not recommended for mixed motor and sensory nerves such as the pudendal nerve, since both motor and sensory fibers may be destroyed. The effects can last for years, depending on how long it takes for the nerve to regenerate.¹⁵

Pulsed radiofrequency ablation (PRF): In PRF ablation the goal is to stun the nerve without creating a lesion. The maximum temperature is 42 degrees centigrade, and the heat is applied in 20 millisecond pulses for 120 seconds. The exact mechanism of action is not entirely understood, but neuromodulation of the nerve cells is thought to take place without destruction of the cells. PRF ablation to ilioinguinal and genitofemoral nerves has provided pain relief for up to six months.¹³

Rhame et al. (2009) reported one case of successful pudendal nerve PRF ablation in a woman who first had temporary relief from two pudendal nerve blocks and then underwent successful PRF treatment of the pudendal nerve. Pain relief continued to be significant one and a half years after the procedure.¹⁶

The risks of CRF ablation and PRF ablation include possible infection, bleeding, accidental burning of nearby structures such as blood vessels or nerves, and possible ineffective treatment or worsening of symptoms. PRF ablation has relatively few complications related to the radiofrequency current, as compared to CRF ablation.¹³

Complications of Pudendal Nerve Blocks

No major permanent complications from pudendal nerve blocks are reported in the published literature. Minor complications that have been reported include bruising, temporary worsening of pain, temporary sciatic nerve block, and temporary bowel or bladder incontinence.^{1, 4}

Possible theoretical complications listed in the literature include infection, hematoma from vascular puncture, gastrointestinal perforation, and falls from inadvertent sciatic nerve block.¹ Thoumas et al. (1999) published that no complications were experienced in 200 CT guided pudendal nerve block procedures.¹⁷

Although there are no major complications reported in the literature, patients who post anecdotally on the Pudendalhope public forum occasionally report a long-term, unresolved worsening of symptoms associated with pudendal nerve blocks. One case of four years of unrelenting unresolved persistent genital arousal disorder (PGAD) has been reported as a result of a series of two steroid pudendal nerve blocks. Another case of six months of unresolved PGAD has been reported, beginning immediately after analgesic infiltrations into the vulva area. Two cases of unresolved severe increased pain with sitting have been reported after bilateral pudendal nerve injections. Other patients have reported permanent worsening of symptoms from pudendal nerve blocks without stating the details of which symptoms became worse. Understandably, these complications from nerve blocks have been devastating to the patients involved.

"It is imperative that physicians warn their patients of the possible risks associated with nerve block."

Studies on Efficacy of Blocks

There are few studies on the long-term benefits of pudendal nerve blocks.

In a 1997 publication, Amarenco et al. reported that in 170 cases of pudendal nerve blocks, 15% had good results after one year.¹⁸

Robert et al. (1998) stated that, "Treatment by X-ray or scanner guided infiltrations cured 65-70% of the patients"; however, no length of time or statistical details were given, suggesting that this may have been an estimate. According to Weiss, an earlier study by Robert, in which only two percent were improved after two months, was more consistent with Amarenco's findings and Weiss's own experience.⁹

In an Italian study of 27 women, 92% had a 20% improvement in quality of life at 12 months after pudendal nerve blocks. It is unknown whether the women received other therapies that might have improved their pain during the 12 months.¹⁹

Hough et al. (2003) found that 65% of their patients obtained short-term relief from pudendal nerve blocks. No long-term data was available.⁴

McDonald and Rapkin reported in a study of 36 women with generalized vulvodynia, a "moderately encouraging treatment response with significant improvement in pain" at the two to three month follow-up after a series of five multilevel injections (caudal epidural, pudendal nerve block, and transperineal vulvar infiltration).²⁰

Lean, Hegarty, and Harmon published on pain and symptom relief in two patients with interstitial cystitis, who each received an ultrasound guided pudendal nerve block. One patient had continued improvement after three months, and one patient

"It is unclear what percentage of people experience lasting relief from pudendal nerve blocks."

had continued improvement after nine months.²¹

In research conducted by Vancaillie et al. (2012), 61 of 65 patients had a positive response to transvaginal pudendal nerve blocks. Patients were only followed for 64 hours after the nerve blocks, so no long-term data is available.²²

Antolak and Antolak describe a case of a patient with symptoms of pudendal neuralgia who had three pudendal nerve blocks one month apart. The patient's symptoms reportedly resolved, and the patient remained asymptomatic 32 months after the nerve blocks.²³

Cok et al. (2011) report on two women with pudendal neuralgia who received transsacral S2-S4 nerve blocks instead of "classical" pudendal nerve blocks. Both women reported high pain scores prior to the procedure but obtained immediate relief and were pain-free six months after the blocks.²⁴

Conclusion

It is unclear what percentage of people experience lasting relief from pudendal nerve blocks. The lack of consistent long-term studies showing the efficacy of nerve blocks combined with anecdotal reports from patients, which admittedly is not scientific evidence, may cause anxiety in patients when they are faced with the decision of whether or not to undergo a nerve block. When patients are experiencing intractable pain that is not alleviated by non-invasive treatments, nerve blocks can be a valuable diagnostic and therapeutic tool, especially before deciding whether to undergo pudendal nerve decompression surgery.

Pudendal neuralgia patients appreciate very much the efforts made by physicians to alleviate their pain and they understand that they are a difficult patient population to treat. More studies are needed to determine the long-term benefits and risks of pudendal nerve blocks. In the meantime, it is important for health care providers to keep in mind the recommendation of the Nantes team of physicians, that no more than three steroid pudendal nerve blocks be given in a series, due to the possibility of nerve damage from the steroid.² And finally, it is imperative that physicians warn their patients of the possible risks associated with nerve blocks.

"Pudendal neuralgia patients appreciate very much the efforts made by physicians to alleviate their pain and they understand that they are a difficult patient population to treat."

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