

Fluoroscopy-guided pudendal nerve block and pulsed radiofrequency treatment

— A case report —

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Pudendal nerve block (PNB) is performed for differential diagnosis and treatment of chronic pelvic and perineal pain. Several block methods, such as transvaginal, transperineal, computerized tomography-, ultrasound- and fluoroscopy-guided approach are currently under practice. Compared to others, a fluoroscopy-guided approach has several advantages, such as its relatively low cost, facility and ease of landmark recognition. We depicted a fluoroscopy-guided PNB technique to selectively block and elaborate a pulsed radiofrequency treatment in a 51-year-old man with chronic pelvic and perineal pain. The patient had undergone a ganglion of impar block with a limited pain relief. Thereafter, a PNB was performed and the pain was relieved significantly for 2 weeks. Further PNB with a pulsed radiofrequency treatment reduced the pain for more than 8 weeks. The pain relief sustained up to the time of this report. The fluoroscopy-guided PNB and pulsed radiofrequency treatment allowed simplicity in manipulation and precision in performing the procedures with a favorable outcome. (*Korean J Anesthesiol* 2009; 56: 605~8)

Key Words: Fluoroscopy, Ischial spine, Pudendal nerve block, Pulsed radiofrequency treatment.

Chronic pelvic and perineal pain is a frequent complaint in patients and can present in various pain syndromes [1]. Although the etiology of this pain can be difficult to ascertain, an interventional procedure may play an important diagnostic and therapeutic role. Considering the potential pudendal nerve involvement in chronic pelvic and perineal pain [2], pudendal nerve block (PNB) can be performed for differential diagnosis and treatment.

The pudendal nerve is a somato-sensory nerve derived from the S2–4 roots. It provides sensory innervations to the anal, perineal, and genital area, and motor supplies to the pelvic floor muscles. Chronic pelvic and perineal pain can develop if the pudendal nerve is entrapped and compressed at the attachment of the sacrospinous ligament to the ischial spine, or in the pudendal canal where the nerve courses rostral to the foramen process [2].

Earliest methods of PNB via transvaginal or transperineal approach have evolved into image-guided block techniques with the introduction of computed tomography (CT) [3], ultrasound [4] and fluoroscopy [5]. Among these image-guided techniques, the fluoroscopy-guided approach has several advantages in clinical practice because of its relatively low cost, facility and ease of landmark recognition [5].

Since there has been no literature on the fluoroscopy-guided pudendal nerve block with a pulsed radiofrequency (PRF) treatment, we report a successful PNB with a PRF treatment under the fluoroscopy-guided technique in a 51-year-old man with chronic pelvic and perineal pain.

CASE REPORT

A 51-year-old man with a history of coccyx injury thirty years ago and a 5 years' duration of diabetes mellitus, visited the pain clinic with chronic pelvic and perineal pain. He admitted to have the pain for 10 years with a progressive aggravation in recent 5 years, and complained of continuous burning, throbbing and lancinating pain in coccygeal and perineal area with tactile hyperalgesia and allodynia. He also had

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paresthesia and a painful urge sensation to defecate. The pain was constant at a level of 8–9 on the numerical rating scale (NRS), which aggravated with sitting and alleviated in part by standing or lying down. Before visiting our institution, caudal epidural and coccygeal nerve blocks had been tried previously at other pain clinics without effect. The patient was under medications of 5 mg amitriptyline, 325 mg acetaminophen and 37.5 mg tramadol complex (Ultracet[®]) and the lidocaine patch (Lidotop[®]) upon visiting our pain clinic.

For the initial diagnostic approach, a ganglion of impar block was performed. The patient admitted to 80% alleviation of pain for 3 days after the first ganglion of impar block. The pain was also treated with 900 mg gabapentin, 150 mg tramadol, 10 mg nortriptyline, 0.25 mg alprazolam and fentanyl patch (12 μ g/hr) per day. Ganglion of impar block was performed four times consecutively at 1 week interval. However there was no further pain relief, and when the NRS level returned to 9, we decided to perform PNBs bilaterally under the fluoroscopy guidance.

The patient was placed in the prone position with a pillow under his abdomen to flex the lumbar spine and relax the muscles. He was monitored with electrocardiogram, noninvasive blood pressure and pulse oximetry. The ischial spine was the target anatomic landmark for the block. An optimal ischial spine view was obtained as follows. The targeted pelvic side was located approximately in the middle of the C-arm fluoroscope screen in the anteroposterior (A-P) view. Since the ischial spine overlapped with the ipsilateral pelvic brim in the A-P fluoroscopic imaging, the C-arm fluoroscope was rotated about 5–20 degrees to the block side until the ischial spine was clearly identified. Then the C-arm fluoroscope was tilted

toward cephalad or caudad until the ischial spine tip was clearly visualized within the obturator foramen.

A skin entry point was just above the tip of the ischial spine. After the local anesthetic infiltration, a 22-gauge radiofrequency (RF) cannula with a 10 mm active tip was slowly advanced to the base of the ischial spine tip in parallel to the beam of the C-arm fluoroscope. While carefully walking off the tip of the ischial spine, when there appeared a “popping sensation” of the ligamentous structure, the correct position of the needle tip was confirmed in the lateral view. Then the proper needle placement at the pudendal nerve was also verified with a sensory stimulation at 0.2 V using the RF lesion generator, under which paresthesia was felt at anoperineal area. Thereafter, 6 ml of 0.25% levobupivacaine with 20 mg triamcinolone was injected.

The bilateral PNB resulted in a pain relief with a drop of the NRS level from 9 to 6. The nerve block reduced the amount of supplementary medication needed to control the pain. Gabapentin was reduced from 900 to 600 mg per day, and nortriptyline and alprazolam were also reduced to 0.5 mg and 0.125 mg respectively. Further bilateral PNBs were performed twice in sequence at 2 week interval. The latter two blocks diminished the pain further with the NRS level decline to 5, but the duration of pain subsidence was no longer than 2 weeks. In order to extend the duration of the pain relief, we decided to deliver a PRF treatment. After the local anesthetic infiltration, a 22-gauge 100 mm radiofrequency (RF) cannula with a 10 mm active tip was advanced to the base of the ischial spine tip in the same manner as described previously (Fig. 1). The proper needle placement at the pudendal nerve was identified with a sensory stimulation under voltage control

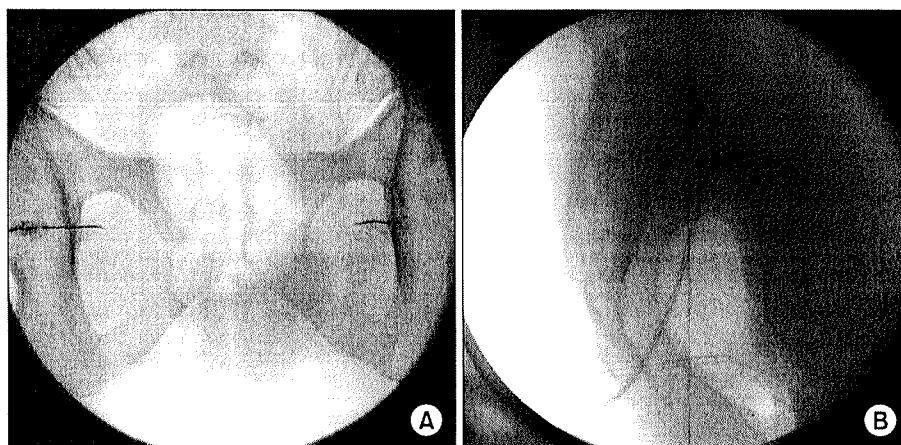


Fig. 1. Radiofrequency cannula position near the ischial spine tip in the anteroposterior (A-P) (A) and the lateral (B) fluoroscopic imaging. The radiofrequency cannula is placed near the ischial spine tip within the obturator foramen in the A-P view (A).

using the RF lesion generator (Baylis RF Pain Management generator ver 2.1, Baylis Medical Company Inc., Canada). A sensory stimulation at 0.2 V using 50 Hz frequency with a 1 msec duration produced paresthesia at anoperineal area. Three complete cycles of PRF were delivered at 42°C for 90 seconds. 0.25% levobupivacaine 2 ml was injected after each PRF treatment to relieve post-RF lesioning pain. The treatment resulted in a pain relief of the NRS level 5, for an extended period of more than 8 weeks even during the sitting position. The patient admitted to a sustained pain relief with the PRF treatment and with medication of 600 mg gabapentin, 150 mg tramadol, 0.5 mg nortriptyline, 0.125 mg alprazolam and 12 µg/hr fentanyl patch. The pain alleviation maintains well up to the time of this case report.

DISCUSSION

The pudendal nerve block under image-guidance has lead to a minimal patient discomfort, an increase in physician and patient safety and a favorable outcome. Knowledge of the pudendal nerve anatomy is crucial in application of the pudendal nerve block techniques. Robert et al [2] suggested that the pudendal nerve is situated in-between the sacrospinous and sacrotuberous ligaments (interligamentous plane) at the ischial spine level. This forms the target for a needle placement in CT-, ultrasound- and fluoroscopy-guided techniques. The use of CT to PNB added a level of precision, however there are limitations in routinely utilizing this approach at pain clinics. This imaging needs to be performed in a radiologic suite, requires an aid of a radiologist, takes a long procedural time and is expensive.

A recent publication on real-time ultrasound for PNB also revealed a qualified block technique with high quality images of the anatomical landmarks such as the ischial spine, the internal pudendal artery and the sacrospinous and sacrotuberous ligaments [6]. Since direct visualization of the pudendal nerve by ultrasound is limited [4], the final position of the needle was medial to the ischial spine and the internal pudendal artery, and the outcome was favorable [6]. However, a quality imaging in ultrasound requires expertise in acquisition and interpretation.

On the other hand, a fluoroscopy is readily accessible at most pain clinics, easy to perform and relatively inexpensive. According to Choi et al [5], a fluoroscopy-guided PNB with the ischial spine as a landmark resulted in a successful block

without complications or side effects.

Unlike CT or ultrasonography, a fluoroscopy-guided PNB does not visualize the interligamentous plane or the internal pudendal artery. However, since the sacrospinous ligaments attach at the tip of the ischial spine, and the fluoroscopy-guided PNB entails "popping sensation" of the sacrospinous ligament as the needle is advanced at the tip of the ischial spine, local anesthetics spread well along the interligamentous plane where the pudendal nerve is situated in vicinity to the tip of the ischial spine. The risk and the incidence of puncturing the internal pudendal artery are insignificant because the artery usually lies medial to the tip of the ischial spine.

In adjunct to the fluoroscopy-guided pudendal nerve approach, we used a sensory stimulation of the RF lesion generator to make a fine adjustment of the needle and locate the pudendal nerve more precisely. The sensory stimulation allowed the nerve block to be performed more accurately in a more reliable and safer manner than the block alone under a fluoroscopy-guidance. The mechanism of a PRF treatment on chronic pain is not yet fully understood. However, laboratory literatures and clinical outcome suggest its neurobiologic phenomenon concerning minimally tissue-destructive, painless and prolonged pain relieving effects on chronic pain syndromes [7]. In our case, the pain intensity decreased and the duration of the pain alleviation was prolonged with the PRF treatment.

Chronic pelvic and perineal pain can be associated with the pathology of urogenital tract or pelvis [1], and in some cases, with pudendal neuralgia secondary to compression [2]. In the differential diagnosis of this case, ganglion of impar blocks resulted in a partial and limited pain relief, however the subsequent pudendal nerve blocks alleviated the pain substantially.

Ganglion of impar blocks are applied in the evaluation and management of a sympathetically mediated pain of the perineum, rectum and genitalia [8]. Patients with vague burning and localized perineal pain with urgency may benefit from the block, which impedes visceral or sympathetically maintained pain in the perineal area. On the other hand, pudendal nerve blocks are used in the evaluation and management of pelvic pain that is postulated to be of somatic origin [9]. From the differential diagnostic block, we postulated that the initial attempt of ganglion of impar block might have reduced the pain only to a limited degree because the nature of pain may have been more of somatic origin than of a sympathetically mediated component. Pudendal neuropathy associated with nerve compression may be the major contributing factor in this pa-

tient's pain. However, pudendal neuropathy may not be the only due diagnosis of this patient because the nature of the patient's pain may be more complicated than of a single etiology.

The pain level dropped to the NRS score of 5 after the PRF treatment of the pudendal nerve and the subsequent oral medications were reduced in dosage. In managing the neuropathic pain, oral medications are not terminated abruptly even if PRF treatments were highly successful. They are often maintained or reduced to effect satisfactory analgesia thereafter [10]. In this case, oral medications following the PRF treatment were reduced according to the pain relief.

We believe that the fluoroscopy-guided PNB and PRF treatment are safe and reliable techniques, which attain sustained therapeutic effects.

REFERENCES

1. Wesselmann U, Burnett AL, Heinberg LJ. The urogenital and rectal pain syndromes. *Pain* 1997; 73: 269-94.
2. Robert R, Prat-Pradal D, Labat JJ, Bensignor M, Raoul S, Rebai R, et al. Anatomic basis of chronic perineal pain: role of the pudendal nerve. *Surg Radiol Anat* 1998; 20: 93-8.
3. Calvillo O, Skaribas IM, Rockett C. Computed tomography-guided pudendal nerve block. A new diagnostic approach to long-term anoperineal pain: a report of two cases. *Reg Anesth Pain Med* 2000; 25: 420-3.
4. Kovacs P, Gruber H, Piegger J, Bodner G. New, simple, ultrasound-guided infiltration of the pudendal nerve: ultrasonographic technique. *Dis Colon Rectum* 2001; 44: 1381-5.
5. Choi SS, Lee PB, Kim YC, Kim HJ, Lee SC. C-arm-guided pudendal nerve block: a new technique. *Int J Clin Pract* 2006; 60: 553-6.
6. Rofacel A, Peng P, Louis I, Chan V. Feasibility of real-time ultrasound for pudendal nerve block in patients with chronic perineal pain. *Reg Anesth Pain Med* 2008; 33: 139-45.
7. Cahana A, Van Zundert J, Macrea L, van Kleef M, Sluiter M. Pulsed radiofrequency: current clinical and biological literature available. *Pain Med* 2006; 7: 411-23.
8. Erdine S, Ozyalcin NS. Pelvic sympathetic blocks. In: *Interventional pain management: image guided procedures*. 2nd ed. Edited by Raj PP: Philadelphia, Saunders Elsevier. 2008, pp 400-4.
9. Waldman SD. Pelvic somatic blocks. In: *Interventional pain management: image-guided procedures*. Edited by Raj PP: Philadelphia, Saunders Elsevier. 2008, pp 391-3.
10. Kim YH, Lee CJ, Lee SC, Huh J, Nahm FS, Kim HZ, et al. Effect of pulsed radiofrequency for postherpetic neuralgia. *Acta Anaesthesiol Scand* 2008; 52: 1140-3.