

Pudendal neuralgia: CT-guided pudendal nerve block technique

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Abstract

Chronic anoperineal pain without any apparent etiology may be caused by compression of the pudendal nerve. This presentation illustrates the course of the pudendal nerve and the technique of computed tomography-guided infiltration of the nerve.

Key words: Pudendal nerve—Pudendal canal syndrome—Computed tomographic guidance.

Chronic anal or perineal pain without evident origin is a frequent complaint. Boisson et al. [1], as early as 1966, and then Neil and Swash [2] suggested that idiopathic chronic anoperineal pain may be caused by a neuropathy. Although perineal neuralgia has been successfully treated by tricyclic antidepressants and anticonvulsants, the management of these patients remains problematic [1–3] and explains the attention that has been given to anoperineal neuralgic syndrome caused by compression of the pudendal nerve [4–6]. This type of neuralgia may be relieved by a truncal anesthetic block (anesthetics and corticoids) used in treating other entrapment syndromes.

The aim of the present report is to demonstrate the computed tomographic (CT) anatomy of the course of the pudendal nerve and the method of CT-guided truncal block.

Anatomy of the pudendal nerve

The pudendal nerve is a mixed nerve (sensory and motor) derived from the somatic component of sacral roots S2–S4. It supplies the anal and urethral sphincters, the pelvic

floor muscles, and anal, perineal, and genital sensitivity. During this course, the nerve crosses through three anatomic regions successively, i.e., the pelvic cavity, the gluteal region, and the perineal region, where it divides into two terminal branches: the dorsal nerve of the penis (or clitoris) and the perineal nerve.

The pudendal nerve arises from S2–S4 branches at the ventral part of the piriformis muscle in the pelvic cavity and then enters the gluteal region by coursing through the greater sciatic foramen in the infrapiriformis canal. The gluteal part of the nerve course is short in this area, where it crosses over the ischial spine to pass into the perineal region through the lesser sciatic foramen. In the perineal region, the nerve courses along the obturator internus muscle in a duplication of the muscle fascia called the pudendal canal.

During this course, there are two critical zones where a compression of the nerve is likely to occur [7]. The principal site of nerve compression is at the ischial spine in the gluteal region. The nerve is strained on the extremity of the ischial spine at the attachment of the sacrospinous ligament and is simultaneously entrapped ventrally by the sacrospinous ligament and dorsally by the sacrotuberous ligament, which is thickest and narrowest at this particular site. The course of the nerve also crosses the inner border of the sacrotuberous ligament, which is thickened at the beginning of the falciform process. The second zone of compression may occur in the perineal course of the nerve in the pudendal canal, where the nerve courses over the upper border of the falciform process.

CT anatomic study

To illustrate the course of the pudendal nerve on CT examination and to provide a guide for CT nerve block, we carried out a radiologic study.

In two cadavers, a copper thread was fixed along the nerve and along the anatomical structures involved in the

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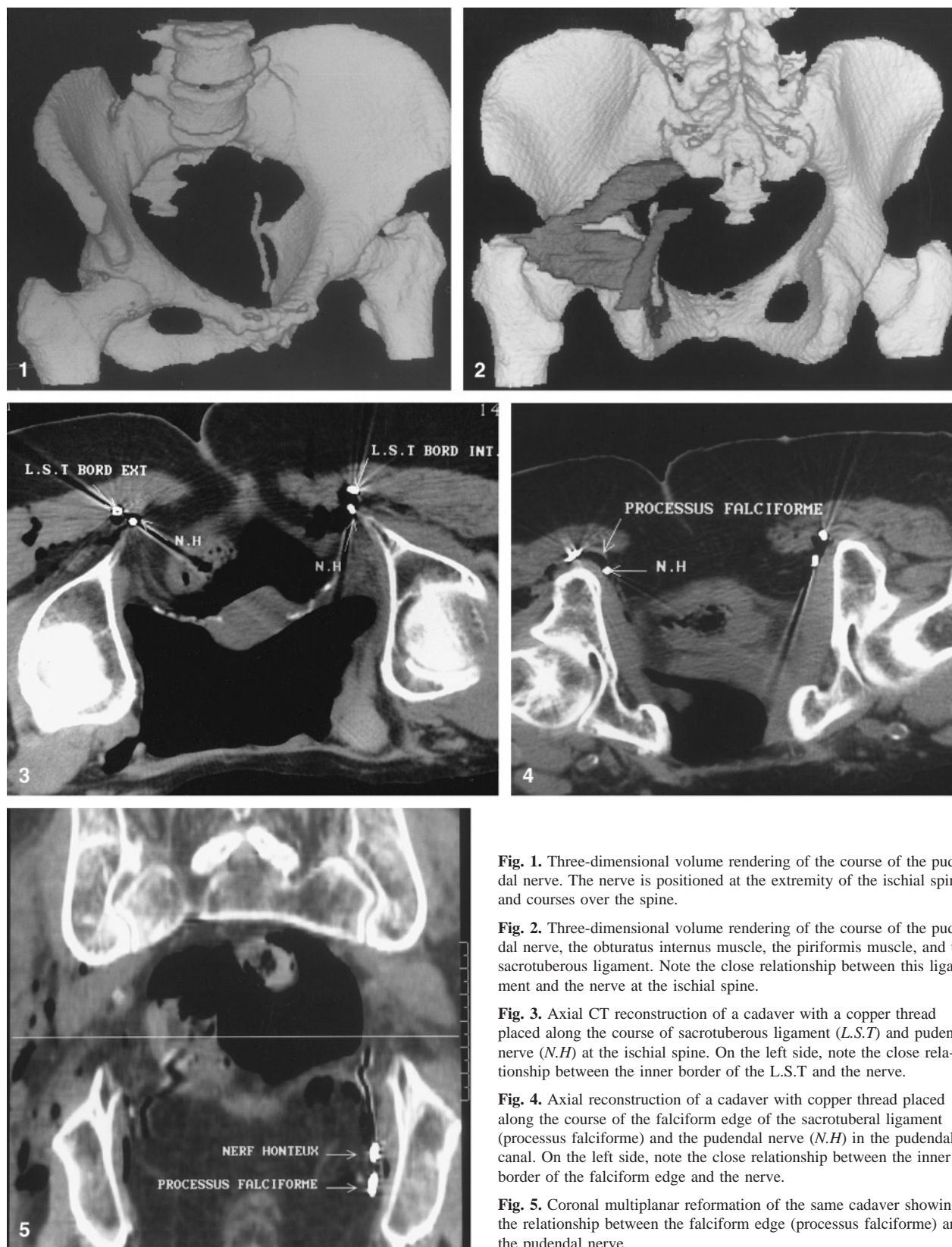


Fig. 1. Three-dimensional volume rendering of the course of the pudendal nerve. The nerve is positioned at the extremity of the ischial spine and courses over the spine.

Fig. 2. Three-dimensional volume rendering of the course of the pudendal nerve, the obturator internus muscle, the piriformis muscle, and the sacrotuberous ligament. Note the close relationship between this ligament and the nerve at the ischial spine.

Fig. 3. Axial CT reconstruction of a cadaver with a copper thread placed along the course of sacrotuberous ligament (L.S.T) and pudendal nerve (N.H) at the ischial spine. On the left side, note the close relationship between the inner border of the L.S.T and the nerve.

Fig. 4. Axial reconstruction of a cadaver with copper thread placed along the course of the falciform edge of the sacrotuberous ligament (processus falciforme) and the pudendal nerve (N.H) in the pudendal canal. On the left side, note the close relationship between the inner border of the falciform edge and the nerve.

Fig. 5. Coronal multiplanar reformation of the same cadaver showing the relationship between the falciform edge (processus falciforme) and the pudendal nerve.



Fig. 6. **A** Pudendal nerve block at the ischial spine. Needles are placed directly at the end of the ischial spine. **B** Post infiltration, the solution is seen between the sacrotuberous and sacrospinous ligaments.

Fig. 7. **A** Pudendal nerve block at the pudendal canal. **B** After infiltration, the solution is observed in the pudendal canal along the obturator internus fascia.

critical zone of compression, i.e., the sacrospinous and sacrotuberous ligaments and the falciform process.

Spiral CTs were performed on a twin flash CT (Elscent Ltd., Haifa, Israel). Spiral acquisitions were performed with 3.2-mm collimation and a dual pitch of 1 and was reconstructed with a 512 × 512 matrix, a 360° linear interpolation algorithm, and axial sections generated at 1.6 mm intervals. These data were then networked on to an imaging workstation (Omnipro, Elscint Ltd.) for multiplanar and volume rendering.

The results corroborated the anatomic description of the course of nerve. Three points must be emphasized:

1. The pudendal nerve crosses the ischial spine exactly at its extremity on the attachment of the sacrospinous ligament to the ischial spine (Figs. 1, 2).
2. During this crossing, the nerve is covered by the inner

border of the sacrotuberous ligament, which is seen as a dense linear structure applied on the ventral part of the gluteus maximus muscle (Fig. 3).

3. The falciform process is observed as a dense structure along the obturator internus, and the pudendal canal is in a ventral position to the falciform process along this muscle (Figs. 4, 5).

CT-guided pudendal nerve block

The CT-guided pudendal nerve block should be made at the site of potential compression.

The patient is placed in the prone position. Five-millimeter collimation CT images are obtained from the head of femur to the ischium. The ischial spine, sacrospi-

nous and sacrotuberous ligaments, and falciform process are then located. After aseptic cleaning, a 22-gauge needle is placed transgluteally, directly avoiding the adjacent sciatic nerve at either the extremity of the ischial spine between the sacrotuberous and sacrospinous ligament to infiltrate the principal site of compression (Fig. 6) or the medial part of the obturator internus muscle under the falciform process to infiltrate into the pudendal canal (Fig. 7). After checking the exact location of the needle tip, 5 mL of 1% lidocaine and 1.5 mL of long release glucocorticoids are injected. Lidocaine produces a cutaneous anesthesia of the pudendal nerve territory and confirms the exact location of the nerve block.

Infiltrations are made first at the ischial spine. If two consecutive nerve blocks into the ischial spine fail, a third injection can be made into the pudendal canal. Each nerve block is carried out after a delay of 1 week.

Infiltration is made uni- or bilaterally according to the location of the pain.

Patients are ambulatory and the only contraindication is a hemostatic disorder. Because the diffusion of lidocaine around the injection site may temporarily anesthetize the sciatic nerve, patients are advised to abstain from driving a vehicle in the hours that follow infiltration.

Discussion

Chronic anoperineal pain with no proctologic, urologic, or gynecologic etiology is frequent and difficult to manage. Patients are often referred from one specialist to another without a final comprehensive diagnosis. Several syndromes have been described to explain these pains, i.e., proctalgia fugax, coccygodynia, or levator ani syndrome [8].

However, when the patient complains of burning, pinching, or twisting in the territory of the pudendal nerve, pudendal neuropathy should be considered. Pudendal neuralgia may be caused by an elongation or a compression of the nerve. Compression is more likely to occur when pain is increased by a sitting position and decreased by standing or lying down. Compression of the

pudendal nerve was first described by Amareno et al. and is known as the pudendal canal syndrome [4]. As with other entrapment neuropathies, infiltration of the nerve with glucocorticoids at the compression site may relieve pain and serve as a particularly useful diagnostic and therapeutic tool. In cases in which there is a recurrence after successful infiltration, surgical decompression of the nerve may be considered [5–7, 9].

CT guidance provides an excellent landmark for infiltration. In more than 90% of infiltrations, we obtained anesthesia of the cutaneous territory of the pudendal nerve, which confirms the accuracy of infiltration. This technique is quick and easy to perform. In our experience, no complications were observed even after more than 200 infiltrations.

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