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How I Do It

Transdermal midline approach for ganglion impar block via the sacrococcygeal junction under fluoroscopic guidance: step-by-step technique

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Introduction
Chronic pain affecting the coccygeal, perineal, or sacral regions can be severely disabling and may originate from trauma, malignancy, surgery, or idiopathic causes. The ganglion impar, also known as the ganglion of Walther, is the terminal convergence of the bilateral sympathetic chains, located anterior to the sacrococcygeal junction. This report aimed to describe a safe, fluoroscopy-guided midline transdermal approach to the ganglion impar through the sacrococcygeal junction and demonstrate its applicability in treating chronic pelvic and perineal pain.

Technique
With the patient in the prone position and a pillow under the pelvis, the sacrococcygeal junction is identified under anteroposterior fluoroscopy. After local infiltration, a 22G spinal needle is inserted vertically along the midline and advanced through the sacrococcygeal ligament into the presacral space. Proper needle positioning is confirmed in lateral view. After negative aspiration, contrast is injected to confirm spread in the retroperitoneal space. A therapeutic injection (e.g., ropivacaine with dexamethasone) or pulsed radiofrequency (42°C, 120 seconds) may then be performed, depending on the indication.

Conclusion
The midline transdermal approach via the sacrococcygeal junction offers a direct, reproducible, and minimally invasive method for accessing the ganglion impar. It minimizes risk to adjacent structures and should be considered a first-line technique for sympathetic blockade in patients with chronic coccygeal, perineal, or pelvic pain refractory to conventional treatments.

Keywords: Retroperitoneal space, Pelvic pain, Sacrococcygeal region, Fluoroscopy, Ganglion impar

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Introduction

Chronic pain in the coccygeal, perineal, or sacral regions can be highly disabling and may arise from trauma, surgery, malignancy, or idiopathic origins (1–8). The ganglion impar, also known as the ganglion of Walther or sacrococcygeal ganglion, represents the terminal convergence of the bilateral sympathetic chains (9). It is located in the pelvic retroperitoneum, anterior to the sacrococcygeal junction, and serves as a key target for neuromodulatory pain interventions (9,10).

In an anatomical study (9), the authors reported that the ganglion impar shows marked variability in shape, most frequently oval (26%) or irregular (20%), but also triangular (14%), elongated (10%), rectangular (8%), or U-shaped (8%). In some cases (14%), the caudal ends of the sympathetic trunks join without forming a clear ganglion. Average dimensions varied according to shape, with oval ganglia measuring 2.5 × 1.1 mm, irregular 4.2 × 2.5 mm, triangular 1.9 × 1.3 mm, rectangular 1.8 × 0.7 mm, and elongated with a mean length of 4.4 mm. Its location averages 8.6 mm from the sacrococcygeal joint and 25 mm from the coccygeal tip, with position correlating significantly with coccyx length. Nearby sacral nerve branches were observed in 6% of cases, with distances ranging from 2.8 to 10.3 mm. Additional coccygeal ganglia were identified in 12% of specimens (9). It provides sympathetic and nociceptive innervation to several pelvic and perineal structures, making it a key target for neuromodulatory interventions. (10–23).

Given this, the ganglion impar has become a target for various interventional treatment approaches, including infiltration with local anesthetics, corticosteroids, neurolytic agents such as phenol, and the application of radiofrequency (PRF) techniques (14,15,23–33).

An interesting commentary can be found regarding the origin and pioneering aspects of the technique (33), which date back to the early 1990s. At that time, the approach represented a novel concept in surgery and laid the groundwork for subsequent refinements that have since become part of routine clinical practice.

To accomplish this, specialists commonly use fluoroscopy, ultrasound, or computed tomography to guide needle placement and ensure accurate targeting of the ganglion impar. Fluoroscopically guided blockade of the ganglion impar is an established technique; however, variation exists in approach and needle trajectory.

This technical note describes a straightforward midline transdermal approach to the ganglion impar via the sacrococcygeal junction, a route that is generally accessible in most adult patients, with fluoroscopic guidance to ensure accurate needle placement.

Technique

The patient is placed in the prone position, with a pillow under the pelvis to flatten the lumbosacral curvature. After sterile preparation and draping, the sacrococcygeal junction is identified under anteroposterior fluoroscopy. A small volume of local anesthetic is infiltrated into the skin and subcutaneous tissue over the midline.

A 22G spinal needle (8–10 cm) is introduced through the skin in a strictly vertical orientation along the midline and carefully advanced under fluoroscopic guidance. The needle is directed to traverse the sacrococcygeal ligament and enter the presacral space anterior to the junction. Proper depth and placement are confirmed in lateral fluoroscopic view, where the needle tip should lie just anterior to the coccyx.

After negative aspiration for blood or cerebrospinal fluid, 0.5–1.0 mL of nonionic contrast medium is injected to confirm accurate spread in the retroperitoneal space. This produces a characteristic comma-shaped or teardrop-shaped image overlying the anterior sacrococcygeal region.

A firm, controlled advancement of the needle is used to traverse the sacrococcygeal ligament and engage the cartilage. Once the needle is anchored, the loss-of-resistance technique with saline can be employed to confirm entry into the presacral potential space. As the needle is typically not advanced beyond the point of resistance loss, the risk of unintended perforation of adjacent hollow organs is minimal.

Upon confirmation of proper positioning—typically aided by contrast injection under fluoroscopy—a therapeutic intervention may be performed. This can include an injection of 2–4 mL of 0.2% ropivacaine with dexamethasone (34), or PRF applied at 42°C for 120 seconds, depending on the clinical indication.

Throughout the procedure, meticulous needle advancement is essential to avoid inadvertent penetration of the rectum.

Discussion

Chronic perineal pain is characterized by ongoing discomfort localized to the perineal or anorectal region in the absence of a clear structural pathology. Epidemiological data suggest that it affects between 6% and 18% of the population. Its underlying mechanisms remain heterogeneous, encompassing idiopathic origins as well as secondary associations with benign or malignant conditions (35).

The ganglion impar, located anterior to the sacrococcygeal junction, is a key anatomical structure responsible for sympathetic and nociceptive innervation of the perineum, distal rectum, anal canal, urethra, vulva or scrotum, and the distal third of the vagina. Although typically situated at the midline, anatomical variation may result in unilateral or lateralized positioning. In some cases, it may be duplicated, appear unilaterally, or even be absent. Its strategic location and functional role make it an important target for interventional pain management, especially in patients with refractory chronic perineal pain. It avoids lateral or paramedian angles, reducing the chance of rectal or vascular injury. The sacrococcygeal junction is typically patent in most individuals, although fusion or anatomical variation may necessitate an alternative intercoccygeal or lateral approach.

In cases of chronic pelvic or perineal pain unresponsive to conservative treatments, ganglion impar blockade has demonstrated promising efficacy. Techniques such as image-guided injection of local anesthetics and corticosteroids, neurolysis with phenol or alcohol, and pulsed PRF have been successfully employed (17,18). These interventions aim to interrupt the sympathetic pain pathways, leading to sustained analgesia, reduced reliance on systemic medications, and improved functional outcomes.

Our technical approach—utilizing a midline transsacrococcygeal route under fluoroscopic guidance—offers several advantages. This trajectory provides a direct path to the ganglion impar, minimizes the risk of rectal or vascular injury, and avoids the anatomical variability associated with paramedian or intercoccygeal approaches. The use of the loss-of-resistance technique further enhances safety by limiting needle advancement into critical structures.

This method is not only technically straightforward and reproducible but also well tolerated by patients. The choice between pharmacological injection and PRF depends on the underlying pathology, chronicity of symptoms, and prior treatment history. PRF, in particular, has shown efficacy in neuropathic and cancer-related pain, with the added benefit of avoiding tissue destruction.

While additional prospective and controlled studies are necessary to establish long-term outcomes and optimize patient selection, we believe this minimally invasive technique holds significant promise as a first-line interventional option for chronic pelvic pain. Proper anatomical knowledge, imaging guidance, and meticulous needle control are essential for maximizing efficacy and minimizing complications.

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