

A modified needle-inside-needle technique for the ganglion impar block

[Une technique modifiée pour le bloc du ganglion coccygien : une aiguille dans une aiguille]

Muhammad A. Munir MD,* Junming Zhang MS MD,† Mahmood Ahmad MD‡

Purpose: The ganglion impar is the fused terminus of the paired sympathetic chain located at the level of the sacrococcygeal junction. It has been blocked using a bent and a curved spinal needle via the anococcygeal ligament. It has also been approached through the sacrococcygeal disc using a straight spinal needle. We describe a needle-inside-needle modification of the latter approach.

Technical features: A 22-gauge (G), 1½-inch (38 mm) needle is introduced through the sacrococcygeal ligament under fluoroscopy via the sacrococcygeal disc. A 25-G, 2-inch (50 mm) needle is introduced through the 22-G needle. Placement is confirmed with injection of iopamidol 300, 0.2 mL in the retroperitoneal space with the comma sign.

Conclusions: The bent and curved needle techniques are associated with significant discomfort, tissue trauma and risk of rectal perforation due to difficulty in obtaining a midline needle tip position. The straight spinal needle approach minimizes these problems, however there is increased risk of discitis and a longer spinal needle may help also raise incidence of needle breakage. The needle-inside-needle technique may reduce these risks.

Objectif: Le ganglion coccygien est l'extrémité fusionnée de la chaîne sympathique pairée localisée à la jonction sacro-coccygienne. On a déjà utilisé une aiguille coudée ou courbée pour réaliser le bloc de ce ganglion en passant par le ligament ano-coccygien. On a aussi utilisé une aiguille rachidienne droite pour traverser le disque sacro-coccygien. Nous décrivons une modification «aiguille dans une aiguille» de cette dernière approche.

Caractéristiques techniques : Sous fluoroscopie, une aiguille de calibre 22 et de 38 mm est introduite dans le ligament sacro-coccygien en passant par le disque sacro-coccygien. Une aiguille de calibre

25, de 50 mm, est introduite dans l'aiguille 22. La mise en place est confirmée par le signe de la virgule avec l'injection de 300 mL d'iopamidol à 2 % dans l'espace rétro-péritonéal.

Conclusion : L'utilisation d'une aiguille coudée ou courbée est associée à un inconfort important, un traumatisme tissulaire et un risque de perforation rectale dû à la difficulté d'obtenir une position médiane de la pointe de l'aiguille. L'aiguille rachidienne droite réduit ces problèmes, mais augmente le risque de discite ; une aiguille rachidienne plus longue peut aussi élever l'incidence de cassure de l'aiguille. La technique «d'une aiguille dans une aiguille» peut réduire ces risques.

VISCERAL and somatic pain arising from disorders of pelvic viscera and somatic structures is a common cause of discomfort, especially in women. The perineum is composed of diverse anatomic structures with extensive sympathetic and somatic innervation. The extensive and redundant innervation may well be one of the reasons that explain the limited efficacy of various analgesic therapies.¹ Historically, nerve blocks in this region are targeting somatic, rather than sympathetic, components. Plancarte *et al.*¹ described a bent needle technique for ganglion impar block as an alternative means of managing intractable neoplastic perineal pain of sympathetic origin. The trans-sacrococcygeal approach described by Wemm *et al.*² used a straight 22-gauge (G), 3½-inch (88 mm) spinal needle for ganglion impar block. Increased incidence of needle

From the Department of Anesthesiology, Perioperative and Pain Medicine,* Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts; Department of Anesthesiology,† and the United Pain Care,‡ University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA.

Address correspondence to: Dr. Muhammad A. Munir, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, 75 Francis Street, Boston, Massachusetts, USA. Phone: 617-732-6708; Fax: 617-731-5453; E-mail: mmunir@partners.org

Presented in part at the American Society of Anesthesiologists' Annual meeting (October 14–19, 1999) at Dallas, Texas, United States of America.

Accepted for publication June 19, 2003.

Revision accepted June 11, 2004.

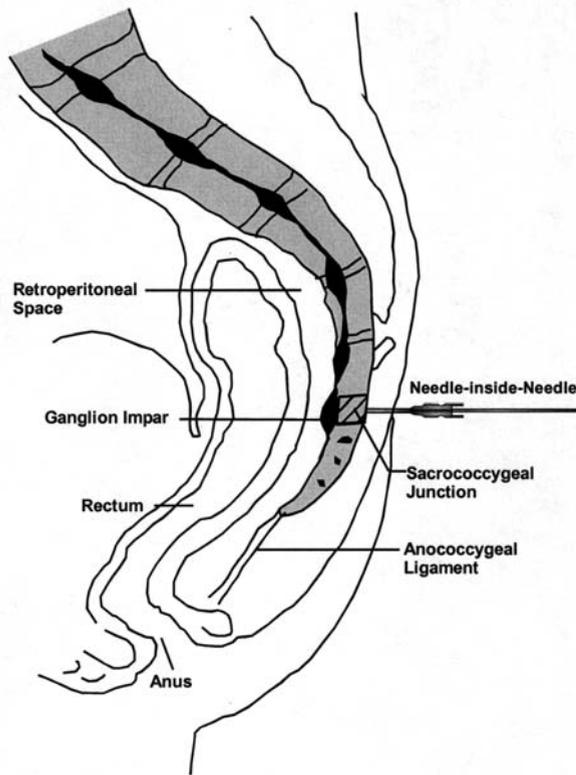


FIGURE 1 Schematic showing ganglion impar block with *needle-inside-needle* technique through sacrococcygeal disc.

breakage in our experience with the bent needle technique and with the longer straight needle technique provided impetus to develop the *needle-inside-needle* technique for ganglion impar block.

Technique report

The patient is placed in the prone position with a pillow under the abdomen to allow flexion of the lumbo-sacral spine or, alternatively, the operating table is flexed to allow flexion of the lumbo-sacral spine. The lower extremities are rotated internally so that the toes are pointing towards the opposite foot. The intergluteal area is prepped in a sterile fashion. A skin wheal is raised with 0.5% lidocaine using a 25-G needle over the sacrococcygeal disc at the superior aspect of the intergluteal crease just below the sacral hiatus. A lateral fluoroscopic projection is obtained. A true lateral image is obtained by superimposing the two greater sciatic notches. A 22-G, 1½-inch (38 mm) Quincke spinal needle (Becton, Dickinson and Company, Rutherford, NJ, USA) that serves as a needle guide is introduced under fluoroscopic guidance through the

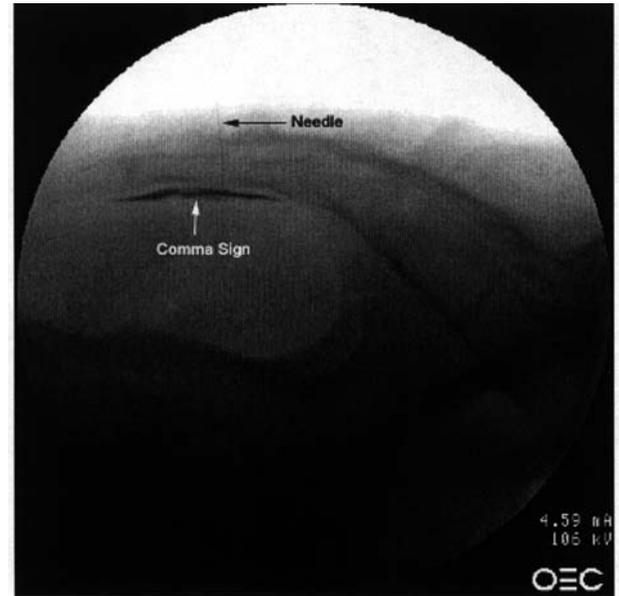


FIGURE 2 Comma sign after injection of contrast media. A lateral projection of a patient in prone position with needle as marked with arrow through the sacrococcygeal disc. The spread of contrast marked with arrow is described as “comma sign” and indicates proper positioning of the needle.

sacrococcygeal disc. A 25-G, 2-inch (50 mm) Quincke spinal needle is then introduced through the 22-G needle (Figure 1). The needle placement is confirmed by the “comma sign” (Figure 2) that is induced in the retroperitoneal space by the injection of a small volume of non-ionic contrast solution (0.2 mL of iopamidol 300). A total volume of 1 to 3 mL of preservative-free 0.25% bupivacaine is injected in divided doses for diagnostic and prognostic purposes, or alternatively, 1 to 2 mL of 10% phenol in meglumine or absolute alcohol are injected for therapeutic chemical neurolysis.

Discussion

The ganglion impar is a solitary retroperitoneal structure located at the level of the sacrococcygeal junction that marks the termination of the paired paravertebral sympathetic chains. Once the diagnosis of sympathetically mediated pain in the perineum is suspected, a patient may be offered a diagnostic ganglion impar block using a local anesthetic. If considerable pain relief is achieved, a diagnosis of sympathetically maintained perineal pain can be contemplated. The ganglion impar block may be repeated using long-acting

local anesthetics after considering the duration of pain relief from the diagnostic block or a neurolytic approach may be adopted.

Plancarte *et al.*¹ first described the technique of ganglion impar block in 1990. This technique comprises placement of a manually bent 22-G, 3½-inch spinal needle directed cephalad through the anococcygeal ligament. In order to rule out accidental perforation of the rectum by the spinal needle, a continuous rectal examination is performed by the operator with the index finger of his non-dominant hand. The disadvantages of the bent needle technique include tissue trauma along its plane of angulation, possibility of needle breakage, failure of injection spread to ganglion impar because of local tumour spread, rectal perforation, and periosteal injection because of the failure to confirm postero-anterior orientation of the needle. In addition, rectal perforation will result in needle contamination and increases the risk of needle-stick injury to the operator's finger in the rectum.

Nebab *et al.*³ described a modified needle geometry to address the disadvantages of the manually bent needle. Theoretically, a curved needle technique causes less tissue trauma. However, there is still a risk of needle breakage, failure of injection spread due to local tumours, and most importantly, failure to attain the midline orientation.

The trans-sacrococcygeal approach described by Wemm *et al.*² is a major advancement in the technique of ganglion impar block. The sacrococcygeal approach is extremely quick and easy to perform. However, puncture of the sacrococcygeal disc necessitates that the integrity of this structure be breached. The sacrococcygeal disc, made up mainly of glycoprotein during the early years of life, may later ossify.⁴ Discitis and bleeding are potential complications after penetration of the disc.⁵ We describe a *needle-inside-needle* modification of this latter approach (Figure 1). We speculate that the risk of breakage of the needle and rectal perforation is decreased by using shorter (1½-inch and 2-inch) needles compared to a longer spinal needle of similar gauge. Another possible advantage of the *needle-inside-needle* technique is that withdrawal of the 25-G needle through a 22-G needle at the end of the procedure decreases the risk of percutaneous spillage of the injectate, which in turn may prevent discitis or fistula formation. Flushing the needle with preservative free saline and re-styleting the needle are other ways to minimize percutaneous spillage of the injectate. In addition, radiofrequency ablation of the ganglion impar may not be possible with the bent and curved needle techniques as bending the needle may result in breakage of needle insulation. A *needle-inside-needle* technique may allow

pain physicians to use radiofrequency ablation for ganglion impar neurolysis.

Ganglion impar block can be performed using the *needle-inside-needle* approach relatively safely and easily. Theoretically, the *needle-inside-needle* technique may reduce the risk of complications associated with other techniques described earlier, and may prove to be the technique of choice for ganglion impar block.

References

- 1 Plancarte R, Velazquez R, Patt RB. Neurolytic blocks of sympathetic axis. *In*: Patt R (Ed.). *Cancer Pain*. Philadelphia: JB Lippincott Publishers; 1993: 417–20.
- 2 Wemm K Jr, Saberski L. Modified approach to block the ganglion impar (ganglion of Watther). (Letter). *Reg Anesth* 1995; 20: 544–5.
- 3 Nebab EG, Florence IM. An alternative needle geometry for interruption of the ganglion impar. *Anesthesiology* 1997; 86: 1213–4.
- 4 Ro C, Cramer G. The sacrum, sacroiliac joint and coccyx, *In*: Cramer G, Darby S (Eds). *Basic and Clinical Anatomy of the Spine, Spinal Cord, and ANS*. St. Louis: Mosby-Year Book; 1995: 241–2.
- 5 Loev MA, Varklet VL, Wilsey BL, Ferrante FM. Cryoablation: a novel approach to neurolysis of the ganglion impar. *Anesthesiology* 1998; 88: 1391–3.