Case Report

Computed Tomography-Guided Bilateral Transdiscal Superior Hypogastric Plexus Neurolysis

Joshua Dooley, MD, Christopher Beadles, MD, Kok-Yuen Ho, MD, Farrukh Sair, MD, Linda Gray-Leithe, MD, and Billy Huh, MD, PhD

Duke University Medical Center—Anesthesiology, Durham, North Carolina, USA

A B S T R A C T

Objective. This report describes a case of computed tomography (CT)-guided bilateral posteromedian transdiscal approach to the superior hypogastric plexus with neurolysis for treatment of intractable abdominal pain secondary to metastatic prostate cancer. The case is considered in relation to other approaches described in the literature.

Design. Case presentation and literature review.

Patients. An 83-year-old man with metastatic prostate cancer and intractable abdominal pain.

Interventions. Computed tomography-guided bilateral posteromedian transdiscal neurolysis of the superior hypogastric plexus.

Results. Pain reduction for intractable metastatic prostate cancer abdominal pain.

Conclusions. Neurolysis of the superior hypogastric plexus is effective in treating metastatic prostate cancer abdominal pain. While there are significant risks to the CT-guided bilateral transdiscal approach to the superior hypogastric plexus, it may be used effectively as an alternative to navigate anatomic obstacles necessary to perform the neurolysis.

Key Words. Superior Hypogastric Plexus; Transdiscal; Neurolysis; Cancer Pain; Computed Tomography-Guided

Introduction

The superior hypogastric plexus block is an effective treatment for cancer-related pelvic pain. The plexus is a bilateral retroperitoneal structure located anterior to the aortic bifurcation with access that is often limited by the iliac crest and the L5 transverse process. Since the first description of the technique by Plancarte [1], multiple techniques have been employed to access the superior hypogastric plexus. We report a computed tomography (CT)-guided bilateral posteromedian transdiscal approach to the superior hypogastric plexus.

Case Report

An 83-year-old man inpatient with metastatic prostate cancer and intractable abdominal pain was referred to the pain consultation service for pain management. He required a significant amount of systemic opiate therapy for adequate analgesia but poorly tolerated their side effects including nausea, vomiting, constipation, pruritis, and altered mental status. Upon evaluation and physical examination, his pain was located predominantly in the pelvic region. He was deemed a suitable candidate for a superior hypogastric plexus neurolysis. The superior hypogastric plexus is located retroperitoneally anterior to the aortic bifurcation and receives sympathetic input from the L4 and L5 splanchnic nerves and parasympathetic contribution from the S2 to S4 ventral nerve roots. Hence, a sympathectomy can be performed.
by targeting the region anterior to the L4-L5 junction. The technique recommended by Brown [2] employs inserting a needle into the triangle formed by the iliac crest, the inferior border of the L5 transverse process, and the L5 vertebral body until the needle tip is immediately anterior to the L5-S1 junction. However, CT images revealed that the patient had a collapsed L5-S1 disc and osteophyte formation at the L5 transverse process extending to the iliac crest and obstructing passage of the needle into the triangle region. The decision was made to target the anterior aspect of the L4-L5 junction transdurally under CT guidance. The L4-L5 interdiscal space was identified and two 22 gauge 7-inch spinal needles were advanced bilaterally 9 cm lateral to the midline under CT guidance, one from the left side and one from the right. As neither needle was able to reach midline, a bilateral approach was used to ensure adequate spread of local anesthetic. Both needles were advanced through the L4-L5 disc until the needle tips extended beyond the anterior annulus of the disc, and 1 mL of Isovue-200M contrast was injected to confirm needle tip placement anterior to the periaortic retroperitoneal space outside the L4-L5 lumbar disc (Figure 1). A total of 7.5 mL of bupivacaine 0.5% was injected on each side after negative aspiration for blood. There were no complications associated with the procedure and the patient reported decreased abdominal pain from 9/10 to 2/10 on the Verbal Rating Scale, for 12 hours following the procedure. This amount of time was allowed to elapse upon patient request. Following the successful prognostic block with bupivacaine, a superior hypogastric neurolysis was performed. A 7 mL mixture containing 3.5 mL of ethanol and 3.5 mL of bupivacaine 0.5% was injected on each side. The patient reported significant pain relief following the neurolysis and was discharged to hospice care.

**Discussion**

Superior hypogastric plexus block has been previously described for the treatment of chronic nonmalignant pain and intractable cancer pain. It is most notable for treatment of pelvic pain related to gynecologic, rectal, and genitourinary malignancies. One group reports a 69% effectiveness rate of neurolytic superior hypogastric plexus blocks for chronic pelvic pain associated with cancer [3]. The classic posterior approach described by Plancarte [1] utilized two needles and fluoroscopic guidance. This approach employs needles just anterior to the upper portion of the sacrum. This is achieved by introducing needles between the L5 spinous process and the upper border of the sacrum while advancing medially and caudally under fluoroscopic guidance. While this approach is suitable for most patients, anatomic variances in some patients pose technical difficulties. Common obstacles described include an enlarged iliac crest and transverse process of L5, osteophytes, fused spines, and the presence of orthopedic hardware. Various methods have been described to navigate these barriers, including an anterior approach [4] and a transthecal approach [5]. This technique risks damage to bowel, bladder, and the common iliac artery as well as infection if the bowel is penetrated. Weschler et al. attempt to minimize these risks using an anterior approach under CT guidance which more clearly demonstrates soft tissues traversed in needle positioning [6]. For our patient intravascular needle placement and injury to lumbar nerve roots is avoided by utilizing direct CT imaging along with contrast dye injection to ensure proper placement. Transdiscal superior hypogastric plexus block utilizing fluoroscopic guidance has been described as an alternative to the classic approach when proper needle placement is difficult [7]. Transdiscal techniques have

![Figure 1 Final position of the needles showing radio-opaque contrast dye outside of the L4-L5 lumbar disc in the periaortic space.](https://academic.oup.com/painmedicine/article-abstract/9/3/345/1926170/Computed-Tomography-Guided-Bilateral-Transdiscal/Downloaded-from-academic.oup.com/painmedicine/article-abstract/9/3/345/1926170/Computed-Tomography-Guided-Bilateral-Transdiscal)
the added risk of discitis, although the reported risk of infection is extremely low. Disc rupture may also be increased with a transdiscal approach, although this is not supported in the literature. Compared with the single-needle approach, the bilateral approach has the added risk of a second puncture to the patient which should always be weighed against the possible benefit of the procedure. The other most common risks of this procedure include intravascular puncture with local anesthetic toxicity, hematoma formation, and damage to nerve roots. While fluoroscopic guidance for the transdiscal approach is safe and commonly performed, a CT-guided transdiscal approach to the superior hypogastric block offers the clinician an added level of precision with respect to soft tissue and adjacent bony structures that is often necessary to navigate obstacles and avoid damage to vital structures. This approach has significant risks, however, and prior to routine utilization of this technique, a larger scale study demonstrating its safety and efficacy should be completed.

References