Neurolytic Inferior Hypogastric Plexus Block: An Alternative Technique for Treatment of Lower Pelvic and Perineal Cancer Related Pain

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ABSTRACT: The inferior hypogastric plexus block through the transsacral approach under fluoroscopy, using a local anesthetics/ steroid combination for the diagnosis and treatment of chronic pain conditions involving the lower pelvic viscera was first described by Schultz in 2007. Neurolysis of the inferior hypogastric plexus may be useful for pelvic and perineal pain caused by cancer. We described two cases in whom the block performed by Injection of 6-8 ml of phenol 10% bilaterally, by passing a spinal needle through the sacral foramen to treat their intractable lower pelvic and perineal pain. We assessed them for VAS, and their oral morphine (MST) consumption pre and post-procedural and if there is any complication or side effect of the block. Both patients had significant pain relief and reduction of their analgesic consumption. The neurolytic inferior hypogastric plexus block may be a good alternative technique for treatment of lower pelvic and perineal cancer related pain.
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Introduction

The perineum composed of diverse anatomic structures with extensive sympathetic and somatic innervations. The extensive and redundant innervations may well be one of the reasons that explained the limited efficacy of various analgesic therapies (1). Perineal pain is often caused by tumors arising in the distal genitourinary tract and may precede clinical evidence of recurrent disease. It is often described as deep and aching, but it may have a superficial allodynia, tenesmus or bladder spasms may also accompany this type of pain (2). Sympathetically Mediated Perineal Pain (SMPP) is a poorly localized type of pain with a burning quality and a sense of urgency in the perineal region (3). The lower pelvic organs and genitalia are innervated by fibers from the pre-sacral inferior hypogastric plexus, and these fibers are not readily blocked using paravertebral or transdiscal approaches (4). The inferior hypogastric plexus is the primary neural, autonomic coordinating center in the pelvis that integrates both parasympathetic and sympathetic output that receives input from the sacral level of the spinal cord (5, 6). The inferior hypogastric plexuses are formed by efferent sympathetic fibers from the hypogastric nerves and from pelvic splanchnic nerves, preganglionic parasympathetic fibers from pelvic splanchnic nerves, and visceral afferent fibers from pelvic viscera (7). The inferior hypogastric plexus block through the transsacral approach under fluoroscopy, using a local anesthetics/ steroid combination for the diagnosis and treatment of chronic pain conditions involving the lower pelvic viscera was first described by **Schultz** (4). Neurolysis of the inferior hypogastric plexus may be useful for perineal pain caused by cancer. We report two cases of cancer bladder and cancer cervix suffered of severe pain referred to the perineum that failed to be relieved by pharmacological treatment, they were successfully treated with neurolytic inferior hypogastric plexus block through transsacral approach.

2. Block Procedure

In both patients there was no contraindication for regional block (Coagulation disorder, local infection, sepsis, or mental disorder). They were informed about the procedure and its possible complications, and gave written consent. They admitted to the hospital ward. 18-G intravenous catheter was fixed; and received pre-procedural 1000 mL Lactated Ringer solution, then transported to the x-ray room, and received conscious sedation by midazolam 0.1 mg/kg and fentanyl 1ug/kg. Standard ASA recommended monitors will be used including electrocardiograph, blood pressure, pulse oximetry measurement.

Inferior Hypogastric Block procedure: trans-sacral approach as described by Schultz in 2007(6):

The patient is placed in the prone position on the x-ray table. Obtain an anterior-posterior scout view of the sacrum and then tilt the C-arm cephalad to view the sacral foramina "end-on" as circles or semi-circles on each side of the midline. Using fluoroscopy, mark an entrance point on the skin surface 1–2 cm lateral to the lateral edge of the S2 or S3 sacral foramen on the side to be blocked. Choose the foramen that is most easily visible. This block can be performed through S1, S2, S3, or S4 although S2 is usually the preferred access level after the skin has been cleansed, raise a wheal over the skin entrance site and infiltrate a path of anesthesia toward the targeted sacral foramen. Pass an appropriately bent 3.5 inch, 25-gauge spinal needle through the anesthetized track and advance it down to the lateral aspect of the dorsal sacral foramen until contact is made with bone. Advance the needle slowly and incrementally under fluoroscopic guidance through the dorsal sacral foramen toward the medial interior edge of the ventral sacral foramen until contact has been made with the medial bony edge of the ventral sacral foramen. If sacral paresthesia is encountered, retract and rotate the needle slightly to move past the sacral nerve root. A small, incremental dose (0.1 – 0.3 mL) of 1% lidocaine during needle advancement improves patient comfort without creating blockade of sacral nerve roots. Maneuver the needle along the medial edge of the ventral sacral foramen to exit the ventral foramen as medial as possible. Advance the needle anteromedially another millimeter toward the midline presacral plane and inject the contrast medium. If the needle is in the optimal position, the contrast should spread cephalad and caudad along the presacral plane conforming to the midline, ventral surface of the sacrum. When proper needle tip position is assured, we invented the injection of 6-8 mL of 10% phenol in saline in each side. If injected contrast and medication spread across the midline from the side of needle placement, then a unilateral block may be adequate. More commonly however, contrast spread is primarily unilateral, necessitating a bilateral needle placement for complete blockade of the right and left inferior hypogastric plexuses (Figures. 1, 2).

They were monitored during the block for haemodynamical parameters (Bl. pressure, HR, SpO2) during and after the block, then admitted to the postanesthesia intensive care unit for 24 hours after the block to be assessed for: The Visual Analogue scale (VAS) (VAS: 0 and 10 points were marked on a 10-cm length being 0 "no pain" and 10 being the "worst imaginable pain"), measured pre-procedural and at 30, 60 minutes, and 2, 6, 24 hours, 1, 2 and 4 weeks, 2 months after the procedure; The MST consumption pre-procedural and post-procedural at the first 24 hours at the PAICU, then on the follow-up visits; The time required to perform the block; Failed block will be defined as failure to lower the VAS by 50% of the pre-procedural measured VAS; Any complications during or after the procedure, especially (Transient paresthesia, rectal puncture, vascular penetration of one of the pelvic vessels, hematoma, and infection, dural puncture, bowel/bladder dysfunction, pain on injection. No hypotension from the sympathetic block or any other complication recorded during or after the procedure performance. They were discharged after 24 hours, and to be followed up for the next two months. For the first 2weeks, the patient will be followed up every week, then every other week to the end of the two months

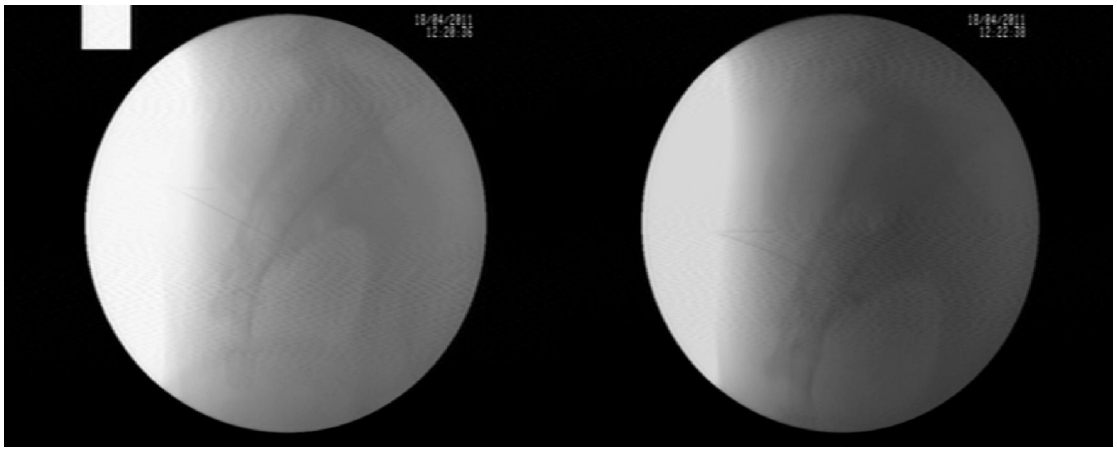

Figure (1): shows the advancement of the needle through the dorsal sacral foramen towards the medial interior edge of the ventral sacral foramen.

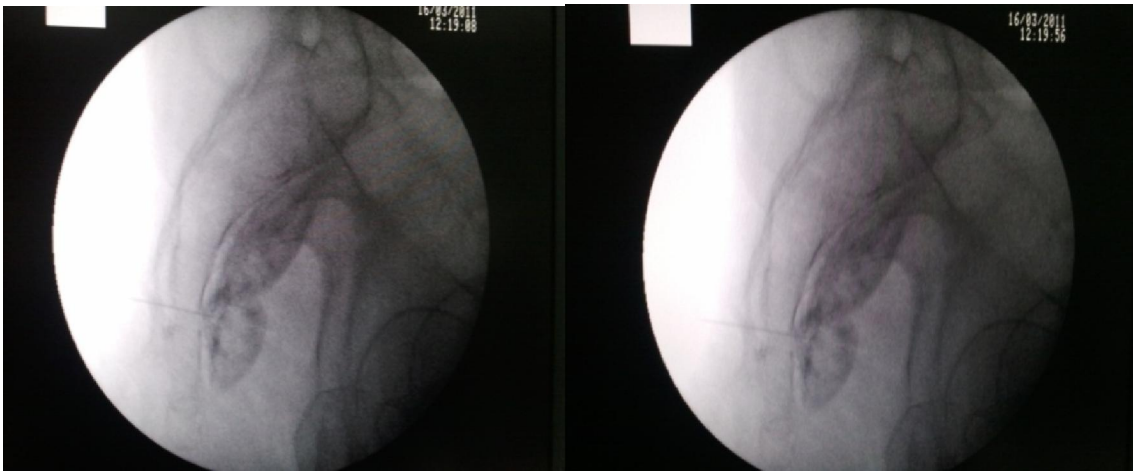

Figure (2): Shows the successful spread of the dye and phenol after bilateral trans-sacral injection.

3. Case Reports

Case 1

A 65-year-old man complained of sever persistent perineal and penile pain over the last 2 months, that over added to his lower pelvic pain. He described his pain as sharp, burning, localized to the perineum and penis, and not related to micturation. He had inoperable cancer bladder. He received palliative radiotherapy 4 months before the block. His pain score was 8 on 10 grades VAS system at admission, he was receiving daily dose of oral morphine sustained release tablets (MST 30 mg) 150 mg , Pregabalin 600mg, and amitriptyline 25mg, which failed to relieve his pain, in addition to the unacceptable side effects including nausea, vomiting, and constipation. The block procedure consumed 30 minutes to be performed. After performing the inferior hypogastric plexus block, the VAS was reduced to 3 after 1 hour, 2 after 6 hours, and 0 at 24 hours; which persisted to the end of the first month after the block. The oral morphine was stopped completely. After two months the VAS was 1 (intermittent very mild pain in the lower pelvis that was relieved by NSAIDs (Ibuprofen 400mg and Pregabalin 100mg on demand). He survived 4 months after the block with good pain relief and no further blocks were required, with no complications recorded during or after the block.

Case 2

A 62-year-old woman that was suffering of severe vulvodynia and anal heaviness over the last 3 months. She described her vulval pain as stabbing and electrical pain in the vulva. She had cancer cervix that was metastasizing to rectum and ovaries. She finished her palliative chemotherapy and radiotherapy 2 months before the block. Her pain score was 8 at admission, in spite she was on transdermal fentanyl patch releasing 200ug/hr, gabapentin 1200 mg/ day, and celecoxib 300 mg/ day, her pain was not relived and she had severe nausea and sedation (grade -3: Moderate sedation Movement or eye opening to voice (but no eye contact) on Richmond Agitation Sedation Scale) due to her medication. The block was performed in 25 minutes. Her VAS was reduced gradually after the block to reach 5 after 6 hours, 2 after 24 hours, one week, 2 weeks, and 4 weeks. At 8 weeks post-procedure her pain score reached 3, and she was on celecoxib 200 mg/day and gabapentin 400 mg/ day, while she stopped opioids at all. Her anal heaviness was disappeared completely. She died 10 weeks after the block procedure. No complications occurred during or after the block.

4. Discussion

Both patients underwent the inferior hypogastric plexus block had a successful pain score reduction of more than 50% after the block, with no complications occurred during or after performing the block. Sympathetic neurolysis is effective and safe for treatment of pancreatic and pelvic visceral pain in cancer, and is a useful adjunct to oral therapy (8, 9). It should be offered as an adjuvant to reduce analgesic consumption, however, opioids have long been used in treatment of the pelvic pain associated with cancer, but tolerance and/ or unpleasant side effects can develop (10). Despite recent refinements in the technique of hypogastric plexus blockade, the lower pelvic organs and genitalia are innervated by fibers from the presacral inferior hypogastric plexus and these fibers are not readily blocked using paravertebral or trans-discal approaches (4). The bilateral inferior hypogastric plexuses are interconnected networks of nerves that lie within the presacral tissues which lie along the anterior surface of the sacrum medial to the foramina sacralia on either side of the rectum ventral to the S2, S3, and S4

spinal segments (**11, 7**). Schultz was the first to introduce the inferior hypogastric plexus block through the trans-sacral approach, when perform the block on 11 patients with chronic benign pelvic pain conditions. He observed a success rate of 73% when performed 15 blocks on 11 patients, with VAS pre- and post-procedure mean score(SD) of 7.4(2.3) and 5.0(2.7) respectively. Regarding the risk of rectal injury during the block procedure, in case of inferior hypogastric plexus block it may occur if the needle advanced too deeply into the presacral tissue, and it can be easily avoided by careful visualization of the needle depth, using the lateral fluoroscopy; as the rectum is separated from the ventral surface of the sacrum by distance greater than 1mm (4). Transient paresthesia is the most common adverse event faced Schultz during transsacral blockade of the inferior hypogastric plexus, occurring in approximately 5% of the procedures performed. The sacral spinal nerves, with their dorsal and ventral rami, course in close proximity to the advancing needle and may be occasionally contacted by the needle tip, and it was encountered by injection of low dose of local anesthetic and by needle steering around the nerve. Rectal puncture is possible if the needle tip is advanced too deeply into the pre-sacral tissues. This should be easily avoided by visualizing the needle depth using lateral fluoroscopy as the needle tip emerges from the ventral sacral foramen. The space between the ventral surface of the sacrum and the rectum is typically greater than 1 mm and the needle tip need only be advanced slightly past the ventral edge of the sacrum. We think that the newly introduced inferior hypogastric plexus block can be a good alternative treatment for treatment of lower pelvic and perineal pain related to cancer, that require to be reevaluated in large well-controlled series to establish the efficacy and safety of the new block.

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