

# Superior Hypogastric Plexus Block for Malignancy Related Pelvic Pain - Retrospective Study in Tertiary Cancer Hospital

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**Abstract:** ***Objective:** Superior hypogastric plexus block (SHPB) is performed to provide pain relief caused by cancers related to pelvic organ. In this study we evaluate the efficacy of fluoroscopic guided SHPB by measuring pain relief and reduction in total morphine consumption. **Method:** This is a retrospective, observational study with study group consisting of 42 patients suffering from severe pain caused by pelvic cancers who underwent neurolytic superior hypogastric plexus block. We compared pain scores and morphine consumption before procedure and after procedure. We also assessed pain free period and adverse effects post procedure. **Results:** There was significant reduction in pain scores post procedure ( $2.5 \pm 0.77$ ) when compared to pre procedure pain scores ( $7.86 \pm 0.61$ ) ( $p < 0.05$ ). With duration of pain relief  $5.27 \pm 2.75$  months. Morphine consumption was also significantly reduced compared to pre procedure requirement ( $p < 0.05$ ). **Conclusion:** The study concludes superior hypogastric plexus block reduces sympathetically mediated chronic pain caused by pelvic malignancies with reducing the burden caused by morphine consumption. It is a minimally invasive procedure with low incidence of adverse effects.*

**Keywords:** superior hypogastric plexus block, pelvic pain, cancer pain, morphine, neurolysis

## 1. Introduction

Abdominopelvic pain in patients with cancer can present as a syndrome with somatic, visceral, and neuropathic mechanisms.<sup>1</sup> The viscera of the pelvis are supplied by sympathetic and parasympathetic nerves that contain both afferent and efferent fibers. The plexus contains sensory fibers transmitting painful or nociceptive impulses. Sympathetic and parasympathetic fibers descend and pass through the plexus to supply the pelvic organs.<sup>1</sup>

The superior hypogastric plexus (presacral plexus) is a retroperitoneal structure located bilaterally at the lower third of the L5 vertebral body and upper third of the S1 vertebral body at the sacral promontory and proximity to the bifurcation of the common iliac vessels<sup>2</sup>

Considering cancer pain mechanisms to be complex due to disease progression, neurolytic sympathetic block should be considered as an adjunct for adequate pain control. There are various guidelines recommending interventional techniques for treating cancer pain<sup>3,4</sup>.

Plancarte et al<sup>5</sup> was first to describe the superior hypogastric plexus block using blind percutaneous technique. SHPB is performed by various imaging technique.<sup>6-10</sup> The common approaches are the transdiscal, posterior paravertebral, and the anterior approach.<sup>11</sup>

In our study we evaluated the pain relief provided by SHPB in 42 patients suffering from chronic pelvic pain caused by malignancies of pelvic origin.

## 2. Methodology

This is a retrospective, observational study evaluating patients who underwent superior hypogastric plexus block (SHPB) for malignancies related to lower abdomen and pelvic organs from the period of 2019 to 2021.

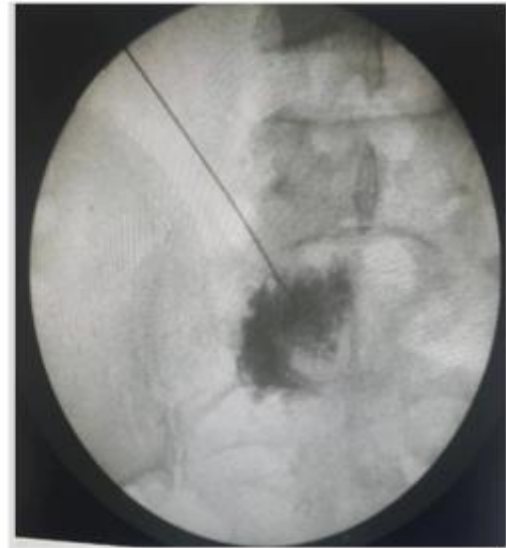
### Patient selection:

**Inclusion criteria:** patients with pain score of  $>7$  on Numerical Rating Scale.

**Exclusion criteria:** non cancerous pelvic pain.

## 3. Procedure

Pre - procedural diagnostic block is done in patients before neurolysis, patient is later posted for neurolytic procedure if he/she has  $>60\%$  pain relief. After confirming Nil by mouth status and obtaining informed consent, Intravenous access secured, ASA monitoring was placed. Patient was positioned in prone position. Intravenous antibiotic was given. With fluoroscopic guidance, L5 - S1 interdiscal space was identified. With 25 - 30 degrees oblique tilt until the spinous processes are seen to pass laterally and the facet line is visualised, The needle entry point is marked at the skin which is 5-7 cm from the midline. After infiltrating the skin with local anaesthetic, 22G, 15cm needle is inserted into the L5 - S1 intervertebral disc, the needle is inserted upto anterior border of L5 - S1 intervertebral disc to the prevertebral space. After confirming dye spread in lateral and antero - posterior view, (fig 1 a, b) 5ml of 60 - 70% alcohol was injected.



One ml air is injected before withdrawing the syringe and 50mg of inj ceftriaxone was injected inside the disc before withdrawing completely.

Post procedure, patient was monitored for a minimum of 2 hours to observe for any immediate complications like hypotension. Side effects were noted and managed promptly.

#### Assessment:

##### Primary Outcome measure:

Post procedure pain relief compared to pre procedure pain scores. Pain intensity was measured and noted pre - procedure and post procedure during weekly follow up visit. Pain scores were measured according to numerical rating scale ranging from 0 (no pain) to 10 (extreme pain).

##### Secondary outcome measures:

Pre - procedural and post procedural morphine requirement.

Pain free period

Adverse effects were also documented.

Demographic details, diagnosis were also recorded.

#### 4. Statistical Assessment

We used SPSS for Windows, version 16 (Chicago, IL) for the statistical evaluation of data. The line charts were demonstrated with Microsoft Excel 2010. Qualitative variables were presented as number and percent. Quantitative data were presented as mean  $\pm$  standard deviation (SD). Student paired T test was used to compare pain relief in patients undergoing SHPB and Chi square test for comparing morphine requirement during the pre procedure period and post procedure period. Our study consists of 42 patients presenting with pelvic visceral pain with an average age of 52 years. (fig 2)

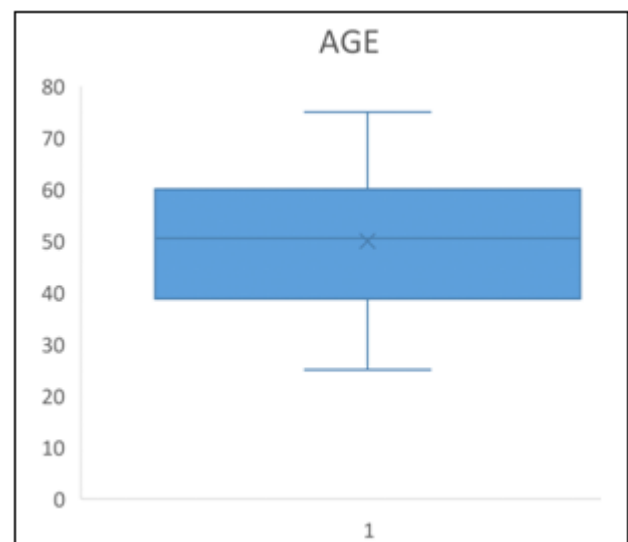


Figure 2

In our study, pre - procedure, 31 patients had severe pain (NRS 8 - 10) and 11 patients had moderate pain (5 - 7). Post procedure there was excellent pain relief in 20 (75% - 100% reduction) and good pain relief in 22 patients (50 - 75% reduction). the mean baseline NRS score of the patients was  $(7.86 \pm 0.61)$  which decreased to  $(2.5 \pm 0.77)$  Post procedure, pain relief was statistically significant ( $p < 0.05$ ). (fig 3)

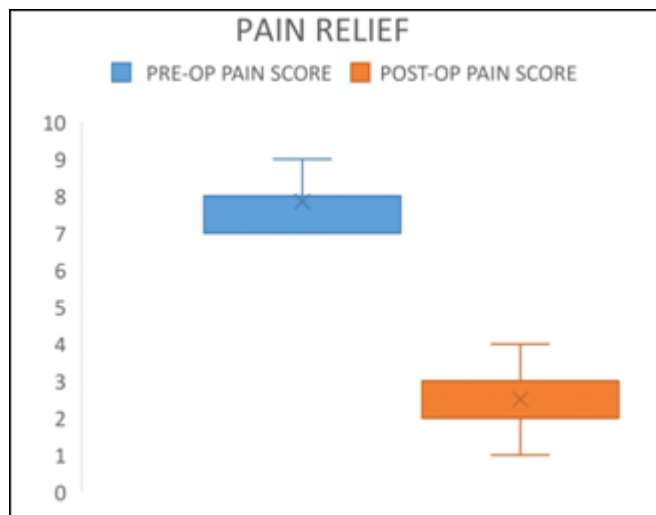


Figure 3

All patients in our study group had inadequate pain relief in spite of maximum morphine dosage during pre - procedure period whereas only 10 patients required oral morphine after procedure. Morphine requirement post procedure was significantly reduced (P value <0.05). Duration of pain relief was  $5.27 \pm 2.75$  months. No major complications were observed during or post procedure. No major adverse effects were observed in these patients.

## 5. Discussion

Patients suffering from Cancer pain routinely require chronic opioid treatment which may not only provide insufficient pain relief but also has various side effects such as constipation, drowsiness, opioid induced hyperalgesia, respiratory depression and addiction. It also affects quality of life. Interventional techniques provide an added tier of treatment and may help to reduce the requirement for chronic opioid use. SHPB is believed to be an efficient treatment for chronic pelvic pain. Two approaches described so far, both under fluoroscopy, have seen similar results. More recently, ultrasound and CT - guided procedures have also been described with similar success. The injectate includes local anesthetic, steroids, and neurolytic agents such as phenol or ethanol.<sup>12</sup> Various other options include intrathecal opioid therapy, midline myelotomy which have their own drawbacks.<sup>13</sup>

Several studies have demonstrated the efficacy of SPHB Cancer related pelvic pain. Plancarte et al.<sup>5</sup> first reported a study of 28 patients who underwent SHPB via the paravertebral approach with 6–8 mL of 10% phenol on each side. The study observed average pain reduction of 70%.

Similarly, De Leon - Casasola et al.<sup>14</sup> reported that 69% of 26 patients experienced significant pain reduction for more than three weeks after SHPB via the paravertebral approach with 8 mL of 10% phenol on each side.

In a different study, Plancarte et al.<sup>15</sup> examined 115 patients who underwent SHPB using the same approach and the same amount of phenol. The results showed 72% of patients expressed a good response after one or two neurolytic

procedures and a significant reduction in opioid usage at three - month follow - up.

Similar to the above studies, our study showed a significant pain relief (p value <0.05). With all patients who underwent SHPB having good to excellent pain relief.

Rocha A et al.,<sup>16</sup> conducted a retrospective, longitudinal, descriptive study with a study group of 180 patients diagnosed with pelvic cancer pain who underwent fluoroscopic guided classic or paravertebral approach of SHPB resulted in a sustained and significant VAS reduction that was 49.55% at 3 months. A significant reduction in opioid consumption of 12.55% was found at 3 months. Likewise, in our retrospective, descriptive study, there was significant pain relief and reduction in opioid consumption.

Hou S et al.,<sup>17</sup> retrospectively analysed 46 patients who underwent SHPB for cancer related pelvic pain. All 46 patients showed a significant reduction in pain score from 6.9 to 5.6 at visit 1 (P <0.01). Thirty of the 46 patients continued to complete visit 2 follow - up, and the NRS score was consistently lower at 4.5 at visit 2 (P <0.0001), with anxiety and appetite improved significantly.

Gamal G et al.,<sup>10</sup> in their study of 30 patients compared classical approach and transdiscal approach for SHPB, the study concluded that the transdiscal approach for superior hypogastric plexus block in pelvic cancer pain is easier, safer, and more effective with less side effects than the classic approach. In our study we performed transdiscal approach for all our study patients.

Ghoneim AA et al.,<sup>7</sup> compared CT guided SHPB and classic fluoroscopic guided posterior approach and concluded that Visual analog scale and morphine consumption decreased significantly in both groups at the measured times after the block compared with the baseline in the same group with no significant difference between both groups. In our study, we used fluoroscopic guided SHPB, the NRS pain score was significantly reduced and also morphine consumption was significantly reduced as compared to baseline consumption.

Mishra et al.<sup>18</sup> showed efficacy of an ultrasound - guided anterior - approach SHPB in a randomized trial of 50 patients with advanced malignancies. The study concluded that there was a significant decrease in visual analog scale (VAS) scores from baseline in Group Receiving US guided SHPB block (P < 0.05). The daily morphine consumption was also decreased in the study group. In our study, we performed fluoroscopic guided posterior transdiscal approach. We achieved pain relief in all study patients and significant reduction in morphine consumption after procedure.

Koyyalagunta D et al.,<sup>19</sup> in their retrospective study compared the efficacy, duration of benefit, and incidence of complications with alcohol vs. those of phenol in patients who underwent splanchnic nerve neurolysis. The study concluded that there was no significant difference in pain outcome and complications related to procedure. In our study we used Alcohol as the neurolytic agent.

Superior hypogastric plexus block provides long - lasting relief in many patients, regardless of approach. Evidence level is limited, and further RCTs could help provide better tools for evaluation and patient selection.<sup>12</sup>

## 6. Limitations

We only assessed pain scores (NRS) and morphine consumption but did not document quality of life or functional outcome. Patient survival was limited due to progressive nature of cancer.

## 7. Conclusion

Since prolonged use of opioid is required among patients with malignancies, there may be several adverse effects with long term use and high doses. Sympathetic blocks such as SHPB can act as an effective adjuvant and can reduce opioid consumption. Further studies with prospective, randomised study designs are needed to give a better understanding on Superior hypogastric plexus block.

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