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Prospective Evaluation

# Transsacrococcygeal Approach to Ganglion Impar Block for Management Of Chronic Perineal Pain: A Prospective Observational Study

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**Background:** The ganglion impar or ganglion of Walther is a solitary retroperitoneal structure at the level of sacrococcygeal junction. It provides the nociceptive and sympathetic supply to the perineal structures. Chronic Perineal Pain (CPP) has been effectively managed by ganglion impar block. In this study we analyze the feasibility, safety, and efficacy of ganglion impar block by transsacrococcygeal approach.

**Design:** An observational report.

**Methods:** In this prospective study, 16 consecutive patients who required ganglion impar block for CPP were followed for two months. After informed and written consent, the ganglion impar was blocked under aseptic precautions, using a transsacrococcygeal approach. The Visual Analogue Scale for pain (VAS) at presentation time required for the pain to reduce by 50% to be considered effective and VAS was recorded at different time points during 2-month follow-up, and time required to perform the procedure, number of attempts, and any complications were also noted.

**Results:** All the blocks were effective with a mean duration of 12±3 minutes for 50% reduction in VAS. The mean duration required to perform the procedure in neurolytic block patients was 7.8±2 minutes and 5.7±1minutes in therapeutic block patients. There were no adverse events. All the patients had significant pain relief during 2 month follow-up ($P$ <0.05 compared to baseline). The mean VAS at 2 months was about 2. Statistical analysis was done by using paired "t"/Wilcoxon signed rank test.

**Conclusion:** A transsacrococcygeal approach for a ganglion impar block is a technically feasible and safe technique. We recommend this technique for neurolysis or radiofrequency ablation of the ganglion impar and for diagnostic blocks, especially when the diagnosis and further plan of management is dependent on the response of the diagnostic block.

**Key words:** Sympathetically mediated perineal pain, ganglion impar block, transsacrococcygeal approach

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Perineal pain is a common problem, especially in females (2:1), which produces a great degree of functional impairment and frustration to the patient and a challenge to the treating physician. The diversity of presentation and etiology increases the complexity of the issue. The presentation may be an acute or chronic perineal pain. Chronic Perineal Pain (CPP) is a pain syndrome with either a somatic or sympathetic component. A proper history and physical examination can be useful tools to delineate the sympathetic or somatic component of CPP. 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 (1). The etiology for CPP may range from benign causes like chronic prostatitis and chronic proctitis to malignant causes like carcinoma of the pelvic organs. Infrequently the cause of pain may be idiopathic. The management of CPP involves a multimodal approach with the primary goal directed towards maximal achievable functional restoration and significant reduction in severity and intensity of pain (2).

Interventional techniques have been a great boon in the management of this pain syndrome. Among the interventional techniques, neurolysis of the pelvic nerves is the main modality of treatment. A blockade of nociceptive and sympathetic supply to the perineal region, supplied through the ganglion impar (Ganglion of Walther) (Fig. 1) has been shown to benefit patients with CPP (3). Plancarte et al (4) described the conventional technique for a ganglion impar block using a curved spinal needle. The transsacrococcygeal approach for a ganglion impar block was described by Wemm and Saberski (5) was developed to improve the technical feasibility and overcome the associated risk of visceral injuries with a conventional technique. We hereby present a prospective study aimed at analyzing the technical feasibility, safety, and the efficacy of a transsacrococcygeal technique for the ganglion impar block used in patients with CPP.

## Methods

Sixteen consecutive patients with Chronic Perineal Pain (CPP) due to varying etiologies, who underwent therapeutic/neurolytic ganglion impar blocks by the transsacrococcygeal technique, were included in the study. The efficacy of the ganglion impar blockade was confirmed prior to the therapeutic block/neurolysis using 10mL of 0.25% bupivacaine. A transsacrococcygeal approach was used for these diagnostic blocks. Therapeutic block/neurolysis was performed only in those patients who had a good response (i.e. VAS) with pain reduced by 50% after the diagnostic block. Patients with a cancerous etiology were given a neurolytic block and those with non-cancerous etiologies were given a therapeutic block.

The therapeutic/neurolytic ganglion impar block was performed following written informed consent meeting Helsinki requirements. The patient was placed in the prone position with a pillow beneath the lower abdomen. The site of the needle insertion was located by palpating the sacral cornu and by using a fluoroscope after aseptic preparation. A wheal of local anesthesia was raised at the site of the needle insertion. Under the guidance of a fluoroscope C-arm in a lateral position, a 22-gauge type B beveled, 5cm needle was inserted through the skin piercing the dorsal sacrococcygeal ligament at the midline. The needle was then advanced through the vertebral disc until the tip was placed anterior to the ventral sacrococcygeal ligament, felt as a loss of resistance. The position of the needle tip was confirmed by injecting 1mL of radio opaque dye into the retroperitoneal space. The spread of dye gives a "reverse comma" appearance when seen in a lateral view (Fig 2). Once the position of the needle tip was confirmed the desired drug was injected. The therapeutic block was performed by injecting 0.25% bupivacaine and 40mg of methylprednisolone acetate (10mL) and the neurolytic block was performed with 4–6mL of 8% aqueous phenol.

The time taken to perform the block, the number of attempts, and any complications during the procedure were noted. The block was considered effective if the VAS for pain decreased by 50% from the baseline. The time required for the VAS to reduce by 50% was noted. The VAS score was noted at 30 minutes after the block and a repeat block was planned if the patient did not have pain relief of 50% or above at this point. In the patients with an effective block, the VAS score was noted at 2 hours and 6 hours after the block. The patient was then discharged and the VAS score was noted by telephone conversation at 12 hours and 24 hours. Patients were followed for next 2 months. For the first 2 weeks, patients were asked to report every week and then every other week for 2 months. Patients were instructed to report at any time if there was a resurgence of pain with a VAS score of 5 or above.

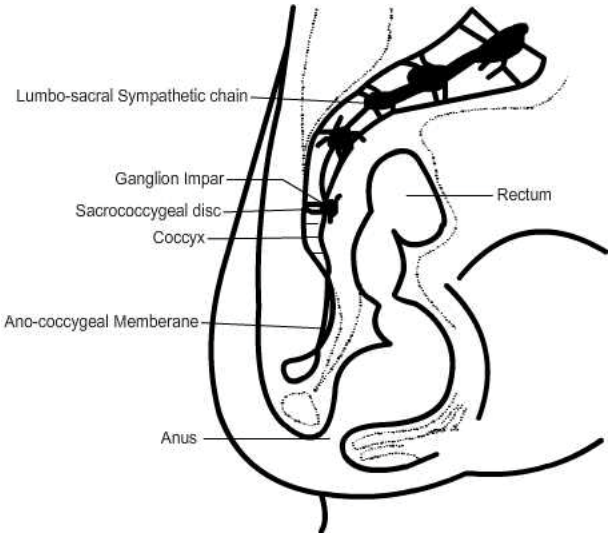


Fig. 1. *Anatomy of ganglion impar (lateral view).*

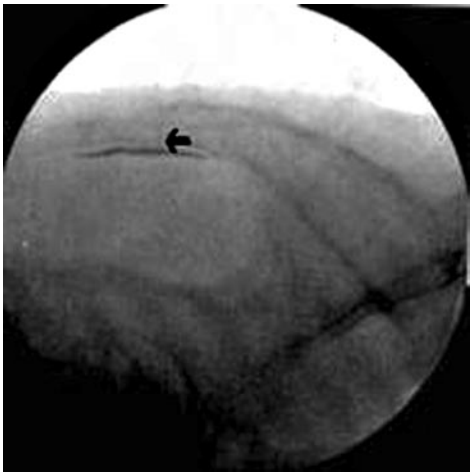

Fig. 2. *View of spread of dye in transsacrococcygeal approach.*

## Results

A total of 16 consecutive patients who underwent ganglion impar blocks were the subjects of this study. The various etiology of CPP in our study and the drug used for the block are shown in Table 1. Male to female ratio in our study was 31% to 69% respectively (M:F=1:2) (Table 1). The mean age of the patients in the neurolytic block and therapeutic block groups was 53.4±14.78 and 31.5±1.89 years respectively and the mean VAS for pain at presentation in neurolytic block and therapeutic block groups was 9.2±0.98 and 8±0.81 respectively (Tables 2 and 3). Among these patients, 1 patient had good pain relief after the block for 6 months but had a recurrence after 6 months and hence the block was repeated in this patient with good response (Table 1). One of our patients was lost to follow-up. He had a moderate response (VAS >4 at second week) and was scheduled for a repeated block at the sixth week (Table 1). In most of our patients, the block was performed in a single attempt and no difficulty was encountered during the procedure. In 3 elderly patients the puncture of the sacrococcygeal ligament was difficult due to the calcification of the ligaments (Table 1). In these patients an 18-=gauge, 1.5-inch needle was advanced until it pierced the deep dorsal sacrococcygeal ligament. Then a 22-gauge spinal needle was passed thorough the 18-gauge needle and positioned in front of the ventral sacrococcygeal ligament.

The mean duration of the procedures was 7.8±2.23 and 5.7±1.11 minutes in the neurolytic and therapeutic block groups respectively (Tables 2 and 3). None of our patients had any complications. All the patients responded well to the block (i.e. pain was reduced by 50% or above within 30 minutes) and the mean duration for the decrease in the intensity of pain to 50% of the baseline was 12±3.4 and 12±2.1 minutes in the neurolytic and therapeutic block groups respectively (Tables 2 and 3). The VAS for pain after the blocks was compared at different time points with VAS for pain at presentation. The reduction in the pain scores was statistically and clinically significant at all the time points in all the patients except one patient who was lost to follow-up after 4 weeks (Table 4).

Table 1. *Demographic data showing various etiology of CPP and drug used for block.*

| Patient ID | Age | Sex | Cause | Duration for performing procedure (min) | Number of Attempts | Time required to decrease the pain to <50% (min) | Drug used for block |
|---|---|---|---|---|---|---|---|
| 1 | 31 | F | Proctitis | 8 | 1 | 10 | MB |
| 2 | 34 | F | Idiopathic | 6 | 1 | 14 | MB |
| 3 | 32 | F | Proctitis | 5 | 1 | 15 | MB |
| 4 | 31 | F | Severe Coccygodynia | 5 | 1 | 10 | MB |
| 5 | 72* | M | Ca Sigmoid colon | 10 | 3 | 11 | NB |
| 6 | 39 | F | Ca cervix | 5 | 1 | 19 | NB |
| 7 | 65* | F | Ca rectum | 9 | 2 | 10 | NB |
| 8 | 60$ | F | Ca rectum | 11 | 1 | 15 | NB |
| 9 | 33 | M | Prostatitis | 5 | 1 | 10 | MB |
| 10 | 46 | F | Ca sigmoid colon | 6 | 1 | 15 | NB |
| 11 | 40 | F | Ca cervix | 6 | 1 | 10 | NB |
| 12 | 40 | F | Ca sigmoid colon | 7 | 1 | 8 | NB |
| 13 | 69*# | M | Ca prostate | 11 | 2 | 10 | NB |
| 14 | 63 | M | Ca Prostate | 5 | 1 | 8 | NB |
| 15 | 28 | F | Idiopathic | 5 | 1 | 13 | MB |
| 16 | 69# | M | Ca Prostate | 8 | 1 | 14 | NB |

* — patients who required multiple attempts
# — both are same patient
$ — patient who was lost to follow-up at 4th week
M — male: F— female (M: F = 31%:69%)
MB —therapeutic block with methylprednisolone with bupivacaine
NB —neurolytic block with phenol
CA – cancer

*Table 2. Descriptive Statistics for Neurolytic Block Group*

| NEUROLYTIC BLOCK | N | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Mean duration to perform the procedure (min) | 10 | 5.00 | 11.00 | 7.8 | ±2.23 |
| Time required to decrease pain by 50% (min) | 10 | 8.00 | 19.00 | 12.00 | ±3.41 |
| Age (year) | 10 | 28.00 | 72.00 | 53.4 | ±14.78 |
| VAS at presentation | 10 | 7.00 | 10.00 | 9.2 (≅ 9) | ±0.98 |

*Table 3. Descriptive Statistics for Therapeutic Block Group*

| THERAPEUTIC BLOCK | N | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Mean duration to perform the procedure (min) | 6 | 5.00 | 8.00 | 5.7 | ±1.11 |
| Time required to decrease pain by 50% (min) | 6 | 10.00 | 15.00 | 12.00 | ±2.08 |
| Age (year) | 6 | 28 | 34 | 31.5 | ±1.89 |
| VAS at presentation | 16 | 7.00 | 9 | 8 | ±0.81 |

Table 4. *Comparison of VAS for Pain at Different Time Point with VAS at Presentation*

| Compared Pair | Number of patients (N) | Avg. VAS at different time points | *P*-values* |
|---|---|---|---|
| VAS p – VAS 30 min | 16 | 1 | 0.000# |
| VAS p – VAS 2 hrs | 16 | 2 | 0.000 |
| VAS p – VAS 6 hrs | 16 | 2 | 0.000 |
| VAS p – VAS 12 hrs | 16 | 2 | 0.000 |
| VAS p – VAS 24 hrs | 16 | 2 | 0.000 |
| VAS p - VAS 1wk | 16 | 2 | 0.000 |
| VAS p – VAS 2 wks | 16 | 2 | 0.000 |
| VAS p – VAS 4 wks | 16 | 2 | 0.000 |
| VAS p – VAS 6 wks | 15 | 2 | 0.000 |
| VAS p – VAS 8 wks | 15 | 2 | 0.000 |

* *P*-value < 0.05% — statistically significant difference in VAS score before and after the block.
# — Paired "t" test was applied
VAS p — Visual Analogue Score for pain (VAS) at presentation
VAS 30, 2, 6, 12, 24, 1W, 2W, 4W, 6W, 8W — VAS for pain at 30 min, 2 hrs, 6 hrs, 12 hrs, 24 hrs, 1 wk, 2 wks, 4 wks, 6 wks, 8 wks after attaining 50% reduction in pain

### Statistical Analysis

The statistical analysis was done using the SPSS statistical package. The P-value of less than 5% was considered significant. Descriptive analysis was done for relevant data. The comparison of correlated variables was done using paired "t"/Wilcoxon signed rank test.

## Discussion

Chronic Perineal Pain has a diverse etiology and there are no definitive diagnostic criteria laid down. Neuropathic types of CPP are diffuse pain with spontaneous and evoked pains. There is a sense of urgency and a burning sensation present in this type of pain (1). The initiating factor in neuropathic pain is mainly damage to the tissue caused by either inflammation or nerve damage from an expanding tumor. This tissue/nerve damage produces a persistent input source for the pain pathway. There are changes seen at the various levels of the central nervous system like the spinal cord, supraspinal structures, and cortex that maintain neuropathic pain (2). The role of the sympathetic nervous system in this type of pain is still a controversial issue. Few of these patients respond well to sympatholytic blocks and are categorized to have Sympathetically Mediated Pain (SMP) (6).

The ganglion impar is a solitary retroperitoneal structure at the level of the sacrococcygeal junction. It marks the termination of the paravertebral sympathetic chain. A ganglion impar block can be used to treat CPP. A diagnostic ganglion impar block with local anesthetic can be given to confirm the efficacy of the block. The pain relief may be due to a blockade of nociceptive as well as sympathetic fibers. If considerable pain relief is achieved, long-term relief in these patients can be achieved by using a neurolytic or therapeutic block.

Patt and Plancarte (3) first described a technique to block the ganglion impar. In this conventional transanococcygeal membrane technique a 22-gauge, 8cm spinal needle, which is bent 5–7cm from the tip in order to facilitate positioning near the ganglion, is used. The spinal needle is directed cephalad through the anococcygeal ligament. To prevent accidental perforation of the rectum by the needle, continuous rectal examination by the operator with the index finger of his non-dominant hand is recommended. This method is technically difficult and also involves the risk of injuring the rectum and blood vessels and has a high

degree of failure, about 20–30%, in our experience.

However, there is no literature on this issue. In addition, rectal perforation can cause contamination of the needle and increase the risk of needle stick injury to the operator's finger in the rectum. Nebab and Florence (7) described a modified needle geometry to overcome the disadvantages of the manually bent needle. However, there is still a risk of needle breakage, and most importantly, a risk of failure to attain the midline orientation. A paramedian approach (8,9) has also been described. In our experience, it carries similar risks as that of the classical approach.

The transsacrococcygeal approach to the ganglion described by Wemm and Saberski (5) is technically feasible and easy to learn and perform. However, the 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 (10). This may lead to difficulty in placement of the needle as we encountered in 3 patients in our series. The potential complications after penetration of the disc are discitis and bleeding (11). In order to overcome this problem Munir et al (12) described a needle inside needle technique. In our study, we used an 18-gauge needle to facilitate the penetration of a 22-gauge spinal needle through the ossified disc in 3 of our patients. There were no complications seen with transsacrococcygeal technique using a 22-gauge, 5cm needle. None of the patients in their 2-month follow up complained of back pain.

The transsacrococcygeal approach is technically feasible as most of our patients required only 1 attempt and the mean duration required to perform the block was 7±2 minutes. Reid et al (13) have also shown that transsacrococcygeal approach is technically feasible in the radiofrequency ablation of the ganglion impar.

## Conclusion

We recommend the transsacrococcygeal technique examined in this study for local anesthetic block of the ganglion impar, especially when the diagnosis and further plan of management is dependent on the response of the diagnostic block. We also recommend this approach for neurolysis or radiofrequency ablation of the ganglion impar in view of the direct course and a clinically appreciable end point. Larger studies with randomized control groups would improve the level of evidence of the findings in this study.

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