

Study of ilioinguinal, iliohypogastric and genitofemoral nerve block by blind localization through anatomical landmark for inguinal hernia repair at a tertiary hospital

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Abstract

Background: When combined with iliohypogastric and genitofemoral nerve block, ilioinguinal nerve block can also be utilized to provide surgical anaesthesia for inguinal hernia repair, post operative pain relief and have minimal hemodynamic effects. Aim of the study was to evaluate the efficacy and safety of the ilioinguinal nerve (IIN) and iliohypogastric nerve (IHN) and genitofemoral nerve (GFN) block using landmark technique for day care inguinal hernia repair. **Material and Methods:** Present study was prospective, observational study, conducted in 18-60 years, male patients, ASA I and II, listed for elective hernia repair, fit for surgery. **Results:** 30 patients were considered for study, all were male, mean age was 48.1 ± 18.51 Years, mean weight was 66.18 ± 12.8 kgs, ASA class I were 70 %, class II were 30 %/ and mean duration of surgery was 60.5 ± 22.43 min. In present study, Onset of sensory blockade was 11.2 ± 1.07 min and duration of sensory blockade was 307.8 ± 82.5 min. Mean period taken for ambulation was 317.8 ± 67.5 min. Mean duration of post-operative analgesia was 439.9 ± 83.7 min. The nerve block was successful in 29 patients and one was converted to GA. Only minor complication noticed was Transient minimal femoral sensory block (3.33 %). No peritoneal puncture, hematoma due to needle puncture, nausea and vomiting, urinary retention, LA toxicity and LA allergy was noted in present study. **Conclusion:** Landmark technique for ilioinguinal, iliohypogastric and genitofemoral nerve block provides excellent anaesthesia technique for day care inguinal hernia repair surgery.

Keywords: ilioinguinal, iliohypogastric, genitofemoral, nerve block, day care, inguinal hernia repair surgery.

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Received Date: 17/07/2022 Revised Date: 23/08/2022 Accepted Date: 06/09/2022

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Access this article online

Quick Response Code:	Website: www.medpulse.in
	DOI: https://doi.org/10.26611/10152331

INTRODUCTION

Repair of inguinal hernia is one of the most commonly performed procedures with most of them being performed on a day surgery center. Unacceptable level of pain will

produce tachycardia, hypertension, vasoconstriction and splinting of affected part and predispose the patient to develop increased incidence of chest infection, delayed mobilisation of patient, deep vein thrombosis, muscle wasting and pressure sore in postoperative period.¹ Ilioinguinal/iliohypogastric (II/IH) nerve block and transversus abdominis plane (TAP) block is getting more and more attention as viable alternatives to provide effective perioperative analgesia for inguinal surgery.^{2,3} Ilioinguinal nerve block has shown great utility as a diagnostic, prognostic, and therapeutic manoeuvre in the evaluation and treatment of groin and genital pain that is thought to be mediated via the ilioinguinal nerve. When combined with iliohypogastric and genitofemoral nerve block, ilioinguinal nerve block can also be utilized to provide surgical anaesthesia for inguinal hernia repair, post

operative pain relief and have minimal hemodynamic effects.⁴ Aim of the study was to evaluate the efficacy and safety of the ilioinguinal nerve(IIN) and iliohypogastric nerve(IIH) and genitofemoral nerve(GFN) block using landmark technique for day care inguinal hernia repair.

MATERIAL AND METHODS

Present study was prospective, observational study, conducted in Department of Anaesthesia, Jitiu's Indian Institute of Medical Sciences And Research Centre And Noor Hospital, Warudi, India. Study duration was of 1 year (January 2021 to December 2022). Study was approved by institutional ethical committee.

Inclusion criteria: 18-60 years, male patients, ASA I and II, listed for elective hernia repair, fit for surgery, willing to participate.

Exclusion criteria: Patients with ASA III---IV class, Allergy to local anesthetics, hemorrhagic diathesis and clotting disorder, Patients who refused to participate.

Study was explained and a written informed, valid consent was taken. All patients were familiarized with the Visual Analogue Score (VAS) preoperatively. To reduce needle prick pain, EMLA cream was applied prior at needle insertion site. Ilioinguinal, iliohypogastric and genitofemoral nerve block using landmark technique was performed. The spermatic cord was identified immediately lateral to the pubic tubercle. The area for injection,

including the scrotum, was sterilized. The spermatic cord was then stabilized and medialized using the non-dominant hand, and 5 ml of 1% lidocaine was injected, sub dermally, immediately lateral to cord, superficial to the bone. The injection was made at a point 2 cm medial and 2 cm caudad to the anterior superior iliac spine using a short-beveled needle advanced perpendicular to the skin

After an initial pop sensation as the needle penetrates the external oblique aponeurosis, around 5 ml of 1% lidocaine is injected. The needle was then inserted deeper until a second pop is felt penetrating the internal oblique, to lie between it and the transversus abdominis muscle. A further 5 ml of 1% lidocaine was injected to block the iliohypogastric nerve. A fan-wise subcutaneous injection of 3–5 ml used to block any remaining sensory supply from the intercostals and subcostal nerve. Negative aspiration prior to injection ensures non-penetrance of the peritoneum or femoral vessels. After injection of the solution, pressure is applied to the injection site to decrease the incidence of ecchymosis and hematoma formation.

Data was obtained for intraoperative pain, discomfort, and conversion to GA. Postoperative pain score was recorded using VAS score and postoperative complications were also recorded. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

RESULTS

30 patients were considered for study, all were male, mean age was 48.1 ± 18.51 Years, mean weight was 66.18 ± 12.8 kgs, ASA class I were 70 %, class II were 30 %/ and mean duration of surgery was 60.5 ± 22.43 min.

Table 1: Demographic Profile

Parameters	Value (No. of cases/ Mean \pm SD)
Age	48.1 ± 18.51 Years
Weight	66.18 ± 12.8 kgs
Gender (M/F)	30/00
ASA (I/II)	21/09
Duration of surgery	60.5 ± 22.43 min

In present study, Onset of sensory blockade was 11.2 ± 1.07 min and duration of sensory blockade was 307.8 ± 82.5 min. Mean period taken for ambulation was 317.8 ± 67.5 min. Mean duration of post-operative analgesia was 439.9 ± 83.7 min. The nerve block was successful in 29 patients and one was converted to GA. Only minor complication noticed was Transient minimal femoral sensory block (3.33 %). No peritoneal puncture, hematoma due to needle puncture, nausea and vomiting, urinary retention, LA toxicity and LA allergy was noted in present study.

Table 2: Anaesthesia characteristics

Parameters	Value (No. of cases/ Mean \pm SD)
Onset of sensory blockade	11.2 ± 1.07 min
Duration of sensory blockade	307.8 ± 82.5 min
Ambulation Time	317.8 ± 67.5 min
Post-operative analgesia	439.9 ± 83.7 min
Conversion to GA	1 (3.33%)
Complication	
Transient minimal femoral sensory block	1 (3.33%)

DISCUSSION

All anesthetic methods have been used for inguinal hernia repair surgeries. The choice of the anesthetic technique depends on its acceptability by the patient and surgeon, the feasibility and safety of the procedure, surgical method, medical history, comorbidities, and the cost. An ilioinguinal and iliohypogastric nerve block seems to be a simple and straight forward technique based on surface anatomy and visible skin landmarks. Anatomically, the sensory nerve supply of the inguinal region is from the T12–L2 nerves. The ilioinguinal and iliohypogastric nerves (branches of T12 and L1) are located between the internal abdominal oblique and transverse abdominis muscles just superior to the anterior superior iliac spine.⁶ In study by Elwany AF *et al.*,⁷ mean duration (in minutes) to require rescue analgesia was found to be 1003.2 ± 99.6 (min) in group A and 1317 ± 69 (min) in group B. In a comparison of these two values the difference in the meantime to rescue analgesic requirement was statistically significant ($p < 0.001$). IIN/IHN block delays the need for rescue analgesia and reduces the postoperative analgesic requirement compared to USG-guided TAP block.

In study by Singh SK, nerve block was deemed to be successful in 92% of the patients. In 8% of patients, conversion to GA was required. There was excellent analgesia postoperatively up to 12 h. All of the 92 patients were ambulatory within 4–6 h without any discomfort. IIN and IHN block in the TAP plane, supplemented with GFN block provides excellent anaesthesia technique for day case adult inguinal hernia surgery. Use of PNS increases the success rate, safety and helps in locating the nerves in the TAP.

Swati C *et al.*, noted that duration to perform ilioinguinal/iliohypogastric nerve block (Group I) was significantly longer (7.95 ± 0.461 minutes) than that of spinal block (Group II) (3.73 ± 0.679 minutes). Systolic and mean blood pressure showed statistically significant reduction in first 40 minutes with higher intraoperative fluid requirement in Group II patients (1280 ± 190.1 ml vs 348.33 ± 77.106 ml). Group I patients required higher dose of midazolam (3.00 ± 0.347 vs 2.23 ± 0.254 mg) ($p < 0.05$). Supplemental anaesthetic infiltration was required in 36.7% patients in Group I and 45.45% of them required propofol for sedation (55.56 ± 5.11 mg). The duration of postoperative analgesia was longer in Group I (5.163 ± 0.4542 vs 3.871 ± 0.4801 hours) ($p < 0.05$). Duration of ambulation was significantly shorter in Group I (3.95 ± 2.56 vs 9.58 ± 0.87 hours) ($p < 0.05$). Ilioinguinal/iliohypogastric nerve block can be a safe alternative to spinal anaesthesia for elective unilateral inguinal hernia repair. However, it has been reported that inguinal nerve block can have 10 to 30% failure rate when a blind technique is used.⁹ In addition, this technique may

result in complications such as peritoneal puncture, small or large bowel perforations, and femoral nerve palsy even in experienced hands.¹⁰ Combined iliohypogastric and ilioinguinal nerve blocks significantly reduce pain scores and supplemental analgesia after discharge following inguinal herniorrhaphy. When compared with spinal anaesthesia, these blocks are associated with a shorter time to discharge home, lower pain scores at discharge, higher satisfaction scores at 24-hour follow-up, and lower cost.¹⁰ These blocks have been suggested as an alternative anaesthetic technique for repair of strangulated hernia in high-risk patients who are not suitable candidates for general or neuraxial anaesthesia. This technique can successfully be utilised in patients who are not suitable for other modes of anaesthesia like neuraxial anaesthesia and general anaesthesia.

CONCLUSION

Landmark technique for ilioinguinal, iliohypogastric and genitofemoral nerve block provides excellent anaesthesia technique for day care inguinal hernia repair surgery. This technique is really helpful in setup where PNS and USG are not available. The potential benefits are lack of dependency on availability of hospital beds, greater flexibility of scheduling surgeries, reduced hospital infection, shorter waiting list, overall reduced procedural cost, recovery in a familiar environment and contribution to the economic growth of the nation.

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Source of Support: None Declared
Conflict of Interest: None Declared

