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RESEARCH ARTICLE

THORACOLUMBAR INTERFASCIAL PLANE BLOCK FOR POSTOPERATIVE PAIN CONTROL IN LUMBAR SPINE SURGERIES - A CASE SERIES

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Key words:-

TLIP - Thoracolumbar Interfascial Plane Block, TLIF - Transforaminal Lumbar Interbody Fusion Surgery, PONV - Postoperative Nausea and Vomiting

Abstract

Introduction: The lumbar Spine fusion surgery have serious acute pain postoperatively. This study aims at postoperative pain relief and to infer the intraoperative hemodynamic changes along with the ease of operation by the surgeon and the ease of performing the block by the anaesthetist. The procedure was carried out at our hospital in 10 patients requiring TLIF procedure. Written informed consent were obtained. All these patients were administered with TLIP block with general anaesthesia. A high frequency linear probe at L3 vertebral level, Patients were positioned prone and administered with 20ml of 0.25% bupivacaine and the drug was injected in the interfascial plane between the fascia of the longissimus and multifidus muscle on both the sides. All the patients were monitored postoperatively using the NRS pain score at different intervals for 24 hours.

Discussion: 8 out of 10 patients had pain relief for a period of 12 hours postoperatively without any opioid requirement. Intraoperative hemodynamics were well maintained in all the cases. Total requirement of opioids were reduced in both intraoperative and postoperative period. The ease performance was difficult for the two cases and surgeon also felt difficulty during instrumentation which required rescue analgesic postoperatively within less than 8 hours. No complications were reported in any of the operated cases.

Conclusion: TLIP block can be used as a good adjuvant to general anaesthesia for patients under spinal surgery

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Introduction:-

Spinal surgeries are the second most painful procedure postoperatively. Providing effective analgesia is essential for the patients postoperatively by preventing effects of pain on the body

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systems, which allows early mobilization, decreasing the duration of hospitalization and minimizing the risk of developing postoperative chronic pain syndromes. In recent times the interfascial plane blocks are being preferred as an effective and safer choice for postoperative multimodal pain management due to their long lasting analgesia, reduced opioid consumption and fewer motor blockade.

The thoracolumbar interfascial plane block (TLIP) is paraspinal by spreading between the fascia of the multifidus and longissimus muscles at the 3rd lumbar vertebra, the local anaesthetic agent used targets the dorsal branches of the thoracolumbar nerves. It has been observed to offer efficacious analgesic effects with focussed dermatomal coverage in the incision area in the spinal surgeries [1,2]

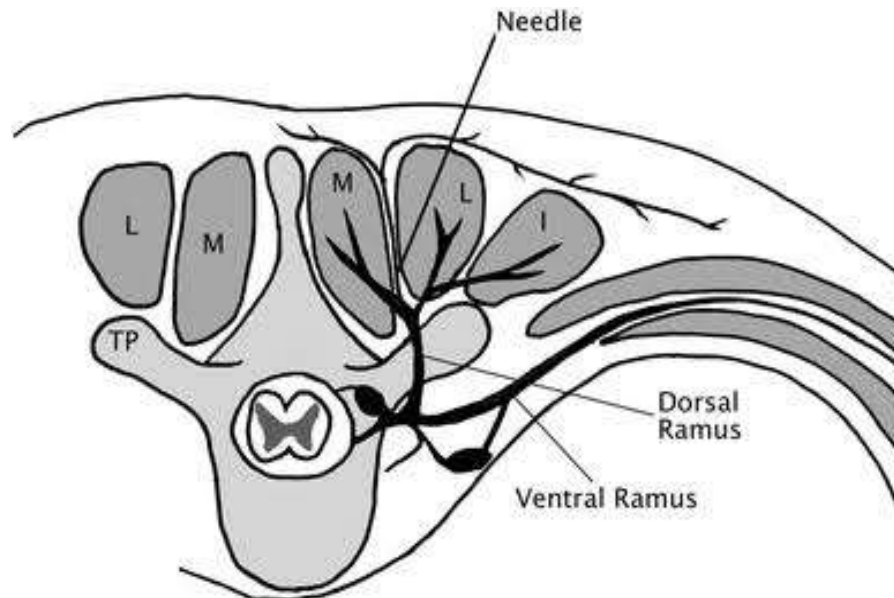


Figure 1:-Showing the crosssectional anatomy of paraspinal muscles[5].

AIM : This study aims at postoperative pain relief by performing TLIP block in TLIF surgery. This case series also tried to infer the intraoperative changes along with the ease of instrumentation by the surgeon and the ease of performing the block by the performing anaesthetist.

Methodology:-

All the patients involved in the study were explained about this study and written informed consent was obtained.

Total of 10 patients were included aged between 35-70 years in this study in which 4 were male and 6 were female belonging to ASA I-II with BMI < 30 posted for TLIF surgery.

Those patients with bleeding disorders, chronic opioid usage, psychiatric illness, infection at the injection site, hypersensitivity to local anaesthetic agents were excluded.

Data Collection

A standard preoperative and postoperative analgesia plan was applied to all patients who undergo general anaesthesia at our institute and a standardized data collection form was used to collect the patient data. The following data were collected for all patients undergoing TLIP block: age, gender, weight (in KG), height (in cm), surgical procedure, surgical time, use of routine and rescue analgesia and numeric rating scale (NRS) at 30 mins, 1st, 6th, 12th, 18th and 24 hours postoperatively.

Technique

Routine general anesthesia as per institutional protocol was administered . Premedication with injection glycopyrolate , midazolam intravenous followed by preoxygenation with 100%oxygen for 3mins. Induction with injection fentanyl 2mcg/kg , injection xylocard 1.5mg/kg and injection propofol 2mg/kg , intubation with inj.succinylcholine 2.5mg/kg and using 8 mm cuffed oral endotracheal tube for male patients and 7mm cuffed oral endotracheal tube for female patients . Position checked with 5 point auscultation and tracheal placement confirmed with capnography .Oral endotracheal tube secured and adequate padding for the eyes were given .
 For maintainence : 50:50 O2/N2O mixture at 4l/min and 2% sevoflurane and atracurium bolus of 0.5mg/kg followed by infusion at the rate 5ml/hour.
 Patient positioning : prone
 Performing the block :under sterile aseptic precautions

TLIP : a high frequency linear ultrasound frequency probe is used in a paramedian sagittal orientation approximately 2cm away from the midline (spinous process)

Identification Of Anatomical Landmarks: the spinous process is identified followed by the transducer is moved laterally to locate the transverse process.the needle inserted between the multifidus and longissimus muscle hydrodissection is done using 2-3ml normal saline followed by injection of 20ml 0.25% bupivacaine.(Figure 1 shows TLIP).the same technique is repeated on the other side. Intraoperative monitoring of vitals were recorded for every 15 minutes . Injection paracetamol intravenously was administered 30 minutes prior to the completion of the procedure All these patients were extubated on table without any complications.

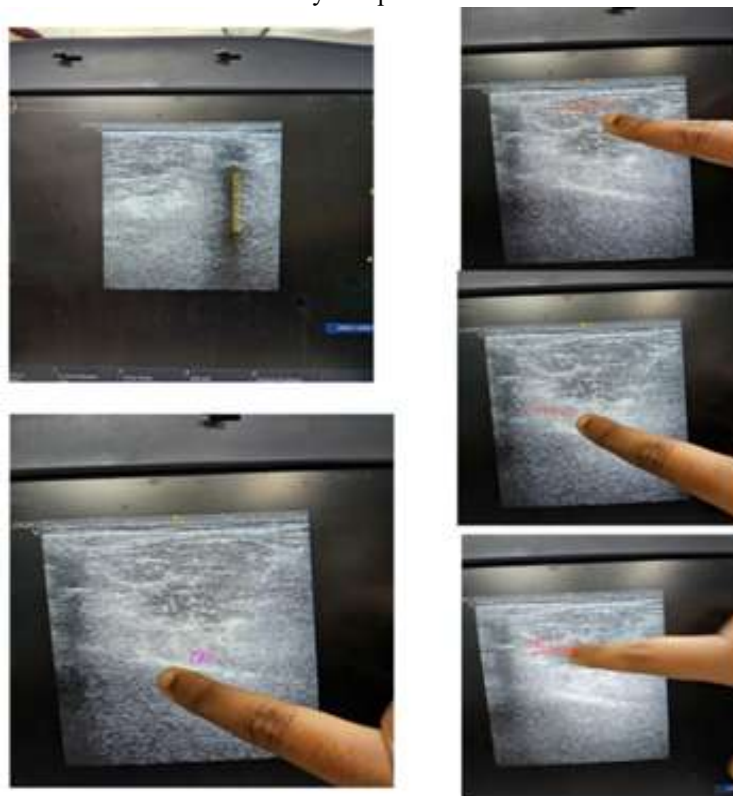


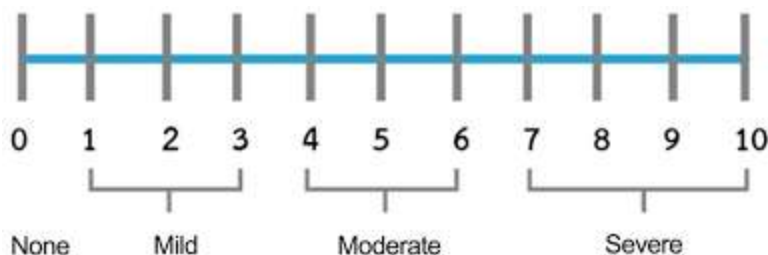
Figure 2:-Showing the ultrasound image of the TLIP block.

Results:-

All these patients were monitored postoperatively using 11 point NRS pain scale at 30mins , 1st hour , 8th hour , 12th hour and 24 hours . Image showing the nrs scale 0 – no pain, 1-3- mild pain ,4-6 – moderate pain ,7-9 – severe pain ,10- worst pain imaginable nrs score of 4 or more in recovery or the postoperative ward .

Injection tramadol 50-100 mg was supplemented .

Patient received 1g IV paracetamol every 8 hours (this was skipped if the NRS scores were less than 4)



Despite paracetamol if still the score is more than 4

Injection diclofenac sodium 75mg was administered

Patients with PONV were given 4 mg of ondansetron intravenously .

18 out of 20 patients had pain relief without any opioid requirement for 12 hours

2 patients were recorded with NRS pain score of more than 4 despite of intravenous paracetamol were administered with intramuscular diclofenac

Intraoperative hemodynamics were well maintained in all cases

No complications due to the block were encountered

Intraoperative Vitals

TRENDS	HEART RATE	SYSTOLIC BP	DIASTOLIC BP	MEAN ARTERIAL BP	SPO2	ETCO2
BASELINE	70-80	102-130	80-90	90-100	95-100	35-40
INDUCTION	80-90	130-140	90-100	100-110	98-100	30-35
MAINTAINENCE	70-85	120-135	80-95	90-105	98-100	35-40

reduced heart rate variability, improved oxygenation and stable blood pressure

Postoperative Pain Score

nrs	0-3	4-7	8-10
time 30mins	***** ×	*×	××
1 st hour	***** ×	×	××
8 th hour	*****××	×	×
12 th hour	*****××	××	
24 th hour	*****××	××	

* female patients

×male patients

Discussion:-

Conventional spine surgeries often involve extensive dissection of subcutaneous tissues , bones and ligaments resulting in high degree of postoperative pain and strikingly a high use of opioid analgesics [3]. In the early 2000s and mid 2010s one trial demonstrated opioid overusage in spine surgery with an increase in postsurgical opioid dependence from 0% to nearly 48% of patients who underwent surgical fusion for degenerative scoliosis[4].

The use of TLIP blocks during spine surgery has the possibility of providing better postsurgical pain control with the likelihood of decreasing the incidence of chronic pain .The novel technique of TLIP block was introduced by hand et al [5] . Several studies have demonstrated the efficacy of analgesic management for lumbar spine surgeries. Thoracolumbar interfascial plane block targets the thoracolumbar fascia which encompasses the lumbar spine providing effective analgesia . It also decreases the opioid consumption

and reduces its deleterious effects . effective pain releifs enables early mobilization , promoting early recovery .Conventional pain management strategies such as systemic opioids , NSAIDS and epidural analgesia may be effective but are not without limitations, including side effects and potential risks of complications [6]. TLIP block emerges as a novel approach for enhancing postoperative pain management following spine surgery as its significant reduction in postoperative pain intensity compared to non block care at various time points [7,8] , favorable safety profile with minimal risk of nerve damage or bleeding . This case series has been a trial to exclusively perform this block to know its outcome both intra and postoperatively .

Conclusion:-

TLIP block can be considered a good adjuvant to general anaesthesia for patients under spinal surgery as it provides adequate postoperative pain relief , reduction of the hemodynamic response to surgical stress .intraoperative instrumentation and operator performance and operator performance was also good .tlip in tlif is a valuable addition to the armamentarium of pain management .

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