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Case Report

Transient Neurodeficit Following Retrolaminar Plane Block in Lumbar Spine Fixation Surgery: A Case Report

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Abstract

Background: Retrolaminar plane block is a type of paravertebral block which provides effective perioperative analgesia in lumbar spine surgeries. It is a relatively safer regional anesthetic technique and very few complications have been reported in the literature. A case has been reported where there was unilateral motor weakness and hypoesthesia postoperatively which resolved within 28 hours.

Case: In this case report, there was a transient bilateral neurodeficit including motor weakness of the lower limbs, sensory impairment below the umbilicus and impairment of reflexes after a lumbar spine instrumentation surgery, due to administration of retrolaminar block. Imaging was normal. This is a very rare complication yet cannot be ignored. Though this event was distressing for both the clinicians and the patient, it got reversed spontaneously and completely within 7 hours after extubation.

Conclusion: This can be avoided by proper skilled training of the anesthesiologist, use of ultrasound, proper knowledge of the spinal anatomy, appropriate clinical examination, imaging and follow up.

Keywords: Lumbar Spine Surgeries; Retrolaminar Block; Epidural Spread; Paravertebral Spread; Motor Weakness; Sensory Impairment

Introduction

Spine instrumentation surgeries involve extensive amount of tissue and bone trauma. This results in significant perioperative pain. Effective analgesia for spine instrumentation surgery typically involves a multimodal approach combining systemic medications, regional nerve blocks, and patient-controlled analgesia (PCA). Different types of regional anesthesia techniques are employed to alleviate this pain. Retrolaminar block (RLB) is a new and simple approach of paravertebral block with laminar technique [1]. When the needle tip is contacted to the lamina, local anesthetic is injected over the vertebral lamina deep to the paraspinal muscles [1]. Analgesia is performed by blocking the paraspinal nerves with a local anesthetic drug that spreads between the deep paraspinal muscles and the vertebral lamina [2].

The local anesthetic spreads to the paravertebral area, epidural space and neural foramina [1]. This block has been used to provide analgesia in breast surgery, rib fractures, lumbar spine surgery, VATS, cholecystectomy, etcetra [3,4]. Here we report a case of a rare complication of this block in lumbar spine surgery.

Case Description

A 60-year-old male, known case of hypertension and diabetes mellitus, presented with lumbar 4-5 prolapsed intervertebral disc and lumbar canal stenosis for undergoing lumbar fixation and decompression. He was on oral antihypertensive medications(telmisartan 40 mg + hydrochlorothiazide 12.5 mg once daily), hypoglycemics (glimepiride 2 mg + pioglitazone 15 mg + metformin 500 mg once daily), gabapentin 300 mg once daily, tolperisone 150 mg + paracetamol 325 mg once daily.

On examination,

- GCS - 15/15
- BP - 160/100 mm Hg
- HR - 88 b/min
- SpO2 (room air) - 96%
- Chest - bilateral vesicular breath sounds, no adventitious sounds
- CVS - S1/S2 audible, no murmurs
- Motor examination - power 4/5 in bilateral knee extensors and ankle dorsiflexors, rest all 5/5
- Muscle tone - normal
- Sensory examination - intact (touch, pain, temperature, proprioception, joint position, vibration)

Investigations:

- Hb - 14.9 gm/dL
- TLC - 7100/cu.mm.
- Platelet count- 3 lakh/ cu.mm.
- FBS/PPBS - 105 mg/dL, 134 mg/dL
- LFT - within normal limits
- Serum sodium - 135 mEq/L
- Serum potassium- 4 mEq/L
- Urea - 34 mg/dL
- Creatinine - 1.21 mg/dL
- ECG - normal sinus rhythm
- Echocardiography- EF 63%, concentric LVH, rest within normal limits

After attaching standard ASA monitors, the patient was induced with 100 mcg i.v. fentanyl, 130 mg i.v. propofol, 35 mg i.v. atracurium and intubated. Then the patient was turned into prone position for surgery.

BP - 135/84 mm Hg, HR - 82 b/min, SpO2 - 98%

At the L4 vertebral level, 20 mL of 0.25% bupivacaine was administered bilaterally at the retrolaminar plane under ultrasound guidance.

BP - 105/68 mm Hg, HR - 76 b/min, SpO2 - 98%

There was significant hypotension subsequently with mean BP as low as 43 mm Hg. Administration of i.v. fluids and vasopressors did not raise the BP consistently. TOF increased to 0.7 twice and 5 mg atracurium was given twice intraoperatively. One gram paracetamol was given towards the end of the surgery. The surgery lasted for 2 hours and the patient was extubated uneventfully.

BP - 138/90 mm Hg, HR - 87 b/min, SpO2 - 98% (room air)

But neurological examination was as follows:

Sensory

Table 1 depicts time to recovery of sensation to crude touch, pain and temperature Dorsal column sensation too returned within 3 hours of extubation.

Level of intact sensation bilateral	Time points after extubation (minutes)
T10	0
T12	30
L2	60
L4	90
S1	120
S3	150
Complete perianal	180

Table 1: Time to recovery of sensation.

Motor

- **Attitude:** Lying supine with both lower limbs in extension and external rotation at hip joint and bilateral feet plantar flexed
- **Gait:** Could not be tested as he could not walk immediately after surgery
- **Tone:** Flaccid bilateral lower limbs
- **Bulk:** Same as pre-operative
- **Power:** Table 2 depicts muscle power (MRC grading) at various time points after extubation.

Reflex

Superficial: Bilateral

- Abdominal - absent in all quadrants (immediately after extubation) - present in all quadrants (2 hours after extubation)

Muscle groups	0 hour	1 hour	2 hours	3 hours	4 hours	5 hours	6 hours	7 hours
Hip flexors	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Hip extensors	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Hip abductors	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Hip adductors	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Hip external rotators	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Hip internal rotators	0/5	1/5	2/5	3/5	4/5	5/5	5/5	5/5
Knee flexors	0/5	0/5	1/5	2/5	3/5	4/5	5/5	5/5
Knee extensors	0/5	0/5	1/5	2/5	3/5	4/5	4/5	4/5
Ankle plantar flexors	0/5	0/5	0/5	1/5	2/5	3/5	4/5	5/5
Ankle dorsiflexors	0/5	0/5	0/5	1/5	2/5	3/5	4/5	4/5
Ankle invertors	0/5	0/5	0/5	1/5	2/5	3/5	4/5	5/5
Ankle evertors	0/5	0/5	0/5	1/5	2/5	3/5	4/5	5/5
Extensor hallucis longus	0/5	0/5	0/5	1/5	2/5	3/5	4/5	5/5

Table 2: Muscle power (MRC grading) after extubation.

- Bulbocavernous - absent (immediately after extubation) - present (2.5 hours after extubation)
- Cremasteric - absent (immediately after extubation) - present (3 hours after extubation)
- Plantar - mute (immediately after extubation) - flexor (2.5 hours after extubation)

Deep tendon reflexes: Bilateral

- Patellar - 0 (immediately after extubation) - 2+ (2 hours after extubation)
- Ankle - 0 (immediately after extubation) - 2+ (2.5 hours after extubation)

The patient was discharged uneventfully on the third postoperative day. On follow up after 14 days, he had been doing well. Informed consent was taken from the patient regarding publication of this case report.

Discussion

Effective postoperative analgesia for lumbar spine surgery decreases morbidity of patients, provides early ambulation and discharge [5]. RLB is an opioid sparing analgesic technique and thus avoids adverse effects of opioids like respiratory depression, constipation, nausea, vomiting and addiction [5]. Kamel., et al. observed that the intra-operative retrolaminar block as an opioid-free regional anesthesia technique enhanced recovery and reduced pain scores after lumbar spine discectomy under general anesthesia [6]. Only one case has been reported previously where there was unilateral motor weakness and hypoesthesia which recovered completely after 28 hours [7]. Imaging of the lumbar spine was done after surgery to investigate the cause of muscle weakness, sensory impairment and absent reflexes in our case, but it was found to be normal. The most plausible mechanism for the neurodeficit could be an unintentional epidural spread of the local anesthetic or spinal nerve infiltration through the neuraxial space or infiltration into the lumbar plexus. Another possibility might be that about a very few milliliters of drug could have spread intrathecally due to microtear of the dura during surgery. But this is speculative since we do not have any imaging or cerebrospinal fluid evidence. The anatomic approach of the RLB was nearer to the neural foramina than the other paraspinal blocks. So, the spread of the local anesthetic was much more to the neural foramina than intercostal space [7]. In a cadaveric study, the spread of local anesthetic given via the superior costotransverse ligament was observed [8]. Observation of at least 5 levels of spread of the given solution (20 ml) in the anatomical cadaver study [9] made the researchers think that the analgesic efficacy will be at the entire lumbar level (L1-5) in the block procedure they performed at the level of lumbar 3 vertebra.

In previous literature, there has been evidence of unintentional motor weakness and joint reflex disorders when continuous erector spinae plane block was given [10,11]. The authors concluded without excluding a possible epidural extension, the weakness of reflexes was due to lumbosacral extension of the local anesthetic.

Motor weakness and absent sensation after lumbar spinal surgery due to RLB is discomforting for the patient. This can be avoided by proper skilled training of the anesthesiologist, use of ultrasound, proper knowledge of the spinal anatomy, appropriate clinical examination, imaging and follow up.

Key learning point

In spine surgeries following retrolaminar plane block (landmark guided or ultrasound guided), an appropriate and structured postoperative neurological monitoring is very essential to rule out any neurological complication. When unexpected deficits occur, reassuring the patient and appropriate imaging help the clinician in managing the complications.

Conclusion

Though retrolaminar plane block is an excellent mode of analgesia in spine instrumentation surgeries, it doesn't come without even rare side effects. In this case, there was transient neurodeficit. Proper knowledge of the spinal anatomy, skill, and training of the anesthesiologist, expertise with the use of ultrasound, clinical examination, reassurance, imaging and follow up may help in preventing such complications.

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Conflict of Interest

The authors have no conflict of interest to declare.

Bibliography

1. Pawa A., *et al*. "Paravertebral blocks: anatomical, practical, and future concepts". *Current Anesthesiology Report* 9 (2019): 263-270.

2. Yang HM., *et al*. "Comparison of injectate spread and nerve involvement between retrolaminar and erector spinae plane blocks in the thoracic region: a cadaveric study". *Anaesthesia* 73.10 (2018): 1244-1250.

3. Voscopoulos C., *et al*. "The ultrasound-guided retrolaminar block". *Canadian Journal of Anaesthesia* 60 (2013): 888-895.

4. Murouchi T and Yamakage M. "Retrolaminar block: analgesic efficacy and safety evaluation". *Journal of Anaesthesia* 30.6 (2016): 1003-1007.

5. Kaushal A and Haldar R. "Regional anesthesia in neuroanesthesia practice". *Discoveries (Craiova)* 8.2 (2020): e111.

6. AA Kamel., *et al*. "Retrolaminar block for opioid-free anaesthesia and enhanced recovery after posterior lumbar discectomy: A randomised controlled study". *Indian Journal of Anaesthesia* 68.3 (2024): 261-266.

7. Peker K. "Unexpected motor weakness after ultrasound-guided retrolaminar block: a case report". *Journal of Comprehensive Surgery* 3.2 (2025): 40-41.

8. Costache I., *et al*. "Does paravertebral block require access to the paravertebral space?" *Anaesthesia* 71 (2016): 858-859.

9. Adhikary SD., *et al*. "Erector spinae plane block versus retrolaminar block: a magnetic resonance imaging and anatomical study". *Regional Anesthesia and Pain Medicine* 43 (2018): 756-762.

10. Selvi O and Tulgar S. "Ultrasound guided erector spinae plane block as a cause of unintended motor block". *Revista Española de Anestesiología y Reanimación* 65.10 (2018): 589-592.

11. Diwan S and Nair A. "Lumbar erector spinae plane block obtunding knee and ankle reflexes". *Saudi Journal of Anaesthesia* 15.2 (2021): 222-224.