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Novel Use of Combined Spinal Anesthesia and Erector Spinae Plane Block for Long Segment Thoracolumbar Fusion: A First in Malaysia

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Background/Clinical Role

1.Spinal Anesthesia (SA) in Spine Surgery:

1. Level-dependent blockade (T4–S5).
2. RCT evidence:

- Avoid airway manipulation, perioperative cardiac ischemia event, Reduce intraoperative blood loss (↓20%), opioid use, and hospital stay vs. GA **(Lee et al., 2021).**
- **Limitation:** Duration capped at 4–6 hours (bupivacaine + epinephrine).

2.Erector Spinae Plane Block (ESPB):

1. Ultrasound-guided fascial plane block, introduced since 2016.
2. Mechanism: Local anesthetic diffusion to dorsal rami → paraspinal analgesia (T1–L4).

- **Evidence Gap:** No consensus on intraoperative efficacy and safety**(Qiu et al., 2020)**

Case Presentation

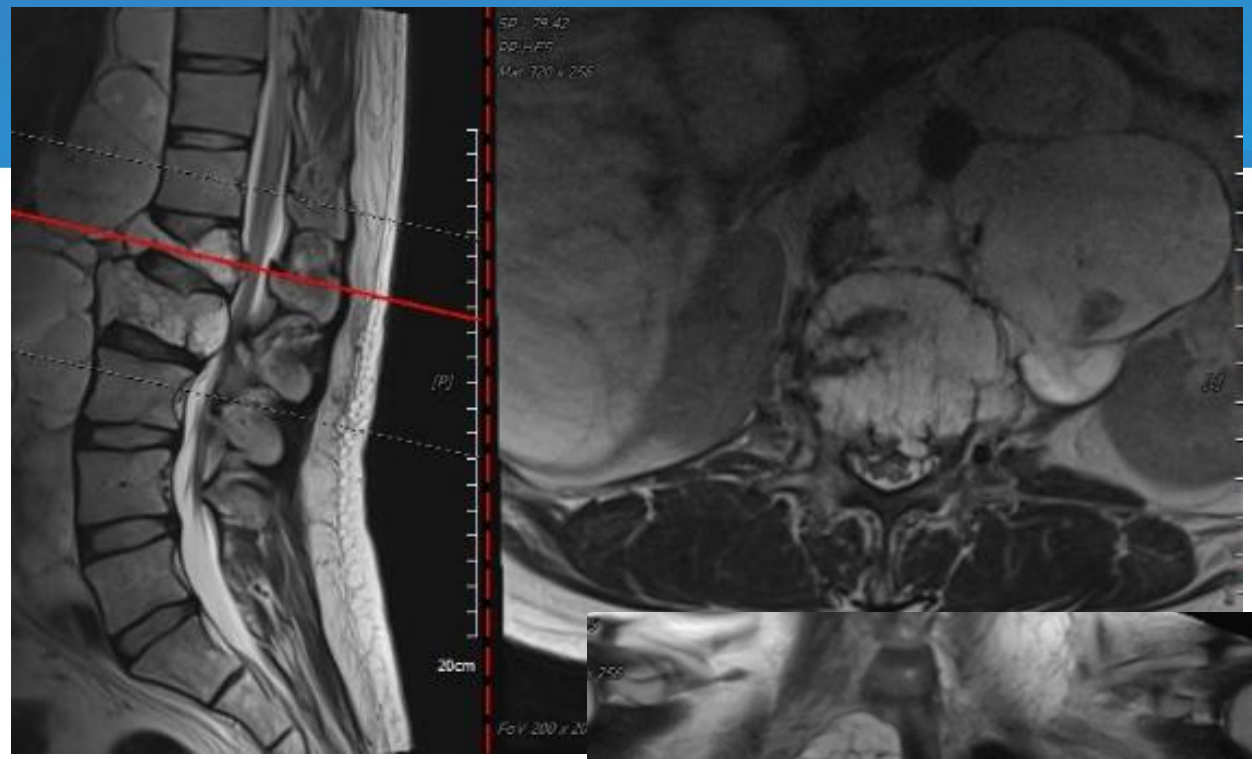
Patient Profile:

- 24-year-old gentleman, stage IV Testicular Cancer with L1 and L2 spine metastases → pathological fracture, spinal canal stenosis (MRI-proven conus medullaris compression).

- **Contraindication to GA:** Tracheal deviation (carinal compression → 4.75 mm lumen).

Surgical Plan:

- **Procedure:** T10–L5 PSIF + L1/L2 laminectomy (palliative stabilization).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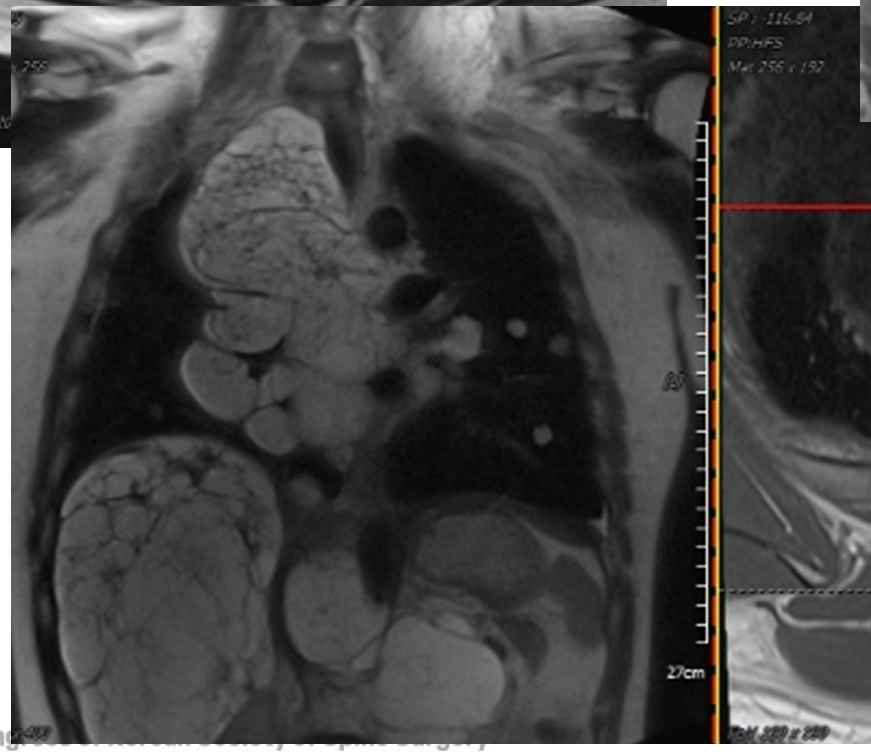
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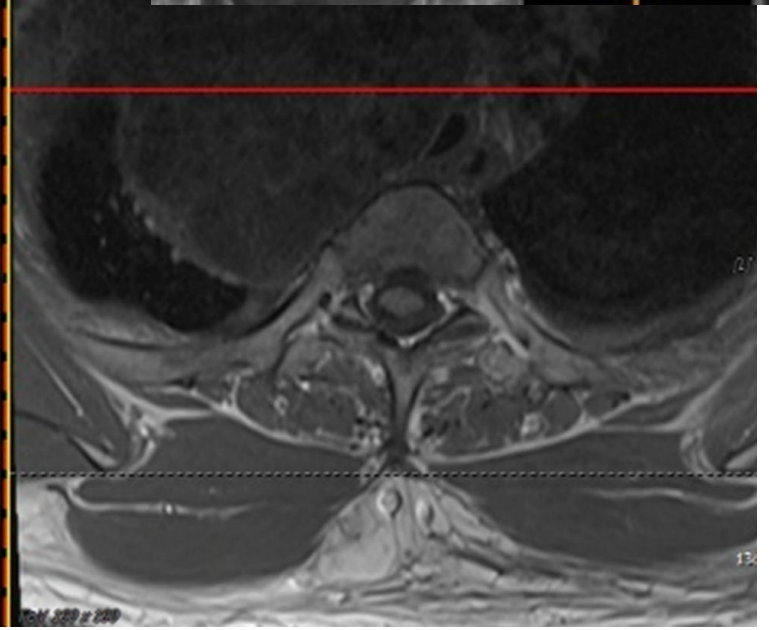
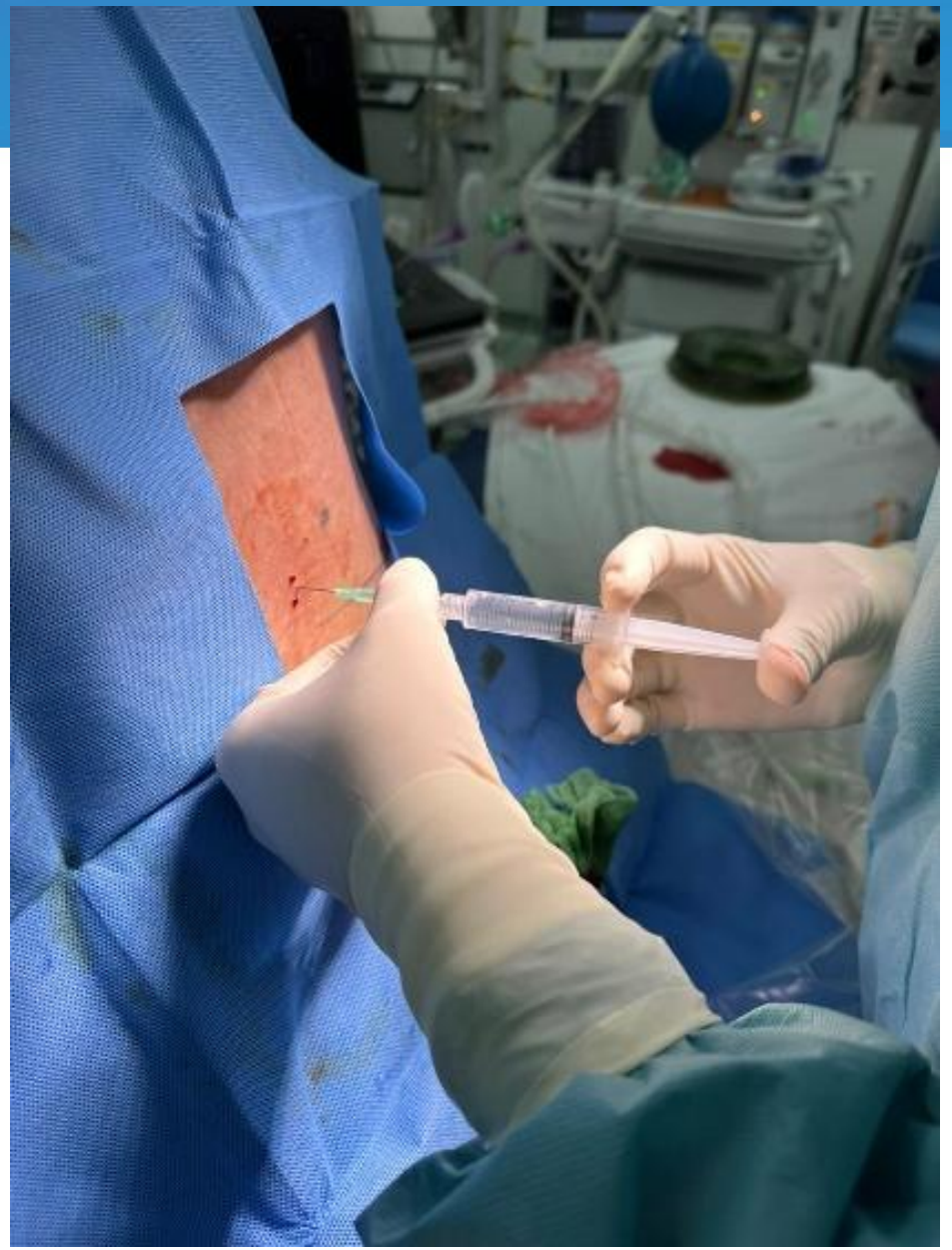


Anesthetic Protocol:

- **SA:** USG guided at L1 level (4cc hyperbaric 0.5%bupivacaine+ 20mcg fentanyl)
- **ESPB:** USG guided at T12, bilateral side (20cc ropivacaine 0.3%+ dexamethasone 4mg each side)

- Placed supine, level of blockade T6-L5 checked.
- Intraoperative: (IV Midazolam 2mg, IV Paracetamol 1g, IV Parecoxib 40mg and TCI Remifentanyl)
- Surgery time 3.5 hours, full operative time 4 hours (Anaesthesia to ICU).



Post operative Outcome

- PCA Oxynorm started 8 hours later, changed to oral analgesia after 2 days.
- Discharged at **day 3 post op**.
- **NO pain** upon follow up at 2 week post op.
- Significant clinical improvement, with resolution of spinal instability and radiculopathy.

Discussion

- Spinal anesthesia (SA) is a safe, feasible, and cost-effective alternative to general anesthesia (GA) for lumbar spine surgery. **(Perez-Roman RJ et al., 2021)**
- Similar utility and low complication rates of SA in complex lumbar spine surgery when compared with simple decompressive lumbar surgeries with SA. **(Breton JM et al., 2022)**
- Surgeons remain cautious about adopting SA for spine surgery due to multiple practical and perceived challenges. (**Smith JS et al., 2024)**
  - ➢Patient movement compromising surgical precision
  - ➢Incomplete analgesia risking urgent conversion to GA.
  - ➢Intraoperative durotomy compromises the efficacy of SA or if SA increases the incidence of durotomy. **(Breton JM et al., 2022)**
  - ➢SA limited the use of intraoperative neurophysiological monitoring (IONM). **(Kanter M et al,. 2023)**

Discussion

- Existing literature primarily focuses on ESPB's role in postoperative pain management, current evidence does not support its use as a standalone anesthetic technique for spine surgery. **(Breebaart MB et al. 2019)**
- The erector spinae plane block (ESPB) provides effective postoperative analgesia for lumbar spine surgery, reducing opioid consumption by up to 50% compared to controls, as demonstrated in a 2023 randomized controlled trial. (**Ueshima et al. 2023)**

Conclusion

This case highlights the successful use of combined spinal anesthesia (SA) and erector spinae plane block (ESPB) in a high-risk patient undergoing long-segment lumbar fusion and decompression for metastatic spinal cord compression.

In carefully selected patients, combined SA and ESPB offers a viable anesthetic strategy for complex spine surgery when GA is contraindicated.

Further studies are warranted to validate its efficacy, refine technical protocols, and expand its adoption in spine surgical practice.