

Foot Drop after Combined Spinal Epidural: A Rare Neurological Complication

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ABSTRACT

Neurological deficit post central neuraxial blockade is rare but considered for highest compensation. We present a case of S1 mononeuropathy presented as foot drop after combined spinal epidural. A 30-years-old male with lower limb fracture was posted for plating. Patient was ASA grade I and all his investigations were normal. Combined spinal epidural was planned. The procedure was performed following all standard operating procedures. Surgical procedure was uneventful, epidural catheter was removed 12 hours postoperatively. 24 hours postoperatively foot drop was noted. Patient was evaluated by neurologist. Ankle dorsiflexion power-1/5, extensor hallucis longus and extensor digitorum brevis were weak. MRI spine was done, which was normal. Neurologic impairment after subarachnoid block is rare, but multifactorial. The causes can be divided into iatrogenic or idiopathic. In some cases it could be a coincident to clinical presentation of any other organic disease. Trauma by the needle or catheter are the commonest causes for the neurological deficit. Regular follow-up and supportive treatment is important in these patients. Medicolegal issues is a big worry in such cases.

Keywords: Central neuraxial blockade, Foot drop, Mononeuropathy, Neurological deficit.

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INTRODUCTION

The central neuraxial blockade is a popular technique for orthopedic surgeries in many centers. The complication and neuro deficit noted are very rare. Neurological deficit after central neuraxial blockade is of the highest severity, and these injuries are entitled to higher compensation. Increased vigilance on the part of the attending anesthesiologist, with prompt diagnosis and appropriate intervention, may improve outcomes in high severity injuries.¹ We present a case of transient motor mononeuropathy of the S1 nerve root presented as foot drop after the combined spinal-epidural (CSE).

CASE DESCRIPTION

A 30-year-old male admitted with a history of a road traffic accident with a compound right lower end tibia fracture, posted for open reduction, and internal fixation. American Society of Anesthesiologists (ASA) status 1. No history suggestive of head injury. Systemic examination was normal. No scars, sinuses, or any skin lesions on the back. No tenderness was noted at the lumbar spine, and spaces were normal. All routine investigations were normal. Hb—10.8 g/dL, TLC—8,700, platelet—2 lac. S Cr—0.9 mg/dL, INR—1.23, and PT—15.6 against control of 15 seconds. X-ray chest—normally combined spinal-epidural was planned. Written informed consent was taken. The standard technique for a combined spinal-epidural was followed. Epidural space was located in L3–L4 interspace in sitting position and midline approach in the first attempt, with loss of resistance to air technique. Spinal needle was passed through Tuohy's needle, with a clear flow of CSF and no resistance 3 mL of Inj. 0.5% heavy bupivacaine was injected. There was no pain on injection. The epidural catheter was 4 cm within the epidural space. The sensory level was T8, and the motor was T10. Catheter was fixed, and patient was given a supine position. The procedure was completed in 2 hours, uneventfully with 200 mL blood loss. Patient was observed in recovery for 2 hours, the sensory and motor level receded to L1. 12 hours after

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the procedure VAS score was 2/10, hence no analgesics were given by the epidural route. Coagulation profile was confirmed to be normal. Epidural catheter was removed, thereafter confirming the blue tip. No discharge or tenderness was noted at the site. Tincture benzoin applied.

After 24 hours, on postoperative rounds foot drop in the left leg (nonoperated leg) was noted. Patient was afebrile, with no signs of infection at the site of epidural insertion and no signs of meningitis. Neurological opinion was taken. Left lower limb power: hip and knee = 5/5, ankle dorsiflexion = 1/5, and plantar flexion = 5/5. Extensor hallucis longus and extensor digitorum brevis were weak. However, the sensations to pin prick and touch were normal. The findings in both the upper limb and right lower limb were normal. Bowel and bladder were unaffected. Due to cast in the right lower limb, ankle movements in right lower limb could not be elicited in full range, but toe movements were normal. Acute radiculopathy was a provisional diagnosis. MRI spine showed—cord ends at L1 level, no evidence of cord tethering. No abnormal postcontrast enhancement or abnormal pre and paravertebral soft tissue mass. No spinal and epidural hematoma. Injection dexamethasone 4 mg 3 times/day, inj. vitamin B₁₂ and physiotherapy was started as per

neurologist advice. Vitamin B₁₂ and vitamin D levels were normal. On 2nd day, there was an improvement in the tone of left ankle dorsiflexion and power was 2/5. On day 14th, complete recovery of the left limb was noted. The cause of delayed recovery of S1 motor nerve was a question in this case.

DISCUSSION

Neurologic impairment after subarachnoid block is rare but multifactorial. Mononeuropathy was the probable cause of foot drop in our patient. There are several case reports with transient and permanent neuro deficits. The causes can be divided into—iatrogenic or idiopathic. In some cases, it could be just a coincident to the clinical presentation of any other organic disease. The most common reason for neuro deficit postneuraxial blockade is by direct trauma or compression to nerve or spinal root. Cord ischemia due to trauma, anterior spinal artery syndrome is known. Some pathology may mimic neuro deficit caused by needle injury while performing central neuraxial blockade. A spinal meningioma, AV malformation, spontaneous hematomas, multiple sclerosis, tumors metastasis may present similarly.

The operating anesthesiologist, while performing the procedure can cause direct trauma to the cord or to the nerve root as it leaves the canal with the needle or while passing the catheter. The later is more common to present a single affected nerve root in a paramedian approach. In our case, the approach was median; however, it can be misjudged by an operator. Palpation may not be a reliable technique, with an error of one-third to identify the interspinous level in obstetric patients.² It seems to be safer for anesthesiologists to aim at L3–L4 interspinous level or lower in the intrathecal technique. The intervertebral needle insertion site that is usually targeted is the L3–L4 interspace, or less commonly, the L2–L3 interspace.³ In some individuals the spinal cord may end beyond the L1 vertebrae but with no neurological symptoms. The standard technique can cause a nerve injury in such patients. The conus medullaris terminale ends at L1, but anatomical variation are common and aging affects its level as well.⁴ Soleiman et al. postulated that older people in general have a lower conus medullaris terminal (CMT) than younger people.⁵ Ahmed et al. reported a similar case foot drop after spinal anesthesia in low lying cord in a pregnant patient after spinal anesthesia, where MRI revealed—intramedullary T2 hyperintensity suggestive of needle injury.⁶

Spinal hematoma and AV malformation are rare. Spinal hematomas are common with patients with blood coagulation disorders. Jeon et al. reported, when spinal or epidural anesthesia is administered, the possibility of hematoma occurrence should always be considered regardless of the use of anticoagulants or multiple or traumatic centesis trials.⁷ Spinal and epidural hematoma are diagnosed on MRI treated by surgical excision. Bleeding in subdural space can puncture radiculomedullary vessels found along with the nerve roots, which may be punctured, especially if the puncture is off the midline.⁸

Spinal meningioma present in elderly patients, while in young patients, they are associated with neurofibromatosis. The symptoms

are spinal cord or nerve compression, depending on the location. The patients present late when they have a neuro deficit.

We ruled out vitamin B₁₂ and vitamin D in our patient. Foot drop is a common complication with common peroneal nerve and sciatic nerve compression in the lithotomy position, prolonged surgery causing compression by a bolster or abnormal pressure. In our case, it was only a 2 hours procedure in supine position, so the possibility of abnormal positioning is rare. Ischemia to the spinal segment may present similarly. The vital parameters were well maintained throughout the procedure, chances of ischemia to spinal cord segment is least expected in our case, presenting only as a motor deficit. A similar case was noted in by Vipin et al. foot drop after spinal anesthesia, with no definitive cause was found, and the patient improved gradually over a month.⁹ In our case, patient improved over 14 days. The reason of foot drop in our case is a query. Regular follow-up of the patient, counseling, and supportive therapy is essential.

CONCLUSION

Unexpected complications like delayed neuraxial recovery can be the presentation in some cases of central neuraxial blockade. Regular follow-up and supportive treatment are important in these patients. Medicolegal issue is a big worry in such cases.

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