Case Report

Dural ectasia

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ABSTRACT

Dural ectasia is one of the likely causes of incomplete or failed spinal anaesthesia. Its association with diseases like Marfans syndrome, neurofibromatosis, osteogenesis imperfecta, vertebral fracture, postopertative adhesions, trauma etc., is often overlooked as a reason for inadequate spinal anaesthesia. Greater than normal volume of cerebrospinal fluid in the lumber theca in dural ectasia is postulated to restrict the spread of intrathecally injected Local anaesthetic. Here, we report a case of failed spinal anaesthesia but successful epidural anaesthesia in later setting in a patient with dural ectasia.

Key words: Causes of spinal anaesthesia failure, dural ectasia, failed spinal anaesthesia

INTRODUCTION

Failed spinal anaesthesia is not an uncommon occurrence and may be broadly attributed to factors like:

- Faulty clinical technique and a non-meticulous approach leading to solution injection error
- Drug characteristics: Low total dose, baricity and relative position of the patient, potency or quality of the drug
- Patient factors causing improper spread of the intrathecally placed drug-kyphosis/scoliosis, spinal stenosis, post spinal-surgical adhesions, intrathecal septae, high CSF volume, dural ectasia, etc.

Here, we report a case of 30-year-old male patient who had failed spinal anaesthesia on two successive attempts but had an adequate response to subsequent epidural anaesthesia.

CASE REPORT

A 30-year-old chronic alcoholic male of average height, weight and built was admitted in an emergency with closed fracture of left patella following trauma. Patient was normotensive, non-diabetic with normal systemic examination and routine blood investigations. The patient was fasted for 8 h and prepared for spinal anaesthesia. An intravenous (IV) line with lactated ringer solution (RL) was started and monitors for pulse rate (PR), SpO_2, non-invasive blood pressure (NIBP), continuous electrocardiogram were attached. Lumbar puncture was performed in sitting position at L_4-L_5 interspinal space in midline with 25 gauge Quincke spinal needle under complete aseptic precautions. After obtaining the free flow of cerebrospinal fluid (CSF), 2.6 ml of 0.5% Hyperbaric Bupivacaine was injected intrathecally and the puncture site was sealed with sterilized dressing. A 10° head-low tilt was given to the table. Fine touch, pin prick, cold and hot sensations and superficial reflexes were tested to see the onset of sensory and motor block at every 5 min interval. However, there was no sensory or motor block even after 30 min of injection. There was no change in PR and NIBP. Considering it to be a failed spinal, a repeat lumbar puncture was performed by a more experienced anaesthesiologist in L_3-L_4 interspinal space in sitting position with fresh 25 gauge Quincke Spinal needle and 1.4 ml of hyperbaric Lignocaine 5% was injected after the free flow of the CSF. Immediately, the patient was made supine with 15° head low tilt. Still, there was no sensory/motor block in any dermatome after 30 min with stable vitals. The surgery was postponed on the day as patient became uncooperative and complained

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of mild head-ache. He was observed for 48 h with oral and IV fluids along with tablet ipobrufen SOS. Headache was completely relieved in 24 h.

On the 3rd day, the patient was counselled and prepared for epidural anaesthesia. An informed consent was taken. In the OR, essential monitors were attached. 18 gauge IV line with RL was established and injection 1 mg midazolam IV was administered. With the patient in sitting position, an 18 gauge Touhy needle was inserted at the midline of L_3-L_4 interspace under sterile condition after infiltration of 1% Lignocaine at the site of puncture. Epidural space was identified at a depth of 4.5 cm using loss of resistance technique and a 19 gauge epidural catheter was threaded and fixed at 9 cm. After confirming a negative test dose, 10 ml of 2% lignocaine with epinephrine 1:200,000 and fentanyl 50 μg was slowly injected. The sensory block was at T10 spinal segment after 15 min of last epidural injection. The surgery was started. The haemodynamic parameter remained stable throughout the surgical procedure and immediate postoperative period without any requirement of vasopressor or inotrope. The post-operative pain was managed with 8th hourly dose of epidural Bupivacaine 0.125% (6 ml). The epidural catheter was removed after 48 h of surgery. Post-operative period remained uneventful.

Since the cause of failed spinal could not be explained, the patient was subjected for contrast magnetic resonance imaging (MRI) - lumbosacral region after 3 weeks of surgery during follow-up visit. The contrast MRI revealed an increase in anteroposterior (AP) diameter of the dural sac in the lumbar region – a sign of dural ectasia [Figure 1].

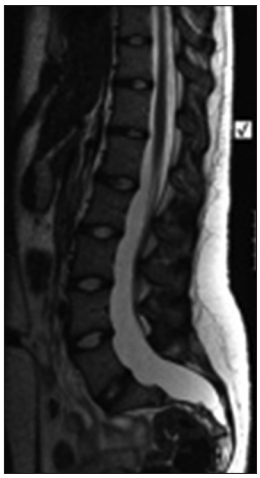

Figure 1: Contrast magnetic resonance imaging showing the increase in anteroposterio diameter of the dural sac

DISCUSSION

Dural ectasia-refers to ballooning or widening of the dural sac and is associated with herniation of nerve root sleeves. Greater than normal volume of CSF in the lumbar theca is postulated to restrict the spread of the intrathecally injected LA and is thought to be one of the main reason for spinal anaesthesia failure.[1] A negative correlation has been found between lumbar CSF volume and peak sensory level achieved with intrathecal hyperbaric bupivacaine.[2] Presence of dural ectasia is not always symptomatic; although, it sometimes causes low back pain or radicular pain in the buttocks or legs and headache in some affected persons. Pain may be accompanied by leg weakness or urinary incontinence. Other associations include Marfans syndrome, spondylolisthesis, scoliosis, vertebral erosions and vertebral fractures, ankylosing spondylitis, osteogenesis imperfecta, trauma, post-spinal surgery, tumours, etc.

In our case, we practised a meticulous approach while performing the lumbar punctures and changed the performing Anaesthesiologist and type of drug for repeat puncture. This significantly ruled out the technique or drug related cause of the spinal failure. Since, there was no overt patient characteristic, the cause of failed spinal could not be explained. Therefore, a contrast MRI was advised, which revealed an increase in AP diameter of the dural sac in lumbar region-a definite sign of dural ectasia.[3]

On further interrogating the patient in follow-up, the patient accepted that he rarely has feeling of urgency of micturition with tingling and numbness in legs on prolonged standing, which gets relieved after lying down. There were no evident features of any other above mentioned association except recent trauma. Hence, a detailed pre-operative evaluation is must.

Other radiological findings[4,5] include posterior vertebral scalloping on X-ray. However, it is not specific for dural ectasia. Lacassie *et al*. reported two cases of inadequate spinal anaesthesia in two parturient with the Marfans syndrome and suggested that dural ectasia and the associated increase in CSF volume were possible causes of erratic spread of spinal anaesthesia.[6] As there is dilation of the dural sac in dural ectasia, dural puncture may result in excessive leakage of CSF leading to increased chances of post-dural puncture head-ache (PDPH).[7] We observed

an early onset of head-ache after two successful dural punctures, which was relieved within 24 h. Also, dural ectasia is a relative contraindication of epidural anaesthesia because of the fear of puncturing of dilated dural sac.[8,9]

CONCLUSION

The possibility of incomplete/failed spinal anaesthesia are always there in patients with certain overt/covert disorders, therefore a detailed pre-operative evaluation and X-ray lumbosacral spine in certain patients is indicated before selecting the anaesthetic technique. After dural puncture, the patient with dural ectasia must be observed in the post-operative period for signs of PDPH. Epidural anaesthesia is not an absolute contraindication in dural ectasia, provided meticulous care is taken while detecting the epidural space, which is possible with the use of recent available equipment.

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