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Anesthesia: Essays and Researches

Case Report

Lumbar laminectomy with segmental continuous epidural anesthesia

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Abstract

Lumbar laminectomies are usually performed under general anesthesia in the prone position. We report a case of lumbar laminectomy done under segmental continuous epidural anesthesia, so that direct visual intra-operative monitoring of the motor and sensory component of the lower extremities was possible.

Key words: Laminectomy, prone position, regional anesthesia, segmental thoracic epidural

INTRODUCTION

Administration of general (GA), regional or combined anesthetic techniques have been described for performing lumbar laminectomies. Though general anesthesia has the advantages of carrying out prolonged surgeries in the prone position without airway compromise,[1] its disadvantages such as increased blood loss, increased mean arterial pressure and heart rate along with higher incidences of post-operative arterial and venous emboli exist. To add, decreased incidence of nausea and vomiting favored the use of regional anesthesia in such cases.[2]

Regional anesthetic techniques such as spinal, continuous epidural and combined spinal epidural can provide stable hemodynamics, minimizing intra-operative bleeding resulting in a better surgical field.[3,4] Regional anesthesia also provides better muscle relaxation with early post-operative analgesia.[5] The prolonged use of prone position and access to airway favored the use of combining GA along with regional techniques.

In this case, we opted for segmental continuous epidural anesthesia as we want to monitor the sensory and motor component of lower extremity throughout the surgery.

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CASE REPORT

The present case is about a 35-year-old female patient American Society of Anesthesiologists one patient weighing 75 kg came with prolapsed L4 disc reported to us with minimal sensory and motor weakness of great toe, was posted for elective L4 laminectomy and pedicular screw fixation. After getting an informed written consent from the patient, she was shifted into operation theater and standard anesthetic monitoring was instituted which included non-invasive blood pressure, oxygen saturation (SpO_2) and electrocardiogram. The plan was to administer segmental continuous epidural anesthesia to favor the surgeon to monitor the sensory and motor deficits intra-operatively.

After securing intravenous (IV) access in the right forearm with 18G Venflon, Ringer's lactate solution was started and the patient was pre-medicated with IV 2 mg midazolam and 15 μg of clonidine. She was positioned in the lateral

decubitus position and an epidural catheter via 18G Tuohy needle was placed in T9-T10 interspace [Figure 1] using loss of resistance technique and fixed 2.5 cm inside and 10 ml of 0.5% bupivacaine was given to achieve adequate segmental blockade between T6-L2 dermatomes without any blockade of lower dermatomes. ProSeal laryngeal masks of 3 and 4 sizes were kept as a standby in case of failed epidural, patient discomfort or in case of any emergency. After Foley's catheterization surgery was started. At 2 h after the start of the surgery epidural top up with 8 ml of 0.5% bupivacaine was given. The duration of surgery was 3.5 h. Throughout the surgery the patient was hemodynamically stable and blood loss was minimal (200 ml). Post-operative analgesia was maintained with shots of 8 ml of 0.125% bupivacaine. The post-operative course was uneventful.

DISCUSSION

Lumbar laminectomies have been successfully performed under general anesthesia, combined general and epidural anesthesia, combined spinal and epidural anesthesia and continuous epidural anesthesia. However, there are only limited studies which have shown use of segmental continuous epidural anesthesia for lumbar laminectomies.

In a study by Attari *et al*.[3] have compared spinal and general anesthesia for spinal surgeries in 72 patients and found that there was no significant difference in the duration of surgery and post-anesthesia care unit in both the groups, but the intra-operative mean arterial pressure changes and heart rate changes were significantly less in spinal anesthesia group. Surgeon satisfaction was significantly more in spinal anesthesia group. Blood loss was significantly less in spinal anesthesia group. In our patient, we purposely avoided spinal anesthesia as it will cause complete block of the extremities.

In another study, Khajavi *et al*.[4] have compared general anesthesia with combined epidural and general anesthesia in terms of intra-operative and post-operative parameters in patient posted for lumbar disc surgery and found that significantly higher intra-operative blood pressure and heart rate with more frequent post-operative tachycardia, hypertension, nausea, vomiting were in general anesthesia group but the mean intra-operative blood loss was significantly lower in the combined group. In our patient, the intra-operative hemodynamics was stable and ours is a single case report to comment further. Yoshimoto *et al*.[5] studied the use of peri-operative epidural anesthesia with morphine and IV propofol in comparison with general anesthesia with sevoflurane and fentanyl in 40 patients posted for posterior lumbar spinal fusion and found that peri-operative epidural anesthesia provide more stable hypotension during surgery and also the post-operative pain was better controlled with epidural anesthesia. Greenbarg *et al*.[6] conducted a retrospective review in 80 patients who underwent lumbar spine surgery, 40 of which received epidural anesthesia and other 40 received general anesthesia and concluded that in the epidural group the incidence of operative blood loss, narcotic usage and post-operative pain was less. In our case, there was stable hemodynamics with less blood loss along with monitoring of the movements of the great toe and ankle, which otherwise wouldn't be possible with general anesthesia. Düger *et al*.[7] compared spinal, continuous epidural and combined spinal epidural anesthesia with the addition of morphine for lumbar laminectomy in terms of anesthesia, intra- and post-operative analgesia and side-effects and found that all three groups were similar in surgery time, peak sensory levels, heart rate, mean arterial pressure, peripheral SpO_2 and intra-operative Ramsey sedation score. Post-operative pain score were higher in spinal anesthesia group along with a higher incidence of nausea and vomiting attributed to more morphine consumption for post-operative pain. Hence in our case we preferred only epidural anesthesia, as in spinal anesthesia the motor blockade below the level is complete which precludes monitoring of the movements of great toe and ankle. We used IV clonidine to enhance sedation and improve patient compliance during conscious prone position. In a study of 33 laminectomies (29 lumbar, 2 thoracic, 2 cervical) Lucca Escobar and Castillo[8] used epidural anesthesia two spaces above for lumbar spine surgeries and two spaces below for thoracic and cervical cases successfully and in that study there is no mention about intra-operative neurological monitoring. In cases of breakthrough pain, they have used metycaine spray of the dura. Such a necessity did not arise in our case.

Figure 1: Both the incision and the thoracic epidural sites

CONCLUSION

We conclude that continuous segmental epidural anesthesia is feasible in lumbar laminectomy. It seems to be advantageous in maintaining better hemodynamics along with intra-operative neurological monitoring of lower limbs

over other established techniques. The limitation includes this being a single case study; a controlled comparison with other techniques was not possible.

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