

# Thoracic Epidural Anesthesia For Lumbar Spine Decompressive Surgery In An Elderly Patient

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## Abstract

We present a case of an elderly patient with a significant medical history, who underwent elective lumbar decompressive surgery, three months after sustaining a myocardial infarction. After a collaborative pre-surgical assessment by the neurosurgery and anesthesiology teams, epidural anesthesia was performed. A thoracic epidural catheter was inserted pre-operatively. The patient underwent successful L4-5 synovial cyst removal, and subsequent relief of pain. Epidural anesthesia is a viable alternative to general anesthesia for lumbar surgery, is safe and may offer several benefits, particularly in patients with multiple comorbidities.

## INTRODUCTION

Despite reports of neuraxial anesthesia as a safe and effective alternative, general anesthesia remains the most commonly used anesthetic technique for lumbar spine surgery.<sup>1</sup> However, epidural anesthesia may offer significant advantages when compared to general anesthesia. Patients with significant medical problems may benefit from the positive effects of neuraxial anesthesia on the cardiovascular, pulmonary and neurologic systems. Reduction of blood loss and improved surgical conditions, avoidance of nerve injury (due to patient self positioning), verbal communication between surgeon and patient, reduction of postoperative mortality, improved analgesia, decreased side effects from analgesics and more stable intraoperative and postoperative hemodynamics are cited as potential key advantages.<sup>1,2</sup> Thoracic epidural anesthesia may improve coronary perfusion, myocardial oxygen balance and may reduce cardiac events.<sup>3</sup> In this case report, we demonstrate the successful application of epidural anesthesia for lumbar spine decompressive surgery in a patient with severe three vessel coronary artery disease.

We received written permission from the patient to publish this case report.

## CASE

A 91-year-old ASA 3, 69 inch, 75 kg male presented for lumbar decompressive surgery due to severe spinal stenosis causing debilitating back and leg pain. His past medical history was significant for an inferior ST elevation myocardial

infarction three months prior to the surgery, three vessel coronary artery disease, hypertension, noninsulin dependent diabetes mellitus, peripheral arterial disease, hyperlipidemia, stroke, paroxysmal atrial fibrillation, bladder cancer, prostate cancer, microcytic anemia and benign prostatic hypertrophy. At the time of the myocardial infarction, the patient underwent coronary catheterization and medical therapy to include aspirin therapy and beta blockade, were recommended. The patient was then seen in the neurosurgery clinic for sciatica, a few weeks later. An MRI revealed a synovial cyst at the L4-L5 lumbar region. After consultation with neurosurgery a day earlier, we placed a thoracic epidural catheter pre-operatively on the day of surgery. The catheter was uneventfully placed at the T10-T11 interspace using an 18 gauge 3.5" Tuohy needle. In the operating room, the patient was placed in the left lateral decubitus position and standard ASA monitors were placed. Oxygen was delivered by face mask and ventilation was measured by capnography. An epidural infusion containing 0.125% bupivacaine and fentanyl (5 mcg/ml) was initiated at 10ml per hour, after an initial test dose of 3 of ml 1.5% lidocaine with epinephrine, followed by a bolus of 1% lidocaine 6 ml through the epidural catheter.

A low dose propofol infusion was used for sedation. A sensory level check was performed using the pinprick method, prior to surgical incision. Bradycardia and hypotension were treated with intermittent boluses of ephedrine throughout the case. He was responsive to verbal and physical stimuli and denied pain. After the completion

of the surgical procedure, the patient was taken to the recovery unit and the epidural catheter was removed per surgeons request for physical examinations. The following day, the patient was ambulating, epidural blockade had resolved and his pain was controlled with oral medications. He remained in the hospital for three days after the procedure for urinary retention (for which a foley catheter was placed) and for arrangement of social and rehabilitation services. He was discharged on postoperative day three. At 2 weeks and 6 weeks after the operation, the patient was doing well clinically, he no longer had any lower extremity pain and was pleased with the surgical result.

### **DISCUSSION**

Although epidural anesthesia is utilized to provide surgical anesthesia for different types of procedures, general anesthesia remains the primary anesthetic for lumbar spine surgery<sup>1</sup>. This may be attributable to the relatively small number of subjects in many of the studies examining this application. Another factor may be the position of the patient for the required surgical approach. A number of lumbar cases are performed with the patient in the prone position. This may prompt many clinicians to administer general anesthesia as the primary anesthetic, securing the airway with an endotracheal tube before positioning the patient in the prone position. The concern for airway obstruction and having to emergently reposition the patient supine, to perform an endotracheal intubation, interrupting the surgical procedure, is valid. However, much like spinal cord some lumbar spine cases may be done safely utilizing epidural anesthesia and monitored anesthesia care in a prone patient. Patient selection and careful titration of sedatives, may allay fears of airway loss in the prone position.

To address the concern of positioning, we recommend a preoperative discussion with the surgical team to explore the potential for more favorable positions such as presented in this case. We explained to the surgical team the advantages of changing the surgical approach, from the prone to the lateral position. Firstly, we would be able to quickly place the patient supine and intervene for any potential complications during the case, especially in an elderly patient with comorbidities. Also, we would be able to avoid some of the disadvantages of the prone position on the cardiovascular system.

Finally, proper patient selection is prudent. Similar to procedures such as carotid endarterectomy performed under regional anesthesia, careful screening of surgical patients for medical conditions that would preclude them from having

epidural anesthesia as a primary technique, may be warranted. Such a screening process may identify patients with markers that may deem them inappropriate for lumbar surgery under epidural anesthesia, such as those with anxiety or dementia. During the preoperative interview, the patient appeared to be amenable to our anesthetic approach after reviewing the history, describing the anesthetic plan, the length of the procedure and his concerns about being awake and possibly aware of some parts of the procedure.

A prospective randomized study (60 patients) by Demirel et al.<sup>1</sup> supported the use of an epidural catheter for lumbar disc surgery. In the epidural arm of the study, 2 out of 30 patients did not achieve surgical analgesia and their pain resolved with intravenous fentanyl. There were no major complications in the study and the surgeries were successfully performed.

One of the major concerns in this case was the history of significant coronary artery disease and the recent myocardial infarction, three months earlier. We chose epidural anesthesia because of the previously reported benefits of reduced cardiac complications.<sup>4</sup> We also chose to place the epidural catheter in the thoracic level to ensure that we did not interfere with the surgical field and for the added benefits of a sympathectomy produced from epidurally administered local anesthetic; prevention of increased myocardial oxygen demand as a result of hypertension and tachycardia.<sup>3</sup> Beattie and el.<sup>5</sup> reported a reduction of post operative myocardial infarction with the use of epidural anesthesia. Rodgers et al.<sup>2</sup> found that neuraxial blockade reduced the risk of thromboembolic events, decreased mortality by one third, and decreased the risks of pneumonia and myocardial infarction.

In another study by Khajavi et al.<sup>5</sup> patients who received combined epidural and general anesthesia had superior pain control and had less blood loss compared to the general anesthesia group. We can deduce that adequate and superior pain control with epidural anesthesia may be beneficial by preventing frequent fluctuations in hemodynamics with changes in the levels of

Many lumbar spine cases are performed in the prone position. However, some patients may experience hypotension due to decreased venous return. The lateral position is usually not associated with decreased venous return and would maintain cardiac output and coronary blood. Another advantage of the lateral position is decreased blood loss. The prone position may lead to compression of

the abdomen and hence engorgement of epidural veins, leading to more surgical bleeding as compared to general anesthesia<sup>1</sup>. The sympathectomy produced from epidural anesthesia leads to vasodilation and perhaps hypotension which result in decreased blood loss.

We regard to the patient's urinary retention, there are a number of potential causes. He does have a history bladder and prostate cancer as well as benign prostatic hypertrophy. Urinary retention can also be caused by epidural anesthesia. local anesthetics and opioids administered epidurally may both result in urinary retention. However, we removed the epidural catheter immediately upon arrival in the recovery unit per surgeon's request. Therefore, it is unlikely that the epidural solution containing bupivacaine and fentanyl was the cause of urinary retention since both medications are relatively short acting. His urinary retention lasted for a few days as he was discharged with a foley catheter.

### CONCLUSION

Epidural anesthesia may offer several advantages when compared to general anesthesia for lumbar spine surgery. There are a number of benefits which may prove advantageous for patients with multiple comorbidities, for which epidural anesthesia can be applied. More randomized studies may be required to encourage more wide spread use of epidural anesthesia for lumbar spine surgery.

### Figure 1

T2-sagittal lumbar magnetic resonance image showing a synovial cyst at L4-5.



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