

# Fluoroscopy guided transforaminal epidural anesthesia in ankylosing spondylitis

### ABSTRACT

A 48-year-old male patient with a long-standing history of ankylosing spondylitis (AS) presented for ureteroscopic stone removal. On preoperative assessment, tracheal intubation was likely to be difficult due to decreased cervical spine mobility. Traditional neuraxial block was impossible due to the fusion of vertebral bodies. AS patients present the most serious array of intubation, which is secondary to decrease in cervical spine mobility and possible temporomandibular joint disease. Management of a case of AS can be very challenging when the airway and the central neuraxial blockade, both are difficult. Fluoroscopic assisted central neuraxial blockade may lead to predictable success in AS. We present a case report with severe AS where conventional techniques failed and C-arm assisted helped in successful epidural anesthesia for ureteroscopic stone removal.

**Key words:** Ankylosing spondylitis; fluoroscopy; transforaminal epidural anesthesia

### Introduction

Ankylosing spondylitis (AS) is a chronic inflammatory disease of the axial skeleton and peripheral joints.<sup>[1]</sup> Its main characteristic is the fusion of vertebral bones, which leads to loss of flexibility of the back and neck.

Ankylosing spondylitis has always been a challenge to the anesthesiologist due to either a difficult airway or a seemingly impossible central neuraxial blockade. Fiberoptic bronchoscopy has been used successfully to secure the airway,<sup>[2]</sup> as central neuraxial blocks may not be easy to perform in such cases. The use of fluoroscopy and ultrasound guided central and peripheral nerve blocks have helped in achieving predictable success.<sup>[3]</sup>

### Case Report

A 48-year-old male, weighing 64 kg, with 18 years history of AS admitted for right-sided ureteroscopic stone removal.

On preoperative evaluation, patients revealed history of difficult in lying supine position without high pillow due to AS involving the cervical spine. On physical examination, suggested severe AS involving the entire vertebral column. No significant abnormality in respiratory and cardiovascular system.

Airway examination showed restricted neck movement, adequate mouth opening, Mallampati grade II. Radiograph of spine showed a fusion of vertebral bodies and

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calcification and ossification of posterior ligaments and soft tissue.

His baseline pulse rate was 95 beats/min and blood pressure was 140/80 mm of Hg. X-ray of spine showed cervical spondylitis, kyphosis of the thoracolumbar spine, and total ankylosis of spine. His pulmonary function tests showed normal results. Patient's hemogram, blood sugars, and electrocardiogram (ECG) were within normal limits.

Written informed consent was taken from the patient for both general anesthesia and regional anesthesia; the patient was fasted adequately. On the day of the surgery, the patient was premedicated with oral ranitidine 150 mg 2 h before surgery, with a sip of water. Emergency airway cart with a fiberoptic bronchoscope and l-gel was kept ready. In the operation room, all standard monitors, such as, the ECG, pulse oximeter, noninvasive blood pressure, and capnograph were placed, 18-gauge intravenous cannula was inserted and dextrose normal saline started.

Classical spinal anesthesia was attempted in sitting position with 23 g quinkeys spinal needle both midline and paramedian approach. Even after three attempts lumbar puncture was unsuccessful. We decided to try neuroaxial block under fluoroscopy. Patient was made to lie down in prone position with adequate cushioning, anteroposterior image with 20° ipsilateral tilt was used to identify left sided first sacral (S1) neuroforamina [Figure 1], 23 gauge quinkeys spinal needle was inserted under aseptic condition along c-arm axis, transforaminal placement was confirmed by seeing the urografin dye spread along the epidural space in lateral image and nerve sheath spread in AP image [Figure 2]. After injecting the epidural test dose with 3 ml of 2% lignocaine adrenalin 3 ml, bolus dose 0.5% 15 ml ropivacaine was injected.

Epidural anesthesia was adequate with sensory block up to T8 level; hemodynamic parameters were stable during the intraoperative period. Postoperatively, patient was stable, and he was discharged on the second postoperative day.

## Discussion

Ankylosing spondylitis is a disease that may deform any portion of the spine. The uniform development of widespread annular fibrous ossification and the formation of bony bridges (syndesmophytes) are largely responsible for the classic radiographic appearance of the “bamboo spine” of end-stage AS. Posterior longitudinal ligament and interspinous ligaments may become ossified to increase the rigidity of vertebral column. These changes can lead difficulty in airway management and administration of epidural or spinal anesthesia. Anesthesia reference books consider that anesthetic management, whether general anesthesia or more particularly regional anesthesia, is challenging and dangerous despite reports of the successful use of epidural anesthesia.<sup>[4-6]</sup>

Difficult airway is a challenge to anesthesiologists due to decreased range of cervical spine movement in patients of AS, is a major problem in anesthesia.<sup>[7]</sup> Cervical involvement, with limited movements, makes tracheal intubation difficult. A problem of tracheal intubation with a Magill laryngoscope in such cases is due to nonalignment of the oropharyngeal and laryngeal axis making intubation almost impossible. Forceful neck extension should be avoided, even under anesthesia, due to the risk of fractures, and the possibility of vertebrobasilar insufficiency, if possible cervical support can be used.<sup>[8]</sup>

Central neuraxial anesthesia is a valuable option in AS if appropriately applied. It requires the duration, site of surgery

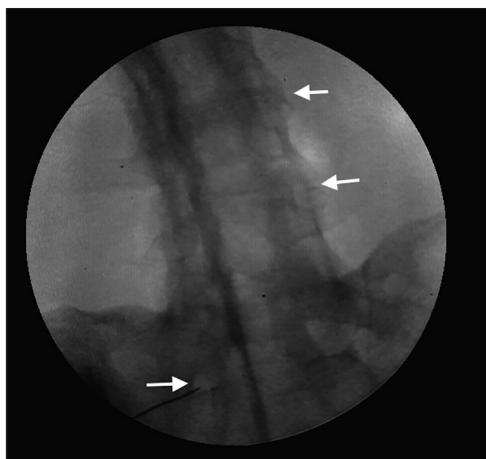


Figure 1: Posteroanterior fluoroscopic image of lumbosacral spine showing fusion of vertebral bodies and needle placement at left S1 neuroforamen

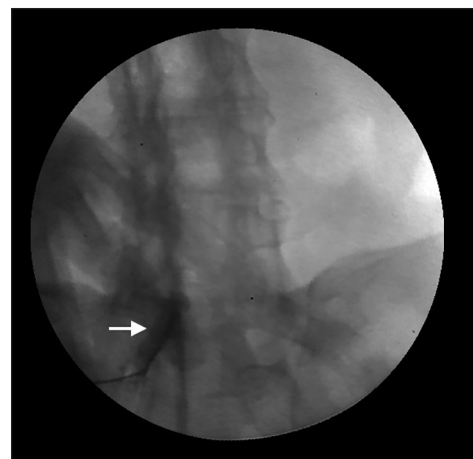


Figure 2: Posteroanterior fluoroscopic image of lumbosacral spine showing spread of dye along left S1 nerve root

to be defined precisely and easy and accessible anatomy and to incorporate both intraoperative and postoperative analgesia into a single approach. Central neuraxial block in AS is not new and has been used for appropriate surgery.

Wittmann and Ring considered epidural or spinal anesthesia to be contraindicated in AS because the placement of an epidural or spinal needle may be difficult or impossible due to ossification of interspinous ligaments and bony bridges and tracheal intubation may still be required should there be a complication from the regional technique, like local anesthetic toxicity due to intravascular injection or a unpredictable level of anesthesia.<sup>[9]</sup>

Neuroaxial blocks are technically challenging, due to limited mobility of vertebral column and ossification of the interspinous spaces and due to difficulty in positioning the patient. Technical difficulties can also increase the risk of complications.<sup>[10]</sup> Care is required during the administration of spinal anesthesia because high spinal and total spinal anesthesia, with respiratory insufficiency, have been reported. Cases of epidural hematomas after epidural anesthesia have been reported.<sup>[11,12]</sup>

In AS one can be successful in using the modified approach to central neuraxial block, the Taylor's approach, which is considered to be technically more difficult than the standard midline approach but very useful in degenerative disease of spine.<sup>[13]</sup>

In this case, fluoroscopy assisted epidural anesthesia was considered, as we failed to perform a subarachnoid block by the standard midline/paramedian approach, due to extensive midline calcification.

## Conclusion

Ankylosing spondylitis patients posted for surgery, pose several anesthesia challenges, in advance planning, necessary precautions will avoid these complications. The anesthesiologist should consider a safe and useful alternative option for airway management in patients with AS. However, neuraxial techniques should not be regarded as unachievable

even in difficult cases. Thorough discussion is required between the patient, surgeon, and anesthesiologist, about the potential risks and benefits of regional anesthesia and appropriate use of fluoroscopy and ultrasonography is useful in successful administration of central neuraxial anesthesia in AS.

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## Conflict of interest

There are no conflicts of interest.

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