

# Total Hip Replacement in a Case of Ankylosing Spondylitis: Anesthetist's Preparedness

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## Abstract

Ankylosing Spondylitis is an autoimmune seronegative spondyloarthropathy which manifests as a relapsing remitting disease. Since the disease involves the spine, it becomes significant for anesthesiologists as ensuring airway control in general anesthesia, and regional neuraxial blockade becomes difficult. Hence the anesthesiologist should be prepared beforehand with the anesthesia plan and the backup plan if the primary plan fails. In this report, we highlight the anesthetic management of a 66 year-old male who was a known case of ankylosing spondylitis and was planned for a total hip replacement

**Keywords:** Ankylosing Spondylitis; Anesthesiology; Remission; Neuraxial blockade; Epidural anesthesia; Hip replacement.

## INTRODUCTION

Ankylosing spondylitis, also known as Bechterew disease, is an autoimmune seronegative spondyloarthropathy. It manifests as periods of relapse of painful exacerbations ('flares') and periods of pain free remissions. It mainly involves the sacroiliac joint and vertebra, but peripheral arthritis and enthesitis can also be there. It is common in males with a high proportion carrying tissue type antigen HLA B27.<sup>1</sup> The clinical manifestations usually are backache, joint stiffness,

and possibilities of spinal cord compression and atlantoaxial subluxation. When painful degenerative changes occur in the hip, total hip arthroplasty (THA) has been shown to alleviate pain and improve function in AS patients.<sup>2</sup> Due to the involvement of the spine, regional anesthesia with spinal or epidural technique is usually difficult in these patients. Also, securing the airway by tracheal intubation can be challenging because the stiff neck and temporomandibular joint involvement render it further difficult. We report anesthetic difficulties in a geriatric patient with ankylosing spondylitis and anesthetist preparedness to manage the same.

## CASE REPORT

A 66 year-old male presented with a complaint of pain in the right hip for the past two months. The pain started following an accidental fall due to slipping on the floor, leading to a fracture of the neck of the right femur. The pain was severe enough to restrict the patient's mobility. He had a history of cervical ankylosing spondylitis for the last

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30 years, causing complete restriction of his neck movements. However, the patient was not on any DMARDs (Disease-modifying drugs). He also had hypertension for the last 15 years, for which he was taking amlodipine 10mg once daily. There was no other significant history. All the blood investigations were within normal limits. The cardiac evaluation was done to rule out any involvement and was found normal. Also, pulmonary function tests were done to rule out any restrictive pathology, and they were observed to be within normal limits. The patient was planned for a suitable total hip replacement. On radiological evaluation patient had a 'Bamboo spine', and all the cervical, thoracic and lumbar vertebrae were fused (Fig. 1). Thus we anticipated that inserting an epidural catheter for intraoperative and postoperative pain management would be difficult. Therefore we decided to keep general anesthesia with a definitive airway as the backup plan. On airway examination, the neck mobility was restricted (Fig. 2, 3); hence difficult endotracheal intubation was anticipated, and preparedness to manage it was done. The informed written consent was taken from the patient after discussing the anesthetic management plan for the surgery with risks explained in his local language. After confirming the fasting status, the patient was taken to the operation room on the day of surgery. We decided to attempt epidural catheter insertion, but as expected, we couldn't as the spine was completely fused. Then we decided to do awake endotracheal intubation. The patient was explained the same in the local language. The patient was rested on two pillows below the shoulders as he couldn't lie supine. We did bilateral superior



**Fig. 1:** Xray of the lumbar spine and hip joints- shows 'Bamboo lumbar spine'.

laryngeal nerve block with 2 ml of 2% lignocaine and instilled 2 ml of 4% lignocaine intratracheally. Injection glycopyrrolate 0.2 mg intravenous (i.v) and fentanyl 40mcg i.v were given, and 100% oxygen was applied via nasal prongs at a rate of 8 litres/minute. We secured the airway with a fiberoptic bronchoscope on the first attempt. After confirming the endotracheal placement with end-tidal carbon dioxide and on auscultation, injection propofol 70mg, injection fentanyl 100mcg and 8mg of injection vecuronium i.v were given, and anesthesia was maintained with oxygen/air and sevoflurane. Proper padding of all the pressure points was done to prevent neurological injury. The intraoperative course was uneventful. Upon completion of the surgery, extubation was done after the patient gained full consciousness and had good airway reflexes. The postoperative period was uneventful.



**Fig. 2:** Xray of the cervical spine showing fusion of the spine



**Fig. 3:** Shows the fixed position of the neck of the patient

## DISCUSSION

Ankylosing spondylitis is a chronic inflammatory disease for which patients usually present for joint replacement of knee or hip joints. The presence of syndesmophytes and enormous annular fibrous ossification leads to a classic 'bamboo spine' appearance. Due to the ossification of ligaments, continuous bony bars lead to spinal rigidity. This is especially important to anesthesiologists as it hinders both the regional anesthetic techniques due to difficulty in epidural or spinal needle placement, especially in the midline; also for the general anesthesia since taking control with definitive airway devices is difficult as neck mobility is restricted in these patients owing to cervical spine involvement. Stiffness of the cervical spine, atlantooccipital, temporal-mandibular, and cricoarytenoid joints may cause problems with tracheal intubation.<sup>3</sup> Several anesthesia textbooks consider any form of anesthesia, whether general or regional, hazardous despite reports of the successful use of caudal epidural anesthesia.<sup>4,5</sup>

A strong association has been found between the genetic marker HLA-B27 and AS. The incidence of HLA-B27 is less than one per cent in the general population, whereas it is present in more than 85% of patients with AS.<sup>4</sup>

There could also be extraarticular involvement in AS significantly because cost over tebral involvement could restrict ventilation, thus reducing lung capacities. Hence all patients should have preoperative pulmonary function tests to determine their lung capacities and compliance. Other extraarticular involvement can involve ocular, cardiac, neurological and other systemic involvements like amyloidosis.

It is essential to look for central and peripheral neuropathies and provide proper cushioning of the pressure points to avoid any new peripheral nerve injury. Considering all these factors, it is essential to have the algorithm for an anesthetic plan beforehand. The determining factors which impact the decision like upper airway involvement, any restrictive lung disease due to AS, the cardiac status of the patient and the extent of spine fusion.

The first step of taking a patient to the operating table can be challenging for these patients, as they cannot lie supine if there is extensive spine involvement like this patient. In such cases, back support with multiple pillows is necessary. Since it was lower limb surgery and also due to the excruciating pain patient is expected to have, the

regional anesthetic technique would have been the ideal plan. Still, the massive extent of spinal fusion hindered our plan. Regional anesthesia may be technically challenging owing to limited joints mobility and closed interspinous spaces, although ossification of the ligamentum flavum is uncommon in these patients.<sup>6,7,8</sup>

If the spine involvement is extensive, as in this patient, awake fiberoptic endotracheal intubation is the modality of choice as excessive cervical spine manipulation can cause spinal cord injury. But this needs the patient's cooperation and hence patient should be counselled and explained in detail all the steps. Another crucial part in this patient is monitoring the compliance of the lungs intraoperatively as it can alter the outcome if not appropriately managed.

## CONCLUSION

To conclude, the anesthetic considerations that should be considered in patients with ankylosing spondylitis are anticipated difficult airway access, cardiovascular involvement, any preexisting neuropathies and difficulty in neuraxial anesthesia.

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