

# Anesthetic Challenges in Ankylosing Spondylitis Patient with Multiple Comorbidities Posted for Surgery Under Neuronavigation

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## Abstract

Ankylosing spondylitis is a chronic, progressive autoimmune inflammatory disorder affecting the musculoskeletal system, can have large spectrum of underlying comorbidities. The multisystem involvement with Ankylosing spondylitis and Parkinson's disease has its own characteristic involvement of organs. Here is a case report of association of Ankylosing Spondylitis and Parkinson's disease with multiple comorbidities involving various other systems and anesthetic management of the same when he was scheduled for thoracic spine surgery for D9-D10 fracture under neuro-navigation in a prone position.

**Keywords:** Ankylosing spondylitis; Parkinson's disease; Multiple comorbidities; spine surgery.

## INTRODUCTION

Ankylosing spondylitis (AS) is a chronic, progressive autoimmune inflammatory disorder affecting the musculoskeletal system. It is most common in males, with a high proportion carrying tissue type antigen HLA B27.<sup>3</sup> Progression of the disease results in the development of fused, immobile spine. Organs commonly affected by AS, other than the axial spine and joints include Heart,

lungs, colon, and kidney.

Patients with Ankylosing Spondylitis and Parkinson's disease with multiple comorbidities present specific challenges to the anesthesiologist. The involvement of cervical spine by AS restricts the neck mobility and present with difficult airway. Cardiovascular complications are present in up to 3.5% of patients after 15 years of AS, and 10% after 30 years.<sup>5</sup> Involvement of pulmonary and cardiovascular systems and other autoimmune disease increases the anesthetic risk.

Parkinson's disease is a chronic, progressive neurodegenerative disorder. It affects approximately 3% of the population over 66 years of age. They often have postural instability, brittle and osteopenic bones<sup>1</sup>, making positioning difficult. Upper airway abnormalities and Restrictive lung disease secondary to chest wall rigidity are often seen. Drugs used in anesthesia may interact with anti-parkinsonian medication making the perioperative anesthetic management challenging.

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Here we report a successfully managed case of elderly patient with Ankylosing Spondylitis and Parkinson's disease with multiple comorbidities such as Hypertension, Type 2 Diabetes Mellitus, Bronchial Asthma, Hypothyroidism and Coronary artery disease with stent in situ, diagnosed with D9-D10 thoracic spine fracture for Posterior Instrumentation and fixation under neuro-navigation in prone position.

## CASE REPORT

A 62 year old male, ASA grade III had a history of fall and presented with back pain and difficulty in walking. He had history of Ankylosing spondylitis for 25 years with cervical Spondylitis and severe

restricted neck movement and neck in fixed flexed position. He had history of Hypertension, Hypothyroidism, and type 2 Diabetes Mellitus on treatment. He also had Bronchial Asthma for 20 years, on salbutamol inhaler on and off and Coronary artery disease for which he had undergone Percutaneous Transluminal Coronary Angioplasty (PTCA) insertion. He was diagnosed with Parkinson's Disease 2 years back and on anti-parkinsonian medications for 5 months. MRI revealed cervical spondylitis with fusion of vertebra (Fig. 1) and the thoracic vertebra fracture at D9-D10 level (Fig. 2). The patient was diagnosed with D9-D10 burst fracture and was scheduled for posterior instrumentation and fixation under neuro-navigation in prone position.



**Fig. 1:** Showing saggital image of whole body spine depicting burst fracture of D9-D10 vertebra

Preanesthetic Evaluation of the Airway revealed Mallampati class III, fixed flexion deformity of neck with loss of cervical and Lumbar lordosis with thoracic kyphosis. Patient cannot lie supine because of the fracture and the deformity of spine. Antiplatelet drug was discontinued.



**Fig. 2:** Showing saggital image of cervical spine depicting loss of cervical lordosis

On the day of surgery, preoperatively patient was nebulized with 4% lignocaine and inj glycopyrrolate given intramuscularly. Standard ASA monitoring attached and adequate preoxygenation done in the lateral position. Injection Fentanyl 2mcg/kg given, propofol 1-2mg/kg given in graded boluses

to preserve spontaneous breathing. Bag mask Ventilation achieved successfully. After adequate plane of anesthesia, patient turned supine, and airway was secured with 8mm flexometallic Endotracheal tube by video laryngoscopy. The Cormack Lehane grade was 1. Muscle relaxation given after intubation. Patient turned to prone position taking care of the cervical spine, thoracic spine fracture and brittle bones. Pressure points were adequately padded. Intravascular volume status closely monitored with intra-arterial blood pressure secured with 20G right radial artery cannulation.

Intraoperatively, patient had an episode of hypotension managed with fluid bolus. Patient was extubated when fully awake, obeying commands, adequate spontaneous breathing with return of airway reflexes. Patient shifted to Intensive Care Unit for further monitoring and medications was restarted. He was discharged after 1 week and follow up done.

## DISCUSSION

Anesthetic challenges in management of the rare occurrence of Ankylosing spondylitis with Parkinson's disease and multiple comorbidities for spine surgery has not been reported, probably the first case report in literature. There is imposed array of difficulties ranging from technical difficulty of the surgery, logistic difficulty, airway hazards, positioning difficulty, multisystem involvement, and drug interactions.

The anesthetic considerations in AS are the degree of upper airway involvement, difficulty in positioning and systemic involvement of the disease. Careful positioning is imperative because of osteoporotic bones. Studies have shown that AS is associated with increased risk of depression, dementia and ischemic stroke which is seen in our case.<sup>4</sup> Restrictive lung disease and chest wall abnormalities make ventilation difficult. The presence of Bronchial Asthma increases the risk of bronchospasm during airway handling. Diabetes mellitus, Hypertension, Hypothyroidism, Coronary artery disease complicates the anesthetic management. Tachycardia, hypertension, and hypotension should be avoided.

Patients with AS existed an elevated risk of subsequent Parkinson's disease which is present in our case.<sup>2</sup> They have autonomic dysfunction, hence close monitoring of fluids, intravascular volume should be done. There is risk of orthostatic Hypotension, hence measurement of arterial

pressure for postural variation should be done<sup>8</sup>, which could not be assessed in our case. The levodopa should be continued without interruptions. Drugs causing hypertension such as ketamine and inhalational agents with arrhythmogenic potential should be avoided. Drugs like metoclopramide, phenothiazine avoided as they are known to precipitate symptoms of Parkinson's disease. MAO (Mono Amino Oxidase) inhibitors inhibit the metabolism of narcotics; hence the dose of narcotics should be reduced by 20-25% of usual dose. There is a risk of Serotonin syndrome with the concomitant use of meperidine, hence avoided.

Airway maneuvers like head tilt, chin lift, head extension was not possible due to severe cervical spondylitis and fixed flexed neck position. The consent for awake fiberoptic intubation was not given, hence proceeded with video laryngoscope under sedation. There is similar study on airway management.<sup>7</sup> A stack of rolls were kept below the head to align the oropharyngeal and laryngeal axis (Fig. 3). The plane of anesthesia must be adequate for airway handling. The osteoporotic bones complicate the surgical handling and instrumentation, making it technically difficult. Under neuro-navigation and intraoperative imaging, the anesthetic plane, sterility, and radiation exposure of the medical personnel should be addressed.<sup>9</sup>

## CONCLUSION

Ankylosing spondylitis with Parkinson's disease and multiple comorbidities is more challenging to the anesthesiologist. Hence, In every plan for anesthesia, all necessary precautions should be undertaken and should consider a safe and alternative useful option for airway management and anesthetic management should be tailored accordingly to provide smooth recovery of the patient.

**Conflicts of interest:** None declared

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