Anaesthetic Management of 60-Year-Old Female with Ankylosing Spondylitis Undergoing a Restorative Surgery: A Case Report

Dr. Patel Akashkumar Mukeshbhai [1*], Dr. Sharad Goel [2], Dr. Vibhor Rai [3], Dr. Abhitasha V Gopal [4], Dr. Vibhav Gupta [5], Dr. Shubham Nagpal [6]

[1] Postgraduate Resident (Anaesthesiology), Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India
[2] Professor & HOD (Anaesthesiology), Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India
[3] Associate Professor (Anaesthesiology), Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India
[4-6] Postgraduate Resident(Anaesthesiology), Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India, India

* Corresponding Author: **Dr. Patel Akashkumar Mukeshbhai**

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Abstract
We present a case involving a 60-year-old woman who had significant deformities in her cervical, thoracic, and lumbar spines along with ankylosing spondylitis. To manage her gastroesophageal reflux disease (GERD) and improve her functional mobility and quality of life, she was admitted for restorative surgery on her thoracic and lumbar spines. We proposed a surgical intervention for her condition. Due to the presence of a difficult airway and the unsuccessful standard intubation approach, we chose to utilize the Spray As You Go (SAGO) technique with Awake Fiberoptic Intubation. A "difficult intubation" cart, equipped with nasopharyngeal and oropharyngeal airways, a cricothyroidotomy kit, a gum elastic bougie, a fiberoptic bronchoscope, and an intubating laryngeal mask (ILMA), was prepared for the procedure. There was no tachypnea, tachycardia, or hypoxia, and the patient was breathing spontaneously and tolerating the tube well. IV injections of propofol (2 mg/kg), fentanyl (2 µg/kg), and atracurium (0.5 mg/kg) were used to induce anesthesia. Using a modified Seldinger's approach, a triple lumen central venous catheter was used to cannulate the right femoral vein.

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Keywords: Ankylosing Spondylitis, Gastro Esophageal Reflux Disease (GERD), ILMA and SAGO

Introduction

Ankylosing spondylitis is a chronic inflammatory disease, most commonly observed in joints and the spine, and results in reduction of the physiological functions of the spine and surrounding tissues [1]. Inflammation related to ankylosing spondylitis in the cervical, thoracic, and lumbar regions damages the spine, resulting in kyphosis and stiffness. This situation presents challenges for the anesthesiologist regarding airway management and access to the neuroaxis [2].There is an increased risk of spinal cord compression during the procedure increases the risk both before and after surgery. Furthermore, the patient typically cannot lie in supine position [3]. In these situations, most anesthesiologists tend to administer general anesthesia. According to this study, the optimum method for managing airways is awake fiberoptic intubation, and the anesthesiologist finds it difficult to maintain proper spinal position in these patients [4].

Case report

With a 30-year history of progressive ankylosing spondylitis along with major cervical, thoracic, and lumbar spine deformities, a 60-year-old woman weighing 55 kg and approximately 155 cm tall was admitted to Saraswathi Institute of Medical Sciences, Hapur.

She was admitted for treatment of GERD as well as surgical correction of her thoracic and lumbar spine to improve her functional mobility and overall quality of life. The patient was admitted two days before the scheduled surgery. Respiratory exercise training was provided using an incentive spirometer. During the preanesthetic evaluation, her medical history indicated that due to her condition and involvement of the cervical spine, she required three pillows for head support. A physical examination revealed no neurological issues in the lower extremities, but significant cervical spondylitis was noted, impacting the thoracolumbar spine. The cardiovascular system showed no abnormalities.

The cervical spine's fixed flexion deformity made it impossible to perform the airway examination efficiently. The mouth could only open to the width of two fingers, and there was limited movement in the neck; the Mallampati classification was III. With the chin resting against the manubrium sternum, it was impossible to assess the thyromental distance. The range of motion in the neck was restricted to 0 degrees, and the front of the neck was not visible.

A fiberoptic intubation was scheduled while the patient was awake following a preoperative assessment for potential difficulties with intubation. X-rays of the vertebral column revealed calcification and ossification of the posterior ligaments along with surrounding soft tissues, deterioration of the anterior surfaces of the vertebrae, and fusion of the cervical, thoracic, and lumbar spinous processes, suggesting involvement of the posterior joints. Based on pulmonary function testing, the FEV1/FVC ratio was 64, indicating the presence of both restrictive and obstructive pulmonary conditions. The patient's relatives were explained about the presence of a difficult airway, the likely failure of the traditional approach for intubation, distorted airway anatomy with no access to perform a tracheostomy, and the high risks surrounding failure to obtain a definitive airway; consent was obtained. An awake fiberoptic intubation was scheduled using the spray-as-you-go (SAGO) technique. A difficult intubation cart equipped with various oropharyngeal and nasopharyngeal airways, a gum elastic bougie, a fiberoptic bronchoscope, an intubating laryngeal mask (ILMA), and a cricothyroidotomy kit was prepared. On the day of the operation, the patient received IV pantoprazole 40 mg, IV ondansetron 4 mg, and IV glycopyrrolate as premedication 30 minutes prior to surgery.

Preparation for fiberoptic intubation was done. Nasal airflow was assessed, and the nasal passages were treated with oxymetazoline nasal drops. In the operating room, the patient was positioned supine with the head properly supported on three pillows, and standard monitoring devices, including the electrocardiogram, non-invasive blood pressure monitor, pulse oximeter, and capnograph, were placed. An IV line was initiated using an 18-gauge cannula. After administering 5 milliliters of 4% lignocaine via nebulization for around 20 minutes, the patient was guided to gargle a 2% viscous lignocaine solution. While the patient was awake, a size 7 flexometallic endotracheal tube was utilized to secure the airway following a nasal fiberoptic intubation executed with the SAGO technique.

Air entry was confirmed through auscultation and capnography. The patient was breathing spontaneously and was managing the tube well,with no signs of tachypnea, tachycardia, or hypoxia. Anesthesia was induced with intravenous doses of propofol (2 mg/kg), fentanyl (2 µg/kg), and atracurium (0.5 mg/kg). A triple-lumen central venous catheter was inserted into the right femoral vein using a modified Seldinger's technique. The right radial artery was chosen for invasive blood pressure monitoring, where an arterial line was placed. Anesthesia was maintained with O_2, N_2O, isoflurane, dexmedetomidine injections, and a continuous infusion of intravenous atracurium. To avoid fractures, the patient was carefully positioned in the prone position using bolsters according to contour of the patient. The procedure proceeded without complications. The vital signs remained stable throughout.

The patient was diagnosed with severe lung disease, making blood pressure control and fluid management crucial. During the operation, the mean blood pressure was maintained within the range of 65 to 70 mmHg. The procedure lasted a total of six hours without any complications occurring intraoperatively. There was a blood loss of 300 mL; however, hemostasis was adequately achieved. Prior to closing the surgical incision, the surgeon placed the epidural catheter

under direct vision.

The patient was transferred to the intensive care unit for elective ventilation after surgery. Pain management included an epidural infusion of 0.2% ropivacaine at a rate of 6 mL/hour, a 25 mcg/h fentanyl patch, IV paracetamol at a dose of 1 g three times daily, and tramadol 50 mg three times a day. After collecting 800 mL of fluid from the wound site, the patient's hemoglobin dropped to 8.4 mg%; consequently, two units of packed red blood cells were transfused, raising the hemoglobin level to 11.2 mg%. Within the next 24 hours, the patient was successfully weaned off the ventilator and extubated without complications.

Discussion

AS is a group of chronic inflammatory disorders that occurs in the spines and sacroiliac joints, termed spondyloarthropathies [5]. This disease mostly occurs in women compared to men. It may cause arthritis, uveitis, psoriasis, cardiovascular diseases, and cardiomyopathy [6].

The symptoms of AS are chronic pain in joints and spines which reflect the reduction of physiological functions of spines and surrounding tissues [7]. Inflammation and subsequent harm in the cervical, thoracic, and lumbar regions of the spine lead to stiffness and kyphosis. The risk factors associated with AS include gender, age, environmental influences, and genetic predisposition. The anesthesiologist faces difficulties in securing airways in this condition due to the fixed cervical spine and limited range of motion [8, 9]. Generally, in such circumstances, most anesthesiologists prefer general anesthesia to prevent neuroaxial complications.

According to our research, the most effective method for managing airways is awake fiberoptic intubation. For the anesthesiologist, maintaining proper spinal position in these patients can be difficult [10]. In this study, evaluations for challenging intubation were performed before the operation, leading to the decision for awake fiberoptic intubation. The radiographs of our patient's spine revealed calcification and ossification of the posterior ligaments along with adjacent soft tissues, reabsorption of the anterior surfaces of the vertebral bodies, and fusion of the cervical, thoracic, and lumbar spinous processes, suggesting involvement of the posterior joints [11]. The challenge of tracheal intubation is influenced by the extent of spinal involvement. Extra care was taken to avoid excessive manipulation of the neck to prevent potential spinal cord injury. We opted for awake fiberoptic intubation utilizing the spray-as-you-go (SAGO) technique [12]. A difficult intubation cart, equipped with a variety of oropharyngeal and nasopharyngeal airways, a gum elastic bougie, a fiberoptic bronchoscope, an intubating laryngeal mask (ILMA), and a cricothyroidotomy kit, was kept ready.

Conclusion

Patients suffering from chronic spinal diseases present particular challenges for anesthesiologists. Managing airways and accessing the neuroaxis can prove to be difficult. To avoid complications with the neuroaxis, most anesthesiologists choose to use general anesthesia for these patients. The difficulty in performing tracheal intubation is dependent by the extent of spinal involvement. Extra care must be taken to minimize excessive movement of the neck, as this could potentially harm the spinal cord. Our case demonstrates that in certain instances of ankylosing spondylitis, it is possible to effectively utilize a fiber optic bronchoscope for airway management, which is generally regarded as technically more complex.

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