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Research Paper

Mediastinoscopic Thymectomy – An Anaesthetic Challenge

Dr. Pooja Bhosle[1], Dr. Chinmay Godbole[2], Dr. Shubhada Aphale[3]
[1]Associate Professor, [2]Chief Resident, [3]Professor and Head
Department of Anaesthesiology Bharati Vidyapeeth University Medical College, Pune Maharashtra

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ABSTRACT:- Myasthenia Gravis is an autoimmune disease characterized by progressive weakness of skeletal muscles with improvement following rest. The incidence is 50-142/million population with a female preponderance. We report a case of a 34 year female - diagnosed as Myasthenia Gravis who was receiving the treatment, was investigated in details and optimized. She was posted for right mediastinoscopic excision of thymoma. General Anaesthesia with one lung ventilation was planned. Thoracic epidural catheter was inserted for intraoperative and post-operative analgesia. One Lung Ventilation was achieved with left sided Double Lumen Tube (DLT) for better visualization of the operative field. Intraoperative haemodynamics were maintained using Sevoflurane and Epidural top-ups of Local Anaesthetics. After completion of the surgery, (right lung was re-inflated) DLT was replaced with a cuffed Portex ETT. Patient was shifted to ICU on ventilatory support and was extubated on the 2nd post-op day. She was haemodynamically stable post-operatively and was eventually shifted to the wards on the 3rd post-op day

Keywords:- Myasthenia Gravis, thymoma, double lumen tube, thoracic epidural
Key Messages The key to uneventful anaesthesia lies in understanding the pathophysiology of disease, interactions with the drugs required intraoperatively & vigilant monitoring. The outcome of the surgery depends on successful teamwork between surgeons, anaesthesiologists, & OR staff.

I. INTRODUCTION

Myasthenia Gravis is a chronic autoimmune disorder caused by a decrease in functional acetylcholine receptors at the neuromuscular junction due to their destruction or inactivation by circulating antibodies. 70 – 80% of the functional acetylcholine receptors can be lost, and this accounts for the weakness and easy fatigability of these patients. It has a prevalence of 1 in 7500. Women 20 to 30 years of age are often affected, whereas men older than 60 years of age are affected. [1] There is a striking association between Myasthenia Gravis and hyperplasia of the thymus, with more than 70% of these patients having thymus hyperplasia and 10% having thymoma. [2] Thus, thymectomy is a widely accepted therapy for patients with Myasthenia Gravis. Although trans-sternal and trans-cervical thymectomy has been a standard approach for many years, recent advances of endoscopic techniques have facilitated less invasive approaches to thymectomy. [3, 4, 5, 6] We are reporting a case of mediastinoscopic thymectomy.

II. CASE HISTORY

A 35 yr female (Weight = 42kg) came with chief complaints of progressive weakness of left upper limb and ptosis in the left eye. The complaints had a waxing and waning course since the past two years. She was diagnosed as Myasthenia Gravis with thymoma and had approached our hospital for excision of the same. The diagnosis was confirmed with Neostigmine Test, Decrement Studies and Acetyl Choline Receptor Antibody levels. Neostigmine Test was positive. Decrement Studies showed evidence of Neuromuscular Junction Defect. Acetyl Choline Receptor Antibodies were 16.14nM/L (positive - >0.4). HRCT Thorax revealed a 5 X 3.7 X 2.3 cm. well defined heterogeneous & hypodense mass seen in anterior mediastinum not separated from the thymus gland. It showed coarse calcified changes in the mass. The lesion was behind the sternum in front of the base of right ventricle, ascending aorta, arch of aorta and inferior vena cava. The findings were suggestive of thymic mass, most likely thymoma.

Patient was treated with Tab Pyridostigmine 60 mg TDS, Tab. Prednisolone 40 mg OD and Tab. Azathioprine 50 mg OD. But, the treatment was taken irregularly. Hence there were waxing & waning in the

symptoms. She was evaluated for routine hematological investigations before posting for surgery (Mediastinoscopic Thymectomy)

One lung anesthesia with a thoracic epidural was planned with proper preoperative evaluation & systemic examination. The relatives were explained the risk of the surgery and consent taken. She was shifted to OR after securing an 18G intracath and premedicated with Inj. Glycopyrrolate 0.2 mg intramuscular, 45 min prior to procedure. After taking all aseptic precautions, Central Venous Line was secured on right side for CVP monitoring and Left Radial Artery was cannulated. Monitors were attached for continuous IBP, ECG, $EtCO_2$, SpO_2 & temperature monitoring. Epidural catheter was inserted at $T_7 - T_8$ interspace in sitting position with aseptic precautions. It was fixed at 7 cm at skin for intraoperative and postoperative analgesia.

Preinduction: Inj. Ondansetron 4 mg , Fentanyl 40 µg , Midazolam 0.5 mg were given intravenously. She was preoxygenated for 3 minutes and was induced with Inj. Propofol 150 mg. Patient was paralyzed with Inj. Vecuronium 2 mg and intubated with Left sided 35 Fr Double Lumen Tube. Air entry was checked bilaterally and unilaterally with blocking the bronchial and tracheal ports respectively. Tracheal cuff was inflated with 3 ml, and bronchial cuff with 1 ml of air. Sidestream Capnometer was attached to the tube.

After positioning in left lateral, the right lung was collapsed for better visualization of the surgical field for nearly 1 hour and 30 min. All the precautions for one lung anaesthesia were taken and vigilant monitoring was done throughout the procedure. She was maintained on O_2 (33%), N_2O (66%), Sevoflurane (1 to3%) and intermittent Inj. Vecuronium (0.4mg). Intraoperative analgesia was given with epidural top-ups of Inj. Bupivacaine 0.125% 6 ml + 4 ml at an interval of 50 minutes. Intra-operatively 2.5 L of crystalloid was infused and patient was haemodynamically stable throughout the procedure. There was no blood loss because of minimally invasive surgery inspite of the presence of highly vascular structures around.

At the end of the surgery, bronchial and tracheal cuffs were deflated and the double lumen tube was replaced with Portex ETT No. 7 for elective postoperative ventilation. Patient was shifted to ICU for further monitoring. In the ICU she was haemodynamically stable without any untoward complication and was extubated the next day & started on Tab. Pyridostigmine. Epidural catheter was removed on 3rd post operative day which provided continuous analgesia for 3 days. Patient was discharged uneventfully on 10th day.

Discussion:

Video Assisted Mediastinoscopic Thymectomy is a new alternative to thoracic surgery for patients of Myasthenia Gravis. Kido and co-workers performed this technique in 3 patients of anterior mediastinal mass without one lung ventilation. [7] We used One Lung Anaesthesia for Video Assisted Mediastinoscopic Thymectomy for optimal surgical conditions.

Video Assisted Thoracoscopic Thymectomy was done under GA by EL- Dawlatly AA et al with non neuromuscular relaxant technique (NMRT) with OLV and thoracic epidural analgesia (TEA). [8] In our case, we used the neuromuscular blocking drugs, the requirement of which was significantly reduced (50% of normal) & GA was supplemented with TEA. The use of neuromuscular blockers was mandatory in our case due to nature and site of surgery.

The key to uneventful anaesthesia lies in understanding the pathophysiology of disease, interactions with the drugs required intraoperatively & vigilant monitoring.

We conclude that video assisted mediastinoscopic thymectomy can be performed with OLV & TEA with minimal doses of muscle relaxants & vigilant monitoring. Though the use of peripheral nerve stimulator is strongly recommended in these cases, it was not used due to unavailability of working instrument.

The outcome of the surgery depends on successful teamwork between surgeons, anaesthesiologists, & OR staff. The VAT surgeries for thymectomy minimize the morbidity having less surgical trauma & consequently, lesser post-op pain, shorter hospital stay, better cosmetic results & hence, better acceptance. [9]

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*Corresponding Author: Dr. Pooja Bhosle