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Anaesthetic management of Video as sisted Thoracoscopic Thymectomy in myasthenia gravis

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ABSTRACT

Anesthesia for videoassisted thoracoscopic thymectomy (VATT) in myasthenia gravis is challenging. The anesthetic experience of that technique is quite large. It involves either muscle relaxant or non-muscle relaxant techniques. However, the literature is deficient of standard anesthetic technique for VATT. Therefore To the best of our knowledge, we presented this report a muscle relaxant technique with TOF-Watch for VATT under general anesthesia using fentanyl and propofol for induction using one lung ventilation with Double lumen tube (DLT).Patient extubated and shifted to post operative ward and discharged 3 rd postoperative day

Keywords: Video assisted thoracoscopic thymectomy (VATT), TOF-Watch, myasthenia gravis.

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INTRODUCTION

Myasthenia gravis (MG) is an autoimmune disease characterized by release of antibodies against acetylcholine receptor at the neuromuscular junction (NMJ). Anaesthesia for MG is challenging for anaesthesiologists because of drug interaction with various aesthetic agents namely muscle relaxants. Several reports have been written on anaesthesia and critical care management of myasthenia patients undergoing trans-sternal thymectomy. However, very few on (VATT). The techniques of anaesthesia for thymectomy in myasthenia gravis could be either with or without muscle relaxants. But we are using muscle relaxant technique with TOF-Watch. (VATT) has been recently introduced and slowly is getting popularity. That warrants revisiting and modifies our aesthetic technique. This report will focus on the muscle relaxant anaesthetic technique with TOF-Watch using one lung ventilation with DLT (double lumen tube) for VATT in myasthenia gravis patients [1,2].

Case 1

A 65-year-old male patient came with drooping eyelids, generalized weakness was a diagnosed case of myasthenia gravis with evidence of an increased anti-Ach-R antibody titre of 5.64 nmol/L (N<0.25) and a significant detrimental response to the nerve conduction study. Started on tab. pyridostigmine 30mg three times daily and tab prednisone.

Patient also undergone after few months patient came to casualty with severe dyspnoea, dysphagia respiratory failure discussion with anaesthetist intubated and shifted to IRCU. Received five cycle of (IV) IgG 0.4 g/kg in addition to pyridostigmine 60 mg QID. pyridostigmine continued. Marked improvement occurs patient then extubated and discharged. Meanwhile, his computed tomography (CT) of the thorax and neck revealed an anterior mediastinal mass of size 2.8 × 1.6 × 4.9 cm, most likely thymoma. Due to poor response to medical management, the patient was electively posted for VATT.

Preanaesthetic evaluation was done. Four session of Plasmapheresis (to improve the symptoms. Indirectly perioperative complications) given.

The patient gave history of dyspnoea and dysphagia even for liquids hence he was put on Ryle's tube (RT) feed and medications. His routine blood investigations, electrocardiogram (ECG), chest X-ray (CXR), 2D Echo, baseline arterial blood gas (ABG), and room Air oxygen saturation (SPO2) were normal. Pulmonary function test (PFT) could not be done. Breath holding time was < 20 sec.

Patient was posted for surgery with informed risk of postoperative ICU stay and ventilatory support to `relatives. On the day of surgery, the patient omitted anticholinesterase does and steroids continued. An IV line with 16-G cannula venous line were secured. The patient was premeditated with im midazolam 5 mg half hour before. Antiemetic metaclopramide10 mg and cefotaxime 1 g IV. The patient was induced with Fentanyl 2ug/kg IV and propofol 100 mg IV. The larynx was sprayed with 10% xyloidine. The trachea was intubated with 37 F left sided DLT ported double lumen tube (fig 1).

Fig 1 Showing double lumen tube (DLT)

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Anaesthesia was maintained with O2/Air/ Desflurane (4–5 MAC).2/3 dose of vecuronium 4mg muscle relaxant given. Muscle relaxant dose titrated response at NMJ monitored with a TOF-Watch. (Fig 2) TOF-Watch showing train of four TOF 0% means all muscle fibres are paralyzed. It works by giving supramaximal stimulus through skin electrode stimulating peripheral nerve with current of 2 HZ for 2 sec i.e. 4 stimuli at 0.5 second interval[2]. So absent twitch to stimulation will show 100 % paralyzed.

Heart rate (HR), electrocardiogram (ECG), non-invasive blood pressure (NIBP), oxygen saturation (SpO2) and end tidal carbon dioxide (EtCO2), were monitored. Surgery was performed in the left decubitus position with three ports of a video-assisted thoracoscope (VAT). Right lung isolation was provided during surgery. After 20 min Patient start desaturation immediately desflurane cutoff 100% oxygen given, Tube position checke after 30-40 scds spo2 recovers to 100% after that patient maintained on 02/ air and propofol IV infusion.

Fig 2 showing TOF (Train of four) 0. muscles paralized completely

After around 80 mins TOF-Watch show TOF 100% showing (fig 3) full recovery from muscle relaxant (table 1). So only one dose is given no repetition of muscle relaxant needed. Surgery lasted for 60min without significant blood loss. Patient reversed with neostigmine and glycopyrolate waited till full recovery, reversed and extubated on table shifted to post-operative surgery ICU, no pulmonary complication, anticholinesterase started. Adequate analgesia and physio-therapy given.

Fig 3 .. TOF Train of four showing 100% ..recovery from muscle relaxant

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Table 1: PTC- post tetanic contractions, TOF- train of four

Time	preoperative	After induction	30 mins	60 mins	After reversal
TOF	57	0	0	2	100
PTC	-----	0	12	----	-----

Case 2

A 60 yrs. male patient came with complaint of difficulty in swallowing which was insidious and progressive for both solid and liquid for 15 days. Difficulty in breathing, Dysarthria, limb weakness with dyspnoea, No fever. He was DM on treatment. Patient was intubated and managed in IRCU in view of respiratory depression. Provisional diagnosis of myasthenia crisis was made. Repetitive nerve stimulation showed significant detrimental response. Patient initiated on IV IgG. Anti AChR antibody report were positive 26.09 nmol/L (positive > 0.40 nmol/L. After the patient was on T. Pyridostigmine and T prednisone, MRI chest (fig 5) showed Evidence of well-defined anterior mediastinal mass lesion measuring 5.0 x 3.4cm possibility of thymoma. Patient improved weaned out of ventilator observed in general ward and then discharged. Patient was advised thymectomy after 2-3 months.

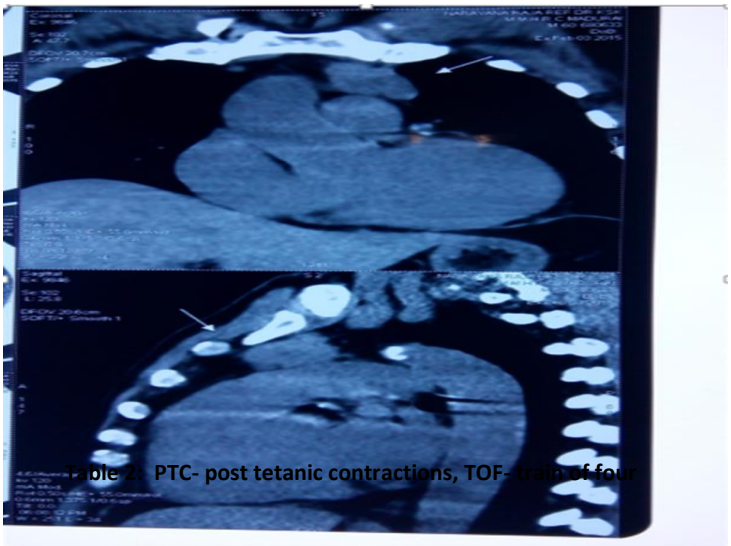

Table 2: PTC- post tetanic contractions, TOF- train of four

Fig 5 MRI Chest

Table 2: PTC- post tetanic contractions, TOF- train of four

Time	Pre-operative	After induction	30 mins	60 mins	After reversal
TOF	57	0	0	0	0
PTC	-	0	0	0	0

VATT surgery planned. Postoperative ventilator consent taken. Complete blood count done, LFT, RFT - N 2 D Echo done showing concentric LVH, EF- 65%.

Chest x ray normal. On day of surgery morning dose of neostigmine and prednisone stop. IM midazolam 5mg/kg given half-hour before, antiemetic prophylaxis given. Patient induced with IV fentanyl 2 mg/ kg and IV propofol 100 mg.2/3 dose of IV vecuronium 4mg /kg given and the larynx was sprayed with 10% xyloidine. The trachea was intubated with 35 F left sided DLT portex double lumen tube. Anaesthesia was maintained with O2/Air/ Sevoflurane 2 MAC). Patient put on right lateral position. Before giving muscle relaxant TOF was 57 % in TOF watch (table 2). Mass was attached to the upper lobe of left lung so pleura opened and both side ICD inserted. Muscle relaxant dose titrated response at NMJ monitored with a TOF-Watch. Patient not extubated because PCT was 0 after reversal (Fig4) and shifted to IRCU for post-operative ventilation subsequently patient was extubated on 1 st postoperative day and shifted to ward and. B/L chest

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drain removed. Adequate pain controlled and physiotherapy given.resum on oral anticholinesterase and steroid. Discharged 3 rd postoperative day

Fig 4 Showing PTC 0 after reversal from muscle relaxant

DISCUSSION

MG is Uncommon Chronic Autoimmune Disease. Women tend to get affected it Earlier (20 – 40) and Men get it later (70 – 80).Main pathophysiology is decrease in Functional acetylcholine receptors at The neuromuscular junction due to their destruction or inactivation by circulating antibodies (Fig 4). The hallmarks is weakness and rapid exhaustion of voluntary muscles with repetitive use followed by partial recovery With rest. (3, 4)

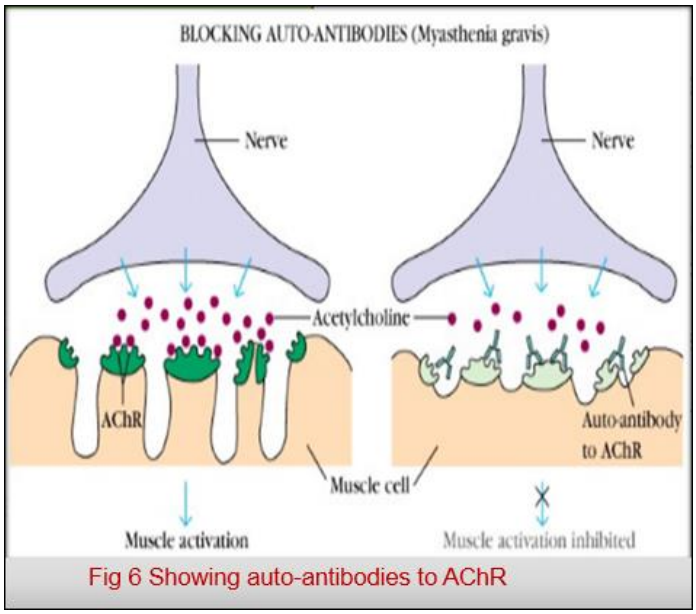

Fig 6 Showing auto-antibodies to AChR

Trans-cervical, trans-sternal maximal thymectomy is an established surgery for generalized myasthenia gravis. More recently thoracoscopic thymectomy has been introduced as a less invasive technique for the management of myasthenia gravis and also as an alternative to conventional trans-sternal approach. Thoracoscopic thymectomy offers several advantages compared to open technique, namely, less

postoperative morbidity, minimal discomfort, rapid functional recovery, shorter postoperative hospital stays and reduction of hospitalization cost. Also VATT offers excellent cosmetic healing compared to sternotomy. In the literature there are many publications on the anaesthetic management of trans-sternal thymectomy. However, very few on VATT. Our current anaesthetic technique includes general anaesthesia with muscle relaxant monitored by TOF-Watch , with one lung ventilation for such less invasive surgery, hence we could able to extubate patient on table without respiratory complications [5,6].

CONCLUSION

Anaesthesia for thymectomy in myasthenia gravis is challenging.so proper preoperative preparation, Use muscle relaxant technique with TOF-Watch for newer technique like video assisted thoracoscopic thymectomy provided excellent intubating operating and postoperative conditions.

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