

ANESTHESIA FOR THORACOSCOPIC THYMECTOMY: MODIFIED NON-MUSCLE RELAXANT TECHNIQUE

- Case Reports -

ABDELAZEEM A. EL-DAWLATLY*

Abstract

Anesthesia for thymectomy 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 thoracoscopic thymectomy. Therefore we present in this report a modified non-muscle relaxant technique for thoracoscopic thymectomy (TT). We report two cases who underwent TT under general anesthesia using sufentanil and propofol for induction and local anesthesia spray to the vocal cords to facilitate endobronchial intubation using non-muscle relaxant technique. The intubating, operating and postoperative conditions were excellent. To the best of our knowledge, this is the first report on modified non-muscle relaxant technique for TT in myasthenia gravis. Further cases have to be done to verify our technique.

Keywords: Myasthenia gravis; thymectomy; anesthesia.

Introduction

Myasthenia gravis (MG) is an autoimmune disease characterized by release of antibodies against acetylcholine receptor at the neuromuscular

* Associate Prof., College of Medicine, King Saud Univ., Riyadh, KSA.
Address for correspondence: Abdelazeem El-Dawlatly, Associate Professor, College of Medicine,
King Saud University, Riyadh: 11461, P.O. Box: 2925, E-mail: dawlatly@ksu.edu.sa.

junction (NMJ). Anesthesia for myasthenia gravis is challenging for anesthesiologists because of drug interaction with various anesthetic agents namely muscle relaxants. Several reports have been written on anesthesia and critical care management of myasthenic patients undergoing trans-sternal thymectomy¹⁻³. However, very few on thoroscopic thymectomy⁴. The techniques of anesthesia for thymectomy in myasthenia gravis could be either with or without muscle relaxants. In 1994, we have adopted non-muscle relaxant technique for trans-sternal thymectomy⁵. Since that time more cases were done using the same technique with very encouraging results.

Thoroscopic thymectomy (TT) has been recently introduced and slowly is getting popularity. That warrants revisiting and modifies our anesthetic technique. This report will focus on the modified non-muscle relaxant anesthetic technique for thoroscopic thymectomy in myasthenia gravis patients.

Case 1

A 23-year-old female weighing 60 kg known to have myasthenia gravis. The disease started 1 yr previously with ocular symptoms and then she had generalized muscle weakness. At one stage she developed respiratory failure and bulbar involvement where the trachea was intubated and she was admitted to critical care area for ventilatory support. The diagnosis of myasthenia gravis was made based on the severity of her symptoms. She started medical treatment in the form of pyridostigmine (60 mg, 6 hourly) and prednisolone (20 mg once a day) with marked improvement of her symptoms. The patient was posted for TT under GA.

Her preoperative laboratory investigations and ECG were within normal limits. Chest CT scan showed thymus enlargement. Pyridostigmine was continued as usual and three sessions of plasmapheresis were performed preoperatively.

Premedication was achieved with oral lorazepam 1 mg 1 hr preoperatively. In the operating room, peripheral and arterial cannulae

were inserted. Right internal central venous catheter was inserted after induction of general anesthesia. Monitoring included, non-invasive monitoring of blood pressure, ECG, pulse oximeter, intra-arterial and central venous pressure monitoring.

Induction of anesthesia was achieved with sufentanil (10 mcg) followed by propofol (200 mg), while she was breathing 50% O₂/air/sevoflurane at 1 MAC. Laryngoscopy was performed and the larynx was sprayed with xylocaine 10%. Due to non-availability of LTA (laryngo tracheal analgesia cannula) which we use usually for local anesthesia of the tracheo-bronchial tree, the trachea was intubated with single lumen tube and 15 cc of xylocaine 2% was instilled through the tube followed by controlled ventilation to ensure equal distribution of local anesthetic. Two min later, single lumen tube was removed and left sided DLT was inserted and checked by auscultation and fiberoptic bronchoscope (FOB). Anesthesia was maintained with sufentanil infusion running at 5 mcg/hr and propofol infusion at 100 mg/hr. The patient underwent uneventful thymectomy for 3 hr. The trachea was extubated.

She was then transferred to the surgical intensive care unit (SICU). Postoperative analgesia was achieved with ketoprofen 100 mg/i.m/12 hr. In the first postoperative day her chest-x-ray showed right upper lobe collapse, due to secretions, where the trachea was intubated and fiberoptic bronchoscope suctioning was performed followed by tracheal extubation. Her postoperative period was smooth and the chest tube was removed on the second postoperative day.

Case 2

A 21-year-old female (weighing 58 kg) known myasthenia gravis disease for the previous 2 yr. She was on medical treatment which included pyridostigmine and prednisolone. She was scheduled to undergo TT.

Preoperative hematological profile and ECG were normal. Pulmonary function tests revealed restrictive airway pattern.

Premedication achieved with oral lorazepam 1 mg, 1 hr prior to surgery. In the operating room, her body temperature was maintained with water heated mattress. After placement of the ECG and automated blood pressure cuff, intravenous and arterial cannulae were inserted under local anesthesia. Anesthesia was induced with sufentanil 0.1 mcg/kg followed by propofol 3 mg/kg body weight while she was breathing 50% O₂/air through a Magill anesthetic circuit. Direct laryngoscopy was then performed and the larynx was sprayed with 4% lignocaine 2-4 ml using a laryngo-tracheal analgesia cannula (LTA, 24 laser pores, Abbott, USA). Two minutes later, the trachea was intubated with a left sided DLT (Fr 35) which was checked by auscultation and FOB. Anesthesia was maintained with propofol infusion 6-12 mg/kg/hr. Incremental dose of 10 mcg sufentanil was given if required. Surgery lasted uneventfully for 2 hr and at the end the trachea was extubated and the patient was transferred to the SICU. Postoperative analgesia was achieved with i.m ketoprofen. The patient made uneventful recovery.

Discussion

Trans-cervical, trans-sternal maximal thymectomy is an established surgery for generalized myasthenia gravis. More recently thoroscopic 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. Thoroscopic 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 TT offers excellent cosmetic healing compared to sternotomy^{6,7}.

In the literature there are many publications on the anesthetic management of trans-sternal thymectomy. However, very few on thoroscopic thymectomy. Classically, anesthetic technique for thymectomy could be either, muscle relaxant or non-muscle relaxant technique. The myasthenic patient is sensitive to non-depolarizing neuromuscular blockers and resistant to depolarizing ones^{8,9}.

We have first coined and adopted non-muscle relaxant technique combined with thoracic epidural analgesia (TEA) and light general anesthesia in 1994⁵. During earlier phases of TT, we have used the same non-muscle relaxant technique combined with TEA, on the assumption that it could be converted to open surgical technique at any time during the procedure¹⁰. However, later we have modified our technique which we present in this report to be non-muscle relaxant without TEA. Our current anesthetic technique includes, non-muscle relaxant approach, intubating the trachea with DLT after LTA spray, and continuous infusion of propofol and sufentanil.

In the first case described above and due to lack of LTA kit, we have intubated the trachea with single lumen tube and through it we instilled xylocaine 2% 15 cc for local anesthesia of the tracheo-bronchial tree to facilitate endobronchial intubation with minimal stress response. We advocate this method in case of non-available LTA kit. In both cases, lung deflation was complete and did not require capnothorax insufflation. In case incomplete lung deflation exist, we do recommend use of capnothorax at pressure < 10 mmHg^{11,12}.

In conclusion, anesthesia for thymectomy in myasthenia gravis is challenging. Use of modified non-muscle relaxant technique for thoracoscopic thymectomy provided excellent intubating operating and postoperative conditions.

References

1. ABE S, TAKEUCHI C, KANEKO T, ET AL: Propofol anesthesia combined with thoracic epidural anesthesia for thymectomy in myasthenia gravis-a report of 11 cases. *Masui*; 50:1217-20, 2001.
2. BARAKA A: Anaesthesia and myasthenia gravis. *Can J Anaesth*; 39(5):476-86, 1992.
3. ABEL M AND EISENKRAFT JB: Anesthetic implications of myasthenia gravis. *Mt Sinai J Med*; 69:31-37, 2002.
4. YIM AP, KAY RL, IZZAT MB, NG SK: Video-assisted thoracoscopic thymectomy for myasthenia gravis. *Semin Thorac Cardiovasc Surg*; Jan. 11(1):65-73, 1999.
5. EL-DAWLATLY A, ASHOUR MH: Anaesthesia for thymectomy in myasthenia gravis: A non-muscle relaxant technique. *Anaesth Intens Care*; 22:458-460, 1994.
6. SABBAGH MN, GARZA JS, PATTEN B: Thoracoscopic thymectomy in patients with myasthenia gravis. *Muscle Nerve*; 18:1475-7, 1995.
7. MACK MJ, LANDRENEAU RJ, YIM AP, HAZELRIGG SR, SCRUGGS GR: Results of video-assisted thymectomy in patients with myasthenia gravis. *J Thorac Cardiovasc Surg*; 112:1325-60, 1996.
8. BARAKA A, SIDDIK S, KAWKABANI N: Cisatracurium in a myasthenic patient undergoing thymectomy. *Can J Anaesth*; 46:779-782, 1999.
9. BARAKA A, BAROODY M, YAZBECK V: Repeated doses of suxamethonium in a myasthenic patient. *Anaesthesia*; 28:782-784, 1993.
10. EL-DAWLATLY A, ALKATTAN K, HAJAR W, ET AL: Anesthetic implications for video-assisted thoracoscopic thymectomy in myasthenia gravis. *Internat J Anesthesiol*; 8(1), 2004.
11. EL-DAWLATLY AA, ET AL: Thoracoscopic Sympathectomy: Endobronchial Anesthesia vs Endotracheal Anaesthesia with CO2 Insufflation. *J of Anesthesia*; 16(1):13-16, 2002.
12. EL-DAWLATLY AA, ET AL: Right vs left side thoracoscopic sympathectomy: Effects of CO2 insufflation on hemodynamics. *Annales Chirurgie Gynecologie*; 90(3):206-208, 2001.