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Myasthenia gravis patient presented for thyroid surgery – what could go wrong?

KEYWORDS: Complications, Intubation, Myasthenia gravis, Thyroid surgery,

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ABSTRACT *When anesthetic management for myasthenia gravis patients presented for thyroid surgery is revealed several issues should be taken into consideration: patient medical history, preoperative therapy, airway management, the use of neuromuscular relaxants, usage of opioid anesthetics and possible complications. We present, 65-year-old female with long term myasthenia gravis and tracheal resection who underwent two interventions for thyroid surgery on two separate interventions. Patient for the both surgeries underwent different preoperative neurological preparation and two different induction and anesthesia techniques (with and without muscle relaxant anesthesia). Postoperative complications after the both surgeries are also reported. In conclusion we might say that Myasthenia gravis patients are real anesthetic challenge and thir course is unpredictable and correlated to many aspects.*

Introduction:
Myasthenia gravis (MG) is a chronic autoimmune disease characterized by a decrease in acetylcholine receptors at the neuromuscular junction secondary to destruction or inactivation by circulating antibodies [1, 2].

Patients with MG, undergoing major surgeries are very delicate. However depending on the myasthenia stage and type of surgery, several contemporary issues should be taken into consideration: patient medical history, preoperative therapy, airway management, the usage of neuromuscular relaxants, usage of opioid anesthetics and optimization of the patient.

Some data reveal that most of the myasthenia patients might have some kind of thyroid gland disorders. On the other hand, patients scheduled for thyroid surgery are challenging for airway management and intubation. Many authors suggest that when difficult intubation is expected and might be needed, succinylcholine is still golden standard for intubation [4,5]. However, the use of succinylcholine in myasthenia gravis is not recommended [6].

Also, most of the postoperative complications of thyroid gland surgery that incorporate postoperative bleeding, tracheomalatia, damage of the recurrent laryngeal nerve, laryngeal edema, superior laryngeal nerve damage and pneumothorax directly interfere and result in reintubation and prolonged mechanical ventilation [7]. These complications in many aspects are similar to the complications that might occur when myasthenic or cholinergic crisis occur in myasthenia gravis but the treatments are different.

Therefore, the question "How should the anesthesiologist manage the patient with MG presented for thyroid surgery and minimize the postsurgical complications?" stays open. Sometimes when anesthesiologist has this kind of a patient with such unwanted facts for anesthesia and when some complications occur the team might have difficulties to determine what the exact reason for some complication is.

The aim of the report is to present two different anesthesia techniques in a myasthenia gravis patient, with previous tracheal resection who underwent thyroid surgery (on two occasions).

Case:
We present 65 years old female patient scheduled for left side thyroidectomy after inform consent was given. The patient was 160 cm height and her body weight was 75 kg and Mallampati class 1.

From the patient anamnesis which we could not confirmed with any documented fact (patient was an immigrant), we found out that the patient had myasthenia gravis for the past 15 years and after the thymectomy, patient was graded as asymptomatic, without therapy and only occasionally controlled. Twelve years ago the patient had devastating car accident with severe polytraumatic injuries: facial bones fractures, serial rib fractures, pulmonic contusions and tracheal injury. The patient was comatose and underwent several interventions for tracheal resection and rib fixation. She was mechanically ventilated for more than 20 days and had ICU stay for more than a month. After this accident, patient condition with her underlining disease was worsened and she started taking pyridostigmine regularly.

Preoperatively patient underwent several examinations: laboratory tests, electrocardiogram (EKG), ENT evaluation, Rtg. of the lung, pulmonary functional tests and neurological evaluation. EKG, laboratory tests and pulmonary functional tests were within the normal range. ENT evaluation confirmed possible intubation and no vocal cord paralyses or edema. Neurological examination and MRI confirmed Myasthenia gravis (Osserman I) and some preoperative additional therapy were prescribed (higher doses of pyridostigmine and corticosteroids).

On the day of the surgery, patient arrived in the operating theatre without any premedication. Standard monitoring was placed and induction of anesthesia was started. The patient was pre-oxygenated with the O2 and introduced in anesthesia with fentanyl 150 mcg and 120 mg propofol. When we confirmed that mask ventilation was sufficient, inspection was done with laryngoscope. On the inspection Cormack and Lehane grade I was confirmed and rocuronium 40 mg was given. After two minutes the first intubation attempt was done but unfortunately the patients was not intubated. Successful intubation was achieved from the third attempt, because there was subglottic stenosis. Due to the stenosis endotracheal tube size 6 was placed.

Anesthesia was maintained with sevoflurane 2-3 % and fentanyl. Left side thyroidectomy with isthmectomy was done. The perioperative period went uneventful and surgery finished after 90 minutes.

On the wakening, patient had sufficient spontaneous breathing with tidal volume of 500 ml and respiratory rate of 13 respirations per minute, she held the head for more than 15 sec, held raised hand more than 40 seconds and decision for extubation was done. Patient was extubated and her oxygen saturation was monitored.

Patient was painless and she was feeling well. After 15 minutes, patient complained for subjective feeling of suffocation, difficulty of swallowing and objectively discrete stridor was present. She started to hyperventilate and was using extra effort for breathing. We

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decided to reintubate the patient, 30 mg of propofol was administered and intubation was performed. We decided to transfer the patient to Intensive care unit (ICU). While waiting for the transfer, patient started breathing with sufficient volume and respiration rate.

She was transferred to the ICU on spontaneous breathing. Postoperative laboratory tests and Rtg. of the lung were normal. Neurology consultation was done. The neurologist prescribed corticosteroids. After 7 hours, decision for extubation was brought. After extubation the patient confirmed that she wasn't taking regularly the prescribed therapy (pyridostigmine) from the neurologist and further more that she has omitted the corticosteroids because of some facial edema. We explained to her why it is important to take the medication and the importance of the neurologic preparation, as well as the risks at what she is exposing her without serious approach.

After 6 weeks the same patient was presented for total thyroidectomy because thyroid carcinoma was confirmed. Four weeks before the surgery, another neurologist and additional psychiatric evaluation was done. Neurologic therapy was remodeled and additional azathioprine was introduced.

Anyway, this time we decided to change the anesthetic management. We decided to go with total intravenous anesthesia with remifentanil and propofol. This time the intervention was finished after 60 min and the patient was extubated 40 min after the last skin stich in the operating theatre. She was discharged from the post anesthesia care unit after 2 hours.

Discussion

Myasthenia gravis is a specific disease and anesthesia reconsideration should be done on several levels. Airway management and intubation in myasthenia patients who had tracheal resection and presented for thyroid surgery might be devastating. In the everyday anesthetic practice when difficult intubation is anticipated, depolarizing neuromuscular agent succinylcholin is a gold standard. Acute intubating with succinylcholine in myasthenia gravis is possible (even thought higher doses are needed), but is not recommended [2,8,9].

Sungur et al., [10] report that rocuronium is safe for intubation of patient with myasthenia who undergo thymectomy. Authors like Gritti P et al. [11], consider that small doses of any non-depolarized neuromuscular relaxant (NDMR) for intubation do not alert the myasthenia gravis state at all, but the tube placement might be a matter of question. Some authors suggest that myasthenia patient can be given NDMR for intubation and if intubation is not possible suggamadex should be given [10].

Considering the previous literature facts, we have decided to start the induction of anesthesia with fentanyl and propofol, to see whether ventilation is possible and if the ventilation is possible and sufficient, to give NDMR- rocuronium. Intubation and surgery went uneventful and when the criteria for extubation were fulfilled, patient was extubated. But, after 20 -30 min the patient was reintubated.

Reintubation after thyroid gland surgery and in myasthenia gravis patients is not a rare situation. Some authors think that myasthenia patient when rocuronium is given have unpredictable response to NDMR and therefore reintubation and prolonged mechanical ventilation is reasonable [12]. This could be the possible reason for the reintubation that was exacted in our patient. The patient maybe had unpredicted response to NDMR because of the rocuronium given at induction.

In our earlier study that was done at 35 patients with MG presented for thymectomy, in which roccuronium was given for intubation, only one patient needed postoperative mechanical ventilation for 24 hours [13]. This patient who needed prolonged mechanical ventilation was classified as Osserman grade IIb, which means that not only bulbar musculature is affected but the generalized muscle weakness is present. This wasn't the case with the present patient who had only Osserman grade I, so why reintubation was needed, was still a matter of question. At that point we might have given reversal agent for the NDMR but according to literature this is also controversial. With reversal agents, we could have sent the patient to unwanted cholinergic crisis which was not favorable [2], so we decided to refrain from these agents.

We consulted neurologist to see what the possible reason for the reintubation was. At that time we thought that the patient might need controlled mechanical ventilation, but on our surprise after reintubation, patient was feeling well, satisfied and had sufficient spontaneous breathing.

Some author discuss that the preoperative therapy is crucial for early extubation in myasthenia patient [3]. Considering the previous observations and the fact that this patient didn't take her regular therapy this might be truth. But still the question was why only airway was a problem, not ventilation.

Several answers interfere. When we reviewed, that the patient was saying that has a feeling of suffocation in the throat and that she started to have discrete stridor, we figure out that reintubation and the need for airway management with endotracheal tube was due to other factors not due to myasthenia or NDMR.

Literature is decisive that most of the postoperative complications in thyroid surgery are due to tracheomalacia, edema of the vocal cords, edema of the surrounding tissues or lesion of recurrent nerve or laringectal nerve [5,7]. All of these factors except the total lesion of the recurrent nerve are self limiting and with anti-edematous therapy can be treated. If we recall back, after the intubation, the patient was speaking with sufficient voice so recurrent nerve lesion was extracted as a cause for reintubation. No hypocalcaemia was detected, so possible causes that are left were edema of the vocal cords (patient was intubated after the third attempt) as well as the edema of the surrounding tissue. Some authors reveal that these two reasons are the leading cause for reintubation in patients after thyroid surgery [7].

For the second intervention we had neurologist on the site, who confirmed that the patient took the morning dose of pyridostigmin and prescribed peroperative corticosteroids. Even though, we decide to go without NDMR, so we introduced the patient with remifentanil and propofol. Intubation was with tube size 6 and done on the first attempt. The surgery and extubation went uneventful. Patient was extubated in the operating theater and after two hours was send to the ward. Postoperatively no complications occurred.

Here we present two anesthesia scenarios and complications of a patient with myasthenia undergoing thyroid surgery. In the first scenario many parts of the puzzle were misplaced so the complication (reintubation) was a matter of question due to which part of the puzzle occurred. What we have learned from this patient and situation is that anesthesiologist and the surgical team can easily be mislead to see the big picture for unwanted complications when are focused on some disease. Even more we think that reintubation was not as a result of one isolated factor but was due to combination of several factors: myasthenia, not taking therapy, several attempts for intubation, postoperative surrounding tissue edema. Additionally anesthesia without any muscle relaxants may be desirable for easy clearing the puzzle.

Conclusion: Myasthenia gravis is a high risk disease and its course is unpredictable. Severe life treating condition might occur especially due to general anesthesia and endotracheal intubation. On the one hand it is important to be aware of this complications and their

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interdisciplinary diagnostic and therapeutic management. Additionally, preoperative treatment, honesty of the patient and the adequate documentation have to be considered to have lowest number of unwanted complications.

References:

1. Fambrough DM, Drachman DB, Satyamurti S. Neuromuscular junction in myasthenia gravis: Decreased acetylcholine receptors. Science 1973;182:293-295.
2. Krucylak PE,Naumheim KS. Preoperative preparation and anesthetic management of matients with myasthenia gravis. Semin Thorac Cardiovasc Surg.1999; 11:47-53
3. Kondov G, Trajkovska T, Ljapcev R, Gogova L, Kondova I. Thymectomy in Myasthenia Gravis: Response and Complications. Turkish Respiratory Journal 2005 ; 6:15-18.
4. Amathieu R., Smail N, Catineau J, Poloujadoff MP, Samii K, Adnet F.Difficult intubation in thyroid surgery: myth or reality? Anesth Analg. 2006 Oct;103(4):965-8
5. Sukhminder JSB.,Sehgal V.Anesthesia and thyroid surgery: The never ending challenges. Indian J Endocrinol Metab. 2013 Mar-Apr; 17(2): 228–234.
6. M.Abel and J.B.Eisenkraft. Anesthetic implication of myasthenia gravis. Mount Sinai journal of medicine 2002;69(1-2):31-37.
7. Malhotra S, Sodhi V. Anaesthesia for thyroid and parathyroid surgery. Continuing Education in Anaesthesia. Crit Care Pain. 2007;7:55–8.
8. Wainwright AP, Broderick PM. Suxamethonium in myasthenia gravis. Anesthesia 1987; 42:950-957.
9. Abel M., Eisenkraft JB and Patel N. Response to suxamethonium in a myasthenic patient during remission. Anesthesia1991;46:30-32.
10. Sungur UZ, Yavru A, Camci E, Ozkan B, Toker A.,Senturk M. Rocuronium and sugammadex in patients with myasthenia gravis undergoing thymectomy. Acta Anaesthesiol Scand. 2013 Jul;57(6):745-8. doi: 10.1111/aas.12123. Epub 2013
11. Gritti P, Sgarzi M, Carrara B, et al. A standardized protocol for the perioperative management of myasthenia gravis patients. Experience with 110 patients. Acta Anaesthesiol Scand 2012; 56:66.
12. Watanabe A, Watanabe T, Obama T, et al. Prognostic factors for myasthenic crisis after transsternal thymectomy in patients with myasthenia gravis. J Thorac Cardiovasc Surg 2004; 127:868.
13. M. Jovanovski-Srceva, A. Kokareva, B. Kuzmanovska et al. Retrospective analysis of anesthesia profile in patients with myasthenia gravis. Abstr. VI Congress of Neurologists of R. Macedonia with international participation&II International Ohrid Meeting Ohrid, 21-24 of September, 2016.