Total thyroidectomy for giant goiter under local anesthesia and Ketamine in a surgical mission

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ARTICLE INFO

Article history:
Received 24 August 2014
Received in revised form 31 December 2014
Accepted 3 January 2015
Available online 13 January 2015

Keywords:
Total thyroidectomy
Difficult airway
Surgical mission
Ketamine
Unable to intubate

ABSTRACT

BACKGROUND: Operation Giving Back (OGB) of the American College of Surgeons (ACS) and various other surgical missions in the developing world have become more popular and provide a valuable way of reducing the surgical burden worldwide. While most cases are "bread and butter" general surgery, difficult surgeries are often encountered.

MATERIALS AND METHODS: Description of a total thyroidectomy for super giant goiter extending to chest inferiorly, lateral neck and behind both ears, compressing the trachea and causing chronic difficulties breathing. The surgical team was unable to intubate, but performed surgery under local anesthesia and sedation with Ketamine injection.

RESULTS: Total thyroidectomy, as a life-saving procedure, was performed under local anesthesia and Ketamine with mild sedation. Once thyroid was removed, the outside diameter of trachea was assessed to be 4 mm. Patient tolerated the procedure well and had no postoperative complication. Her breathing improved significantly post-operatively. Five years later, she is doing well.

CONCLUSION: Total thyroidectomy for giant goiters can be done under local anesthesia with Ketamine and proper sedation. Surgeons and anesthesiologists participating in surgical missions may have to perform major surgery under local anesthesia.

1. Background

Surgical care is insufficient or nonexistent in many regions of the world. The lack of access to surgical care accounts for a high number of disability-adjusted life years (DALYs), defined as years of healthy life lost [2]. WHO estimates that 2 billion people have no access to basic surgical care and that surgery could be used to cure 11% of the global burden of disease [3].

Surgical humanitarian missions, including those outreach efforts arranged through the American College of Surgeons Operation (ACS) Giving Back OGB have become a viable method of providing surgical care to patients in underserved areas. Many other organizations around the world provide such missions as well, which typically involve a broad spectrum of surgical disciplines. While these missions are most rewarding for all surgeons, anesthesia and nursing teams, and highly effective method of reducing surgical burden worldwide [4], they can be fraught with surprises and possible complications that often cannot be predicted nor prevented.

Preoperative evaluation of surgical mission patients is a complex, time-consuming, and often it is performed inadequately. Typically, these evaluations require intense work by the operating team on the day of arrival at the mission site. Many of these patients wait for years to obtain surgical care only to be told they are inappropriate candidates for the surgical care that will be provided through the mission. Furthermore, despite all the best intentions of the teams to avoid "surprises" in these missions, unwanted situations occur, and things get complicated despite proper preparations.

Beginning in 2006, a surgical mission organized by the members of the ACS volunteers [5] and their teams have performed hundreds of operations including thyroidectomies, hysterec- tomies/oophorectomies, cleft lip and palate repairs, hernia repairs, superficial tumor removals, breast operations (from lumpectomies to mastectomies), cholecystectomies, and other procedures. It is not uncommon, however, that new patients arrive in the middle of the mission, without any prior preparations, oftentimes with the most complicated problems, or typically with neglected disease. In one of these recent trips to Tagbilaran, Bohol Islands, in the Philippines, the surgical team was asked to see a patient who had...
significant difficulties breathing due to a super giant goiter. The evaluation revealed a massive goiter [6] (Fig. 1). She was unable to move her neck freely and spoke with short sentences. The aim of this paper is to describe the technique used to deal with giant goiters in a patient unable to intubate performed under local anesthesia supplemented with intravenous Ketamine.

2. Case presentation

A 51 year old female with super giant goiter extending to mid chest inferiorly, lateral neck and behind both ears, and having chronic difficulty breathing was evaluated in the middle of the mission (Tuesday afternoon) by the surgical mission team in Tagbilaran, Bohol Island, Philippines. Because she had a giant goiter and was having difficulties breathing even during the interview with the authors of this paper, the decision was made to establish her as the second case of the day on the next day of the mission. We performed basic laboratory work, including complete blood count, PT/PTT and cross and match for blood type. In addition, we asked for two units of blood that is donated usually by the family members. No radiology, or biopsy studies were done. Our preference would have been to obtain a CT scan of the neck and upper chest; however, most of these patients cannot afford such expenses and the nature of urgency of the case really did no allow us the luxury to wait for more studies. The anesthesia team evaluated her and agreed on the plan of action. However, once on the operating table, all attempts to intubate by the very experienced anesthesia team including two attending and senior residents failed.

The senior author of this paper (RL) made a decision to proceed with the operation as a life-saving procedures and perform it under local anesthesia and Ketamine and light sedation, together with the anesthesia team (JH).

The anesthesia team had pre-treated the patient with an anti-sialogogue, glycopyrrolate, 0.6 mg intravenous push 15 min prior to airway management. After failed intubation attempts and the decision to proceed with surgery under local anesthesia, we maximized patient’s inspired FIO2 via supplemental O2 and then slowly titrated in Midazolam, 0.5–1.0 mg IV q 3–5 min, up to 2.0 mg total, prior to incision. Our concern was to not lose the airway due to over-sedation. After patient was mildly sedated with midazolam, we began titrating in the ketamine, 10–20 mg q 10 min, intravenous push as needed. The main goal is not to over-sedate and loose patient’s airway, but to keep her mildly sedated, breathing spontaneously and as cooperative as possible.

3. Operation

Classical thyroidectomy was performed. A large neck incision approximately 14 cm was required, however. Massive subcutaneous veins (Fig. 2) made the operation quite bloody. In sequence, the right lobe first and then the left lobe were removed. What made this operation more difficult, was not only the sheer size of the mass, but the expansion of the thyroid tissue from behind the ear, especially on the right side and over the trapezius muscle. The massive goiter had displaced the vascular poles greatly laterally and careful dissection was done to identify them and ligate. This was done using both finger blunt technique dissection and by pulling the thyroid tissue medially and sharp dissection. Both parathyroid glands were identified and preserved superiorly, but none of the parathyroid was seen inferiorly. Patient calcium level remained normal post operatively. Due to the size of the goiter, and the fact that patient was talking throughout the case with local nurses in her language, neither of the recurrent laryngeal nerves were sought or found. The operation was completed in less than 1 h. Postoperatively, the patient did very well, and in the morning she did not remember any of the moments of the surgery. Surprisingly, she did not have any problem with tracheomalacia, despite her trachea being 4 mm in outside diameter. However, she wondered why her incision was longer than the incision of other women who seemingly underwent the same operation, which although majority were “giant” they were not as large as this case (Fig. 3).
4. Discussion

Hundreds of surgeons, anesthesiologists, and nurses from different surgical specialties from around the world perform various surgical procedures as volunteers especially in developing countries. While, most of these operations are “bread and butter” surgical procedures, it is not uncommon to have operations for neglected large hernias, goiters and thyroid cancer, hysterec- tomies (for massive fibroid tumors or even cancer), mastectomies oophoro–salpingectomies, various plastic surgery reconstruction with cleft palate in adults, and other not so “bread and butter” surgical procedures.

We present a case that was impossible to intubate due to the narrowing of the trachea. The decision to operate under local anesthesia with sedation was the most difficult one that this surgeon (RL – senior author) had to make in his career. What made him decide to attempt to perform this life saving operation was a silent crying of the patient, when everyone gave up, manifested by a huge teardrop as she looked hopelessly at the surgeon and the rest of the team. She had collaborated with every request of the anesthesia team. Awake intubation. Sedated. Lost her airway temporarily. All of this so she can have the massive monster mass removed in order to breathe, and to look normal. Nothing else could be done. She would have died die soon due to suffocation from this mass on her neck.

Local and regional anesthesia for thyroidectomy has become common practice and has been reported by a number of authors [7–9]. However, our extensive review of the literature found no report of giant goiter operated under local anesthesia, and to our knowledge this is first case reported that was done in a surgical mission.

5. Conclusion

Regional anesthesia is a safe alternative to general anesthesia for patients undergoing thyroid surgery [7]. Surgeons and anesthesiologists participating in surgical missions may have to perform major surgery under local anesthesia. Total thyroidectomy for super giant goiter can be done under local anesthesia with proper sedation. It is necessary for surgeons participating in general surgery volunteer missions to be familiar with the effect of Ketamine, its use, and how to manage difficult cases such as the one presented in this paper. The proper response to these difficult cases is worthy of the reward.

Conflicts of interest

No conflict of interest.

Funding

None.

Consent

We have a consent form the patient.

Author contribution

Dr. Latifi, performed the operation, wrote the manuscript and is responsible for the information presented.

Dr. Harper, reviewed critically the manuscript and performed the anesthesia.

Dr. Rivera, reviewed critically the manuscript.

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