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Case report

Diagnosis of bilateral cord vocal paralysis by the Airtraq laryngoscope: A case report

Mustapha Bensghir [a,*], Bouchaib Hemmaoui [b], Abdelhafid Houba [a], Charki Haimeur [a], Nordine Drissi Kamili [a], Hicham Azendour [a]

[a] *Service of Anesthesiology Military Hospital Med V Rabat, University Med V Souissi Rabat Maroc, Morocco*
[b] *Service of ENT Surgery Military Hospital Med V Rabat, University Med V Souissi Rabat Maroc, Morocco*

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Abstract The thyroid disease is still common in our country. Divers complications have been described in this type of surgery. Paralysis of the vocal cords and particularly bilateral paralysis are exceptional. The diagnosis is made by examen of the vocal cords before extubation. The standard laryngoscope is the most device commonly used for this indication. The interest of the new devices is not clear. We report the use of the Airtraq laryngoscope for the diagnosis of bilateral vocal cord paralysis after a thyroidectomy under general anesthesia. Through this case and review of the literature, we discuss the interest of the new devices in the diagnosis of this complication and the means of its prevention.

1. Introduction

The thyroid disease is still common in our country due to iodine deficiency [1,2]. It often requires surgical treatment. In this surgery various complications have been described [3]. Bilateral cord paralysis represents a serious complication. Examen of the vocal cords by standard Macintosh laryngoscopy before extubation can detect this complication. Other devices may be used in this indication [4-6]. We report the use of the Airtraq laryngoscope for the diagnosis of bilateral vocal cord paralysis after total thyroidectomy. Informed consent was signed by the patient.

* Corresponding author. Address: Mustapha Bensghir, Post Box 8840, Rabat, Agdal Rabat, Morocco. Tel.: +212 661 30 15 77.
E-mail address: mustaphabens_15rea@hotmail.com (M. Bensghir).

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2. Case report

A 58-year-old 69 kg, 168 cm woman with a history of hypertension stabilized with amlodipine, was scheduled for total thyroidectomy. Preoperative assessment noted a normal voice, calm breathing, arterial oxygen saturation to 98%, a blood pressure to 145/78 mmHg and a heart rate of 83 beats/min. The ultrasonography thyroid showed multiple nodules dotting the entire thyroid gland. Chest X-ray noted no signs of tracheal compression or deviation. Electrocardiogram showed a regular sinusal rhythm. Laboratory tests were normal, especially thyroid hormones.

After a premedication (hydroxyzine 75 mg), the patient was admitted to the operating room where a monitoring including heart rate (HR), non-invasive blood pressure (NIBP) and arterial oxygen saturation (SPO2) was installed. The venous access was secured and general anesthesia was induced with fentanyl (2.5 μg/kg), thiopental (3 mg/kg) and cisatracurium (0.15 mg/

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kg) administered after effective facial mask ventilation. Direct laryngoscopy by Macintosh laryngoscope with metallic blade number 3 showed a grade I of modified Cormack and Lehane score. The trachea was intubated in the first attempt by a reinforced tube size 7 mm without stylet. Anesthesia was maintained with isoflurane 1% and nitrous oxide (50%:50%). During the procedure, which lasted 110 min, no incidents have been noted. The respiratory and cardiac parameters have remained stable. For postoperative analgesia, dexamethasone 8 mg was administered just after induction and 1 g of paracetamol and 20 mg of nefopam were administered before the end of the surgery.

The patient was transferred to recovery room where an extubation was performed after full recovery. Shortly after extubation she presented a laryngeal dyspnea with stridor. The saturation was 98% under oxygen (3 l/min), the NIBP was 141/67 mmHg and HR was 99 beats/min. Exam of the neck noted any signs of bleeding or hematoma compression. Exam of oral cavity finds no foreign bodies. There was no wheezing in pulmonary auscultation. The diagnosis of laryngeal edema or residual paralysis was suspected. An antagonism by prostigmine and atropine with an injection of corticosteroids (methylprednisolone 80 mg) were decided. Simultaneously a nebulization with adrenalin (1 mg and 3 ml of saline solution) was started. After 30 min no clinical improvement was noted. So, we decided to explore the vocal cords.

After reassuring and clearly explain the procedure to the patient, the standard Macintosh laryngoscope was gently introduced. Imperfect cooperation of the patient and nausea limited the progression of the laryngoscope and had required its removal. After, the use of Airtraq laryngoscope (ATL) was decided. Ten minutes later, the ATL (Prodol Meditec SA, Vizcaya, Spain) was introduced. Glottic visualization noted a much reduced mobility of vocal cords in adduction position. Cooperation of the patient and tolerance of the procedure were considered acceptable. The laryngeal fiberoptic evaluation, by ENT surgeon, confirmed the diagnosis of cord vocal paralysis (Fig. 1). The patient was reintubated with a reinforced tube of 6 mm and transferred to ICU. Corticosteroids were continued (methylpednisolone 80 mg/8H). During the first 48 h, no clinical or endoscopic improvements of the mobility of the vocal cords were noted. Tracheostomy was made and the patient was transferred to ENT department for specific treatment and following. A control nasofibroscopy, after tracheotomy, had been showed a posterior cleft, a slight mobility of vocal cords and fixed arytenoids. Endoscopic control during follow-up the patient had recovered slowly mobility of vocal cords authorizing decannulation and discontinuation of corticosteroids in the third week. During subsequent follow-up, dysphonia without swallowing disorder was noted.

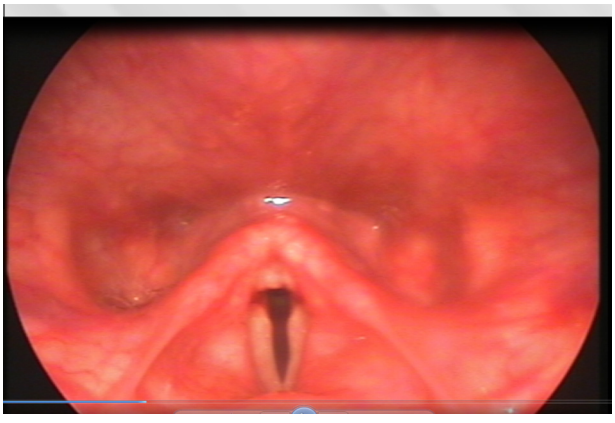

Figure 1 Image showing vocal cord in adduction position.

3. Discussion

Recurrent laryngeal nerve paralysis during thyroid surgery was an iatrogenic dreaded complication by surgeon and unexpected by patient. The incidence of this complication varies from 0.2% to 13.2% [7-9]. This variation is due to the wide variation in type of recruiting by surgical centers (goiter, nodule, cancer, etc). Repeat thyroid surgery, suspected malignancies and goiter are the surgeries of increased risk of recurrent laryngeal nerve paralysis [7,10]. Chronic nerve compression by a large goiter or extra-thyroidal tumor extension may also cause nerve damage even before intervention. Outside of exploration, these lesions remain undetectable and many patients are asymptomatic with a unilateral cord paralysis [11]. This raises the question of a preoperative exam of the vocal cords. This assessment is not standardized and varies among centers. However, for patients and the risk surgery, knowledge of the status of the vocal cords before surgery is crucial for the choice of surgical technique, means of prevention, patient information and medico legal reasons [8,10,12]. In anesthetic consultation, our patient was asymptomatic. Exploration of the vocal cords before surgery was not performed.

During thyroid surgery, nerve damage can be explained by different mechanisms: sharp dissection, retraction stretching.... For the prevention of these injuries, visual identification of recurrent laryngeal nerves by surgeons remains the gold standard. The superiority of intraoperative monitoring in relation to visual identification is controversial [13,14]. As against the use of this monitoring should be discussed in patients with a risk of recurrent laryngeal nerve paralysis [15,16]. For prevention, apart from identification preoperative asymptomatic paralysis, visual identification of recurrent laryngeal nerves and selective use of intraoperative monitoring, effect temporary reduction in laryngeal nerves paralysis was noted with intraoperative administration of dexamethasone [17]. Traumatic intubation may also be a cause of cords vocal paralysis [18]. In our patient, intubation was easy and made in the first attempt. Very probably, the paralysis observed in our case, was related to nerve damage caused by surgery.

Before extubation, the practice of laryngoscopy can detect any laryngeal lesion by analyzing the mobility of the vocal codes. This exploration is not practiced in all centers. Mobile vocal cords allow extubation without incident. This mobility should be interpreted taking into account the residual effects of anesthetic agents. In our patient, residual paralysis was suspected. An antagonist was made by prostigmine. By cons there were no clinical signs of residual opioids. For this exploration, standard Macintosh laryngoscope is the device most used. But this technique requires more force on the mandible and offers less visibility of the vocal cords. Following thyroid surgery, in a prospective study, comparing the standard Macintosh laryngoscope and fiberoptic endoscope of assessment accuracy of postoperative vocal cord mobility, the authors showed that fiberoptic endoscope allows better visualization of vocal cords than the standard laryngoscope with greater comfort and less stress for the

patient [6]. In another prospective study, comparing exploration of vocal cords by three methods (direct laryngoscopy, indirect laryngoscopy and flexible laryngoscopy), the authors noted that the flexible laryngoscopy is the best method of exploration of the vocal cords after thyroid surgery with a better hemodynamic response [5]. Similarly, the glottic view was better with the Glidescope compared to standard laryngoscope [4].

The Airtraq laryngoscope is a new device, which has proved effective in the management of difficult intubations [19]. This device allows an optimal glottic view without the alignment of the three axes and need less force on mandible with better hemodynamic response to intubation. The comfort of this device allowed its use effectively in awake tracheal intubation and intubation under local anesthesia [20,21]. Moreover, the better visualization offered by the Airtraq laryngoscope has authorized an enlargement of its use outside of intubation [22,23].

In postoperative thyroid surgery, exploration of the vocal cords with a standard laryngoscopy is often difficult and incomplete. The cooperation of the patient is imperfect with a nausea limiting the full exploration. Similarly, this laryngoscopy causes significant stress for the patient and a major hemodynamic response. This hemodynamic response can have serious consequences in patients with cardiovascular risk. Of this exploration, use of ATL could be an alternative to standard laryngoscopy allowing having a good view and better hemodynamic responses. In our patient, the use of ATL, after the failure of standard laryngoscopy, contributed to the diagnosis of vocal cord paralysis with better comfort and acceptable hemodynamic response.

4. Conclusion

In thyroid surgery, all means must beings used to avoid recurrent laryngeal nerve paralysis and especially bilateral paralysis. The optimal management of this complication is early diagnosis. For this diagnosis, the Airtraq Laryngoscope could be a good alternative to standard laryngoscope.

Conflict of Interest

We have no conflict of interest to declare.

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