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Patient-Assisted Self-Introduction of Airtraq® in a Difficult Airway Case

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Abstract

A 40-year-old male patient diagnosed with metastatic adenoid cystic carcinoma of the nostril, scheduled for embolization of an aneurysm of the left internal carotid artery (intracavernous segment). In the pre-anesthetic assessment, the patient had previous head and neck radiation, limited oral opening <1.5 cm, facial paralysis and previous maxilloethmoidectomy with ocular exenteration and reconstruction with an anterolateral paratracheal ALT flap stood out. Under appropriate topical anesthesia and sedation, intubation was made in an awake patient with an Airtraq® videolaryngoscope. In this case, it was the patient who performed the self-introduction of the videolaryngoscope to his maximum tolerance, achieving intubation, without a gag or cough reflex, bleeding associated with airway manipulation and with adequate patient satisfaction.

Keywords: Airway management; Airtraq; Videolaryngoscope; Awake intubation; Difficult airway; Self-intubation; Adenoid cystic carcinoma

Introduction

Patients with head and neck cancer are characterized by a high probability of encountering a Difficult Airway (DA). Up to 39% have problems associated with the airway and up to 70% have associated obstructive lesions in the airway [1]. They have often undergone radiotherapy, oropharyngeal surgeries, tracheostomies and some have difficulty in cervical flexion-extension or tumors that make oral opening complex, becoming a challenge for the anesthesiologist. In cases of anticipated (DA), we have fibrobronchoscope or videolaryngoscopes. The fibrobronchoscope was first described to assist Orotracheal Intubation (OTI) in 1967, becoming the gold standard for awake intubation. However, with the development of new generations of videolaryngoscopes in the 2000s, high success rates have been achieved, reducing the number of failed attempts and the incidence of trauma in the airway [2]. In addition, they allow a steep learning curve, ease of training for personnel in training, operator ergonomics [2] and easy change of tube number in cases of subglottic stenosis. Likewise, videolaryngoscopes are of great value in places where access to fibrobronchoscope is more limited, such as anesthesia outside the operating room or with poorly trained personnel. For all these reasons, videolaryngoscopes are currently frequently used devices and are even used by many anesthesiologists as a first-line device in cases of anticipated difficult airway [3]. There is little consensus on the ideal sedation regimen during awake intubation. The DAS (Difficult Airway Society) guidelines describe the benefit of minimal sedation, although they also report that it can be performed safely and effectively without it, although it can become unpleasant, trigger coughing, nausea, vomiting and even oropharyngeal injuries [4]. A case of planned difficult airway is presented in which the patient self-inserts an Airtraq® videolaryngoscope under local anesthesia and sedation without nausea, vomiting or cough, without any other complications, and adequate tolerance.

Case Presentation

A 40-year-old male patient, 54 kg and 170 cm tall (BMI 19.58 kg/m^2) ASA IV, scheduled for embolization of an aneurysm of the intracavernous segment of the left Internal Carotid Artery (ICA) (Figure 1, 2). As background, he presented a diagnosis of metastatic adenoid cystic carcinoma in the left nostril, initially treated with maxilloethmoidectomy with ocular exenteration and reconstruction with an anterolateral paratracheal flap that required tracheostomy with posterior closure, subjected to radiotherapy and chemotherapy, subsequently presenting a relapse with pulmonary, bone, cerebellopontine angle and subcutaneous tissue in the region of the previous tracheostomy metastases. Admission due to suspicion of acute meningoencephalitis due to contiguity in relation to infection of the flap/surgical area of the previously performed maxillectomy. An aneurysm in the cavernous segment of the left ICA was incidentally diagnosed in the extension study, confirmed

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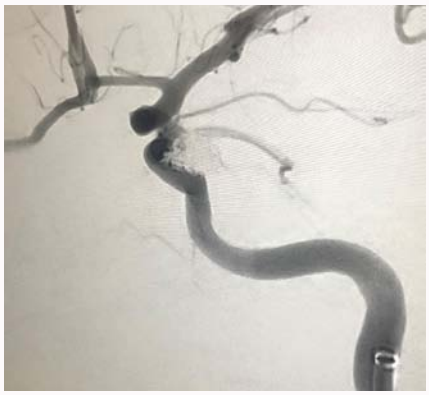

Figure 1: Exclusion of aneurysm of the intracavernous segment of the left internal carotid artery with coils.

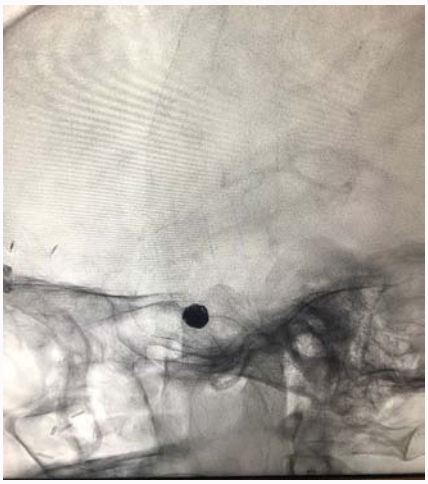

Figure 2: Aneurysm of the intracavernous segment of the internal carotid artery embolized with coils.

by diagnostic angiography under sedation. It was then decided to perform scheduled embolization of the aneurysm with coils.

In the preoperative evaluation, he presented a history of radiation in the head and neck region with a physical examination that showed trismus with limited oral opening of 1.5 cm, thyromental distance of >6 cm, class II mandibular protrusion with adequate cervical flexion and extension, with flap in previous tracheostomy region in adequate conditions. Laboratory tests revealed chronic anemia and lymphopenia with correct coagulation and renal function. Upon his arrival in the angioradiology room, the patient was hemodynamically stable, eupneic with oxygen saturation of 98% on room air. After obtaining consent for the planned intubation technique, it was explained to him that he would control the insertion of the device (airtraq®) and it could be terminated at any time if he was uncomfortable. Standard monitoring was performed and oxygen was administered at 2 L/min through nasal cannula. 5 ml of nebulized 2% lidocaine were used followed by topical anesthesia with 10% lidocaine spray on the oropharynx. Sedation was started with Remifentanil at 0.07 mcg/kg/min and midazolam 2 mg. Next, with the head of the stretcher at 30º and under spontaneous breathing, the patient was asked to self-introduce the Airtraq® size 2 devices with a 7.5 mm diameter endotracheal tube according to his tolerance (Figure 3). Once the self-introduction of the Airtraq® reached the maximum possible

Figure 3: Self-introduction of Airtraq by the patient.

Video 1: Patient who performs the complete self-introduction of the Airtraq under sedation for subsequent intubation, by the anesthesiology team.

tolerance for the patient, the anesthesiologist proceeded to visualize it through the videolaryngoscope. At that time, the visualization of the glottis was partial, so its placement was optimized, after which, and under complete visualization of the glottis, the tube was introduced, which passed the vocal cords, followed by a stop due to subglottic stenosis, for which a second attempt was made with a 6 mm tube with no difficulties in advancing it. The tube change was done quickly due to the ease of assembly of the Airtraq® (Video 1). Once the tube was inserted, induction was carried out with propofol, fentanyl, and rocuronium. The procedure was well tolerated by the patient. Maintenance was performed with Propofol TIVA and remifentanil. The intervention was uneventful. At the end, the muscle relaxant was reversed with sugammadex and the patient was extubated in the angioradiology room without complications. He was transferred to the semi-critical unit for postoperative control.

Discussion

Intubation in patients with expected difficult airway is a challenge for Anesthesiologists. The fibrobronchoscope is the device traditionally used for intubation in the awake patient and is considered the reference device.

However, its learning curve is long, requiring intense training and enough experience for its proper use. In addition, it is a device that is not always easily available, especially in those cases in which intubation is required outside the operating room. In recent years, the Airtraq® has emerged as an alternative to the fibrobronchoscope for awake intubation in cases of difficult airway. Several studies have published that it is easier to manage the Airtraq® compared to the fibrobronchoscope in intubation with the patient awake in cases of difficult airway. In addition, learning for its proper use is fast and is easily available in areas outside the operating room. On the other hand, the use of Airtraq® requires a refined technique that allows the

procedure to be the least uncomfortable for the patient. For this, different sedation techniques and local anesthetics are used to achieve optimal conditions for intubation with the patient awake. However, on many occasions' intubation can become uncomfortable [4]. In a series of 50 morbidly obese patients who underwent awake intubation with videolaryngoscope after topical anesthesia and sedation, almost 50% failed on the first attempt due to gag reflex and cough [5]. Other studies report intubation failure rates of up to 10% due to inadequate suppression of airway reflexes or discomfort [4]. In this regard, self-introduction of Airtraq by the patient can reduce discomfort, reducing the presence of nausea, vomiting or cough [6]. This would be due to the fact that by having the patient control over the videolaryngoscope, they can also control the tolerance they have when inserting it. In our case, self-introduction of Airtraq by the patient occurred without complications and was very well tolerated. In addition, taking into account the characteristics of the patient with a locally advanced neoplastic process of the face and neck and limited mouth opening, self-introduction constituted a safety element and made it possible to reduce patient anxiety regarding intubation, improving comfort. One limitation of its use is that it can only be used in selected patients who want to collaborate in its performance. In addition, it is necessary to properly explain the technique so that the patient can help effectively. Although sedation during awake intubation using fibrobronchoscope or videolaryngoscope is associated with high levels of patient satisfaction [7], the risk of over sedation could be particularly dangerous in patients with difficult airway, including respiratory depression, hypoxia, aspiration, and hemodynamic instability [1,8]. In those cases where the use of sedation could be controversial, the self-introduction of Airtraq would be an advantage as an option to increase patient safety because it would require a lower level of sedation. On the other hand, it requires greater optimization of the sedation level to avoid overdosing that prevents this collaboration. Since the self-introduction of Airtraq® is a novel technique, new studies are needed to establish the benefits of this technique with respect to traditional methods of intubation in awake patients with difficult airway. Another advantage of self-introduction would be related to the trauma associated with the airway due to its manipulation with videolaryngoscopes or fibrobronchoscope. Kramer et al. [9] published that minor nasopharyngeal bleeding occurred in 18% of cases with the use of a videolaryngoscope for intubation with the patient awake, while with a fiberoptic bronchoscope the bleeding rate was 24%. On the other hand, Rosenstock et al. [10] to the obtained values of 4.7% and 7% for the videolaryngoscope and the fibrobronchoscope, respectively. In this regard, the self-introduction of the videolaryngoscope could reduce bleeding by reducing the possibility of trauma due to the patient's control over the device. However, new studies would be needed to test this hypothesis.

Conclusion

Patient self-introduction of the videolaryngoscope is a tool that could be useful in cooperative patients, to increase comfort and reduce episodes of nausea, vomiting or coughing, prevent minor bleeding associated with trauma during the procedure and even reduce the level of sedation in patients that is required, making the patient participate in the procedure. However, new studies are needed to confirm this hypothesis.

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