***Review Article***

# Awake video laryngoscope guided intubation (VLI) in a case of advanced NasopharyngealCarcinoma


## Abstract

**Background:**Awake videolaryngoscopeguided intubation is a reliable approach for securing the airway in patients with predicted or unexpectedly difficult airway conditions. Awake video laryngoscope-guided intubation which was developed in the early 2000s can be applied successfully in a variety of clinical settings with better patient preparation and implementation of the proper approach.

**Case presentation:** On December 10, 2022, a 62-year-old male with advanced Nasopharyngeal Carcinoma with concomitant comorbidities resulting from earlier chemotherapy and radiotherapy underwent elective surgical tracheostomy. A fiber optic indirect laryngoscopy uncovered a narrow laryngeal inlet. A successful surgical tracheostomy was performed after a successful Awake videolaryngoscopeguided intubation using the C-Mack with a topical and injectable anesthetic. After awakening from anesthesia, the patient was moved to the ICU for routine observation. The patient recovered quickly and was discharged within a few days.

**Conclusion:** This case describes the successful management of an advanced Nasopharyngeal Carcinoma patient undergoing elective tracheostomy. The patient underwent Awake video laryngoscope guided intubation with the C-Mack, topical and injectable anesthetic, which

allowed for a successful surgical tracheostomy despite the concomitant comorbidities from past treatment.

**Keywords:** Awake video laryngoscope guided intubation,Nasopharyngeal Carcinoma,Tracheostomy,C-Mack.



## Introduction

A nasopharyngeal carcinoma is an epithelial carcinoma that develops from the lining of the nasopharynx (nasopharyngeal mucosa)(1). The pharyngeal recess, also known as the fossa of Rosenmüller, is a common location where tumors are found in the nasopharynx(2). Despite the fact that these tumors arise from the same tissue or cell lineages, nasopharyngeal carcinoma, and other epithelial neck and headtumors are completely different from one another(3). When compared to other forms of cancer, nasopharyngeal carcinoma is a very rare form of the disease(3). There were around 129 000 new cases of nasopharyngeal carcinoma in 2018, as reported by the International Agency for Research on Cancer(4, 5). This represents only 0.7 percent of all cancers that were identified in 2018(4, 5). However, the geographical global distribution of the disease is extremely uneven; more than seventy percent of new cases are found in east and southeast Asia, with an age-standardized rate (world) ranging from 3·0 per hundred thousand in China to 4.0 per hundred thousand in populations that are primarily white(6).

Additionally, the cause of nasopharyngeal carcinoma is believed to result from a combination of environmental exposure, genetics, and Epstein-Barr virus (EBV) infection(7). Environmental

factors such as smoking, heavy alcohol consumption, and nitrosamine exposure have been linked to an increased risk of NPC(8). Patients with NPC can present with a variety of symptoms, depending on the location of the growth. The most common symptoms of NPC include nasal symptoms such as nasal obstruction due to narrowing of the airways, epistaxis, post-nasal drip, hyponasal speech, or cacosmia, affecting 80% of patients(9).

In the past, awake fiberoptic intubation was the procedure most frequently suggested for addressing expected problematic airways(10). However, it is becoming increasingly obsolete and is presently used by only a small number of specialists. Recent research has demonstrated that awake video laryngoscope-guided intubation is preferable and should now be the method of choice when handling expected problematic airways(11, 12).

Currently, different types of video laryngoscopes have been developed. These include Storz, and McGarth, etc. Different researchers compared the efficacy of the GlideScope, McGrath, and Storz video laryngoscopes in managing the difficult airway, difficult laryngoscopy, and difficult tracheal intubation, as defined by the ASA(12, 13). These devices have been demonstrated to provide or improve the Cormack-Lehane view to grade 1 or 2 in a significant number of patients while maintaining a high intubation success rate(14, 15). Video laryngoscopes have also shown high retention of Cormack-Lehane grades 1 and 2 while ensuring successful intubation in patients with predicted difficult airways(16). They have been used effectively following failed direct laryngoscopy and proved to be effective rescue devices following failed fiberoptic intubation(17). Despite their effectiveness, video laryngoscopes are not recognized as commonly used methods in the ASA guidelines for managing difficult intubation.

Researchers suggest high efficiency of video laryngoscopes in patients with established predictors of prospective difficult intubation, as well as their rate of success as a lifesaving

device after failed intubation, can provide a chance for video laryngoscopes to have a greater impact as an alternate solution to difficult airway technique for awake intubation scenarios(18). This opportunity is made possible by the fact that video laryngoscopes have a high success rate in patients with known predictors of potentially difficult intubation.

Thus, it is crucial to include Awake videolaryngoscopeguided intubation as a consideration in comprehensive airway management.The case report presented offers a description of successful Awake videolaryngoscopeguided intubation in a patient with advanced Nasopharyngeal Carcinoma.

**Case presentation:**

A 62-year-old male with a known case of advanced Nasopharyngeal Carcinoma underwent an elective surgical tracheostomy on December 10, 2022. The patient had received chemotherapy and radiotherapy for the nasopharyngeal tumor, making intubation riskier (ASA III E). There was no associated significant history. On examinationthe patient's hypopharynx were observed to be severely congested, erythematous and edematous.A fiber optic indirect laryngoscopy by an ENT physician revealed a narrow inlet of the larynx.Doctors suspected that this swelling and inflammation caused stenosis of the laryngeal inlet and obscured the view of the vocal cords.

Later, Awake video laryngoscope guided intubation was planned with the use of the C-Mack after the application of a lidocaine spray and racemic lignocaine. On the day of surgery, the patient was connected to standard monitoring and pre-oxygenated. Topical anesthesia was applied to the patient's oropharynx with a 4% lidocaine spray, and 3 ml of 2% lidocaine was injected through the cricoid ligament intra-trachea.The C-Mack was used under an awake technique, and a gum elastic bougie was inserted through the vocal cords. A tracheal tube size 5

mm was railroaded on the bougie, confirmed by capnography wave and symmetric breathing sound by auscultation. General anesthetic drugs were administered after the tracheal tube was placed.The patient was also administered a combination of medications, along with racemic Lidocaine. These include Fentanyl 2 mcg/kg, Propofol 2mg/kg, and Cisatracurium0.1 mg/kg.

After a tracheostomy tube was inserted, the patient was extubated.Thesurgical tracheostomy was performed successfully. At the end of the surgery, emergence from anesthesia was achieved, and the patient was transferred to the ICU for routine observations.After that, the patient was successfully discharged.

**Discussion**

The case presented demonstrates the successful use of Awake videolaryngoscopeguided intubation in a patient with advanced Nasopharyngeal Carcinoma. A nasopharyngeal carcinoma is a form of head and neck cancer that can have serious consequences, especially when it comes to managing the airways(19). For example, the size and placement of the tumor can restrict the airway in such patients, making intubation difficult(20). Various airway intubation procedures have been developed recently to handle difficult cases with constricted airways. Awake videolaryngoscopeguided intubation is one such therapeutic approach(21).

Awake video laryngoscope-guided intubation is a preferred technique in cases of anticipated or unanticipated difficult airways such as narrowing of the larynx inlet, as it allows for real-time visualization of the airway and reduces the risk of airway trauma(11).This has also been suggested by other authors who showed that awake video laryngoscopy can be used successfully on patients with macroglossia for whom standard laryngoscopy and fiberoptic bronchoscopy failed(22). A large body of evidence suggests that AVL has been proven to be a viable option for

a patient with laryngeal edema and severely narrowed airways due to radiotherapy and neoplasm, individuals having facial deformity resulting from different cancer surgeries,obese patients, patients with previous difficult awake fiberoptic bronchoscope intubation with Cormack(23-25). In our case, the patient had also received chemotherapy and radiotherapy, which further complicated airway management. A fiber optic indirect laryngoscopy revealed a narrow inlet of the larynx, indicating the need for Awake video laryngoscope-guided intubation.

Another research showed that in the majority of patients documented, a Cormack-Lehane grade 1 was reached during effective intubation with the patient's full cooperation, steady oxygen saturation concentrations, and minimally reported discomfort(11). Jones and Harle employed a video laryngoscope to analyze the airways of patients who were anticipated to have challenging intubations prior to surgery(26). They believed intubation could be successful if the video laryngoscopic examination revealed a substantial section of the glottis while the patient remained awake. The examination indicated Cormack-Lehane grades 1 or 2, and all patients tolerated it without discomfort, with the exception of one who coughed, but lidocaine fixed the situation. Under general anesthesia, all patients had grade 1 Cormack-Lehane views with the video laryngoscope, resulting in successful ETT insertion. This technique provides a more sophisticated evaluation of the airway, consistent with the ASA's recommendation that an airway examination is performed prior to anesthesia administration and airway management(26).

Previous literature also supports the use of conventional management for a patient with challenging cases of narrow airways. These studies also recommend that when dealing with difficult airways, the emphasis should also be placed on proper extubation techniques(27). Patients should be pre-oxygenated with 100% oxygen, positioned upright, and allowed to resume spontaneous breathing before the tube is removed(28). Pain management using opioid-sparing

techniques, such as regional anesthesia, is preferred as high doses of opioids can lead to post-operative nausea, vomiting, respiratory impairment, and drowsiness. Both reduced consciousness and vomiting can pose a threat to the airway. In this case, the patient was pre-oxygenated, and topical and injectable anesthesia was applied to reduce discomfort during the procedure(28). The use of the C-Mack, a device that helps to manipulate the epiglottis and improve the view of the larynx, was crucial in ensuring successful intubation. The patient's airway was confirmed to be secure through capnography wave and auscultation, and the surgical tracheostomy was performed successfully.

**Conclusion**

In conclusion, the use of Awake videolaryngoscopeguided intubation in a patient with advanced Nasopharyngeal Carcinoma can be an effective and safe technique for airway management. Proper patient preparation, topical and injectable anesthesia, and the use of the C-Mack can improve the success of intubation and minimize the risk of airway trauma. This case highlights the importance of Awake video laryngoscope guided intubation in managing patients with challenging airways.

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