

# Can concurrent use of king vision video laryngoscope and fiberoptic bronchoscope improve efficacy and safety of awake intubation in patients with limited mouth opening? - A case report



Sunana Gupta<sup>1</sup>, Rahul Gupta<sup>2</sup>, Nandita Mehta<sup>3</sup>, Heena Saini<sup>4</sup>

<sup>1</sup>Additional Professor, Department of Anaesthesiology, All India Institute of Medical Sciences, <sup>2</sup>Associate Professor, Department of Urology, <sup>4</sup>Lecturer, Department of Anaesthesiology, Government Medical College, <sup>3</sup>Professor, Department of Anaesthesiology and Critical Care, Acharya Shri Chander College of Medical Sciences and Hospital Sidhra, Jammu, Jammu and Kashmir, India

Submission: 23-12-2023

Revision: 29-01-2024

Publication: 01-03-2024

## ABSTRACT

Securing the airway by endotracheal intubation in a patient with a restrictive mouth opening poses a challenge to anesthesiologists. Awake tracheal intubation using flexible fiberoptic bronchoscopy is the gold standard in the anesthetic management of patients with restricted mouth openings. Awake video laryngoscopy (VL) is being increasingly used for the management of the anticipated difficult airways. We report a case of temporomandibular joint ankylosis with restrictive mouth opening posted for laparoscopic nephrectomy managed by awake intubation with the combined use of king vision VL (KVVL) and fiberoptic bronchoscope (FOB). KVVL provided an improved and clear view of the airway structures and FOB helped in guiding and maneuvering the tube safely into the larynx. The combined use of KVVL and FOB enhanced the effectiveness and safety of the procedure.

**Key words:** Awake tracheal intubation; Restrictive mouth opening; King vision video laryngoscope; Fiberoptic bronchoscopy

### Access this article online

**Website:**

<http://nepjol.info/index.php/AJMS>

**DOI:** 10.3126/ajms.v15i3.61023

**E-ISSN:** 2091-0576

**P-ISSN:** 2467-9100

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## INTRODUCTION

Awake tracheal intubation is most commonly performed with flexible bronchoscopes, but there is an emerging role of video laryngoscopes (VLs) for the same.<sup>1</sup> Several researchers have demonstrated the potential advantages of awake VL assisted tracheal intubation and have recommended its implementation as the primary management strategy for anticipated difficult airway cases.<sup>2,3</sup>

Simultaneous use of VL with flexible bronchoscopes in awake intubation enables the synergistic utilization of the beneficial effects of both techniques, especially when difficulty is encountered with individual techniques.

Temporomandibular joint ankylosis (TMJ) results in the inability to open the mouth either partially or completely due to the presence of bony or fibrous tissue.<sup>4</sup> Anesthetic management in such patients necessitates a thorough pre-operative assessment of the airways and appropriate

### Address for Correspondence:

Dr. Heena Saini, Lecturer, Department of Anaesthesiology, Government Medical College, Jammu, Jammu and Kashmir, India.  
**Mobile:** +91-7889581978. **E-mail:** heenasn50@gmail.com

planning to address the anticipated difficulty in airway access.

## CASE REPORT

We present a case of a 40-year-old female posted for laparoscopic nephrectomy. She was American Society of Anesthesiology physical status Grade I and. Gave a history of restrictive mouth opening since childhood because of bilateral TMJ. Her systemic examination was normal and all pre-operative investigations were within normal limits. She was lean and thin and her body mass index was 23/BSA.<sup>2</sup> On airway examination, her inter incisor gap was 17 mm, MPG Class III, and the temporomandibular joint movement was moderately restricted (Figure 1). The thyromental distance was 6.5 cm, the sternomental distance was 12 cm, and the neck flexion and extension were normal.

All the concerns regarding the anticipated difficult airway and related complications were discussed with the surgical team and explained to the patient and her family. Since the mouth opening of the patient was 17 mm awake intubation with KVVV was planned and the patient was explained about the same. A difficult airway cart was kept ready and the backup team for tracheostomy was also called into the operation theater.

Injection Glycopyrrolate 0.2 mg was given intramuscularly 30 min before the procedure. Dexmedetomidine bolus 0.5 mg/kg was given over 10 min followed by infusion at the rate of 1 mg/kg/h. Oxygenation was started by nasal cannula @ 10 L/min. The airway of the patient was anesthetized using 4 mL of 2% xylocaine nebulization for 5 min and two puffs of 10% lignocaine spray during inspiration over the oropharynx, tonsillar pillars, and base of the tongue. Transtracheal injection of 2 mL of 2%



**Figure 1:** Patient with limited mouth opening with interincisor gap of 17 mm

lignocaine was given through the cricothyroid membrane. Gentle suction at the posterior pharyngeal wall was done to check the adequacy of topicalization.

We introduced the channeled blade of KVVV loaded with Endotracheal tube (ETT) number 7.0 into the patient's mouth and were able to get Cormack and Lehane Grade II view, but ETT could not be negotiated through the vocal cords. Bougie was used through the ETT to guide, but it was unsuccessful. Since we had a flexible fiberoptic bronchoscope (FOB) with us, it was introduced through the lumen of the ETT by another anesthesiologist who was able to negotiate it through the vocal cords successfully and ETT was railroaded over it under direct vision. The patient tolerated the procedure well without any gag reflex. General anesthesia was given after confirming the correct placement of ETT by capnography. The intra-operative period was uneventful, and the patient was extubated when she was fully awake. Postoperatively patient remained stable throughout.

## DISCUSSION

The preferred method for managing patients with TMJ joint ankylosis and restricted mouth opening is awake intubation using a flexible FOB. Various guidelines have recommended that ATI should be considered in the presence of predictors of difficult intubation because of its high success rate and low-risk profile and have emphasized the usage of combination techniques for the same.<sup>5</sup>

King vision VL (KVVV) has been used for awake intubation by a few authors in case reports and case series. Ahmad et al., observed low failure rates and fewer complications when using KVVV in traumatic cervical spine patients.<sup>6</sup> Ali et al., found KVVV a good option for awake intubation in patients with severe ankylosing spondylitis.<sup>7</sup> Gaszynska et al., also recommended using KVVV as a favorable alternative to flexible fiberscope for awake intubation.<sup>8</sup>

We did not use FOB as the primary strategy for awake intubation in our patient because VL are frequently being used in our institution and we are well versed in its usage. The inter incisor gap in our patient was 17 mm which could accommodate the channeled blade of the VL. Difficult airway society guidelines for ATI recommend that choosing which technique to use for awake intubation is based on patient factors, operator skills, and equipment availability.<sup>5</sup>

We could not find any literature regarding the combined use of a flexible fiberscope and channeled KVVV in a patient with TM joint ankylosis with restrictive mouth opening there is limited published literature available regarding the use of VLs in cases with restricted mouth opening. Ali

et al., found that a minimum mouth opening of 18 mm is necessary for introducing the channeled blade of KVVVL.<sup>7</sup> Khan et al., successfully utilized C-MAC VL and FOB in a patient with a mouth opening of 1.5 cm.<sup>9</sup>

Few authors have used this combination technique of a VL and FOB in patients with anticipated difficult airways. Gaszyński used a combination of KVVVL and fiberscope for awake intubation in a patient with a laryngeal tumor. They found the technique easier and more effective than each being used alone.<sup>10</sup> Khan et al., emphasized the importance of familiarity with multiple techniques of ATI, both individually and in combination.<sup>9</sup>

This simultaneous use of FOB and KVVVL has certain advantages compared to individual techniques. VL provided us with a wider and clearer view of airway structures. Further, the use of VL provided a conduit for FOB for easy placement in the vicinity of the glottis. FOB has the advantage of its controllable tip that was easily negotiated into the glottis through a clear view provided by VL. Further, we were able to visualize the railroading of the tube over the flexible bronchoscope preventing any injury to the airway structures that can occur because of the blind railroading when FOB is used alone.

Limitations with the use of the above technique are non-cooperative patients and severe restrictions of mouth opening.

## CONCLUSION

Concurrent utilization of FOB and VL can be considered a feasible option for awake intubation in patients with moderate restrictions in mouth opening. This is altogether more important when individual intubation methods prove unsuccessful, and this approach can be extended to other challenging airway situations also.

## ACKNOWLEDGMENT

Nil.

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### Authors' Contributions:

**SG**- Concept and design, manuscript preparation, revision of manuscript and consultant incharge; **RG**- Concept and design, review of manuscript, manuscript preparation and treating urologist; **NG** -Consultant incharge, review of manuscript, manuscript preparation; **HS** - Manuscript preparation, review of manuscript.

### Work attributed to:

Acharya Shri Chander College of Medical Sciences and Hospital Sidhra, Jammu, Jammu and Kashmir, India.

### Orcid ID:

Sunana Gupta - <https://orcid.org/0000-0002-8518-8254>

Rahul Gupta - <https://orcid.org/0000-0002-6188-2890>

Nandita Mehta - <https://orcid.org/0000-0001-6003-3339>

Dr. Heena Saini - <https://orcid.org/0000-0002-6019-2839>

**Source of Support:** Nil, **Conflicts of Interest:** None declared.