



## COMPARATIVE ANALYSIS OF TRACHEAL INTUBATION EASE: INTUBATING VIDEO-STYLET VERSUS C-MAC VIDEO LARYNGOSCOPE

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### ABSTRACT

**Background:** Successful tracheal intubation is a critical skill in airway management, and various tools have been developed to enhance this process. This study compares the ease of tracheal intubation using an intubating video-stylet with the C-MAC video laryngoscope.

**Objectives:** To assess the time taken for tracheal intubation using both devices and to evaluate the success rate and ease of use as perceived by the anesthesiologists.

**Methods:** This prospective, randomized study included 100 adult patients undergoing elective surgery requiring general anesthesia. Inclusion criteria comprised adults aged 18-65 years with a Mallampati score of I or II. Exclusion criteria included patients with anticipated difficult airways, cervical spine abnormalities, or previous tracheostomy. Participants were randomly assigned to either the intubating video-stylet group or the C-MAC group. Intubation time, success rate, and subjective ease of use were recorded.

**Results:** The intubating video-stylet group demonstrated a shorter mean intubation time compared to the C-MAC group (12.3 seconds vs. 15.4 seconds). The success rate was similar between both groups, but the intubating video-stylet was rated higher for ease of use.

**Conclusion:** The intubating video-stylet provides a quicker intubation time with favorable ease of use compared to the C-MAC video laryngoscope, suggesting it may be a beneficial alternative in routine practice.

**Keywords:** tracheal intubation, video-stylet, C-MAC video laryngoscope, airway management, anesthesia.

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### INTRODUCTION

Tracheal intubation is a fundamental procedure in airway management, essential for ensuring adequate ventilation during general anesthesia or in critical care settings (1). The evolution of intubation techniques has been marked by the development of various devices aimed at improving the success rates and efficiency of the procedure. Traditional direct laryngoscopy, while effective, can be challenging in certain clinical scenarios, such as in patients with limited neck mobility or anatomical variations (2). This

has led to the introduction of video laryngoscopes, which provide a better view of the vocal cords and can facilitate successful intubation in difficult airways (3).

The C-MAC video laryngoscope, known for its high-resolution camera and adjustable viewing angle, has gained popularity in recent years (4). It enhances visualization during intubation, potentially reducing the number of failed attempts and associated complications. However, while effective, it may still require a

learning curve for novice users and can be cumbersome in certain clinical scenarios (5).

On the other hand, the intubating video-stylet combines the advantages of video visualization with the flexibility of a standard stylet, allowing for easier manipulation of the endotracheal tube. This device is designed to facilitate intubation by providing a real-time video feed of the airway while allowing the operator to maneuver the tube more intuitively (6). Early studies suggest that it may offer comparable or even superior performance in terms of intubation time and ease of use (7, 8).

Given the clinical significance of effective airway management and the continuous search for optimizing intubation techniques, this study aims to compare the ease of tracheal intubation using an intubating video-stylet versus the C-MAC video laryngoscope. The findings could have important implications for anesthesia practices and airway management strategies.

#### **Aim and Objectives**

**Aim:** To compare the ease of tracheal intubation using an intubating video-stylet versus the C-MAC video laryngoscope.

#### **Objectives:**

1. To measure and compare the time taken for successful tracheal intubation using both devices.
2. To evaluate the perceived ease of use of each device as reported by the anesthesiologists.

#### **Materials and Methods**

This prospective, randomized study was conducted at a tertiary care hospital and involved 100 adult patients scheduled for elective surgeries requiring general anesthesia. Inclusion criteria included adults aged 18-65 years with a Mallampati score of I or II, indicating an anticipated straightforward intubation. Exclusion criteria encompassed patients with known difficult airways, cervical spine abnormalities, and those with previous tracheostomy or other significant anatomical anomalies. Participants were randomly assigned to either the intubating video-stylet group or the C-MAC group. Intubation time was measured from the insertion of the device until successful placement of the endotracheal tube, while the success rate was recorded for each attempt. After the procedure, anesthesiologists rated the ease of use on a 10-point scale.

#### **Results**

**Table 1: Intubation Times and Success Rates**

Device	Mean Intubation Time (seconds)	Success Rate (%)
Intubating Video-Stylet	12.3	98
C-MAC Video Laryngoscope	15.4	96

Description: Table 1 summarizes the mean intubation times and success rates for the intubating video-stylet and the C-MAC video laryngoscope. The intubating video-stylet demonstrated a significantly shorter mean intubation time and a slightly higher success rate compared to the C-MAC video laryngoscope, indicating its effectiveness as a tool for airway management.

**Table 2: Ease of Use Ratings**

Device	Ease of Use Rating (1-10)
Intubating Video-Stylet	8.7
C-MAC Video Laryngoscope	7.5

Description: Table 2 presents the ease of use ratings for the intubating video-stylet and the C-MAC video laryngoscope. The intubating video-stylet received a higher rating of 8.7, indicating a greater perceived ease of use compared to the C-MAC video laryngoscope, which scored 7.5. This suggests that anesthesiologists found the intubating video-stylet more intuitive and user-friendly during the intubation process.

#### **Discussion**

The findings of this study indicate that the intubating video-stylet significantly outperforms the C-MAC video laryngoscope in terms of mean intubation time and ease of use. With a mean intubation time of 12.3 seconds, the intubating video-stylet demonstrates its efficiency in facilitating quicker airway access, which is particularly crucial in emergency settings

where every second counts (1, 2). Additionally, the higher success rate and ease of use ratings highlight its potential advantages over traditional and even advanced video laryngoscopy techniques.

Previous research has suggested that the learning curve associated with video laryngoscopes can hinder their initial effectiveness, especially for novice practitioners (3, 4). The intubating video-stylet may mitigate this issue by allowing more intuitive control over the endotracheal tube while still providing visual guidance, thus catering to both experienced and less experienced clinicians (5, 6). Furthermore, the flexibility of the video-stylet allows for adjustments in real-time, which could enhance outcomes in challenging intubation scenarios.

Despite the promising results, it is essential to consider potential limitations. The study was conducted in a controlled environment with a specific patient population, which may not fully represent the diverse scenarios encountered in practice (7). Further studies involving larger and more varied cohorts, as well as investigations into specific clinical scenarios, will be beneficial in validating these findings.

In conclusion, this study suggests that the intubating video-stylet offers an effective alternative to the C-MAC video laryngoscope, providing quicker intubation times and greater ease of use. Incorporating such devices into routine practice could enhance airway management outcomes and improve overall patient safety during anesthesia.

## Conclusion

The comparative analysis of tracheal intubation using an intubating video-stylet and a C-MAC video laryngoscope reveals that the video-stylet provides a faster mean intubation time and is perceived as easier to use by anesthesiologists. These advantages highlight the potential of the intubating video-stylet as a valuable tool in airway management, particularly in settings where rapid intubation is critical. Continued evaluation of emerging technologies in anesthesia will be essential to enhance patient outcomes and ensure the highest standards of care.

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