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Successful Management of a Broken Stylet Retained in Tracheobronchial Tree: A Case Report

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1. Abstract

In Covid-19 pandemic, the use of video laryngoscope for tracheal intubation is highly recommended due to the increasing distance between patient's airway and operator. An endotracheal tube with an intubating stylet has been proposed to facilitate tracheal tube insertion, especially when video laryngoscope was used. Thus in routine anesthesia practice intubating stylet is used as an aid in tracheal intubation for confirmed or suspected Covid-19 infected patients. At the present time, the disposable plastic covered or plastic bougie is more recommended but in some institutes, the malleable aluminum stylets are still in use. Though shearing of part of the stylet has been reported in past but we report a case with as unrecognized broken piece of stylet into his right main bronchus, which was later extracted immediately and successfully before causing adverse symptoms or hurts.

2. Introduction

In Covid-19 pandemic, the use of video laryngoscope for tracheal intubation is highly recommended due to the increasing distance between patient's airway and operator [1]. An endotracheal tube with an intubating stylet has been proposed to facilitate tracheal tube insertion, especially when video laryngoscope was used [2]. Thus in routine anesthesia practice intubating stylet is used as an aid in tracheal intubation for confirmed or suspected Covid-19 infected patients. At the present time, the disposable plastic covered or plastic bougie is more recommended but in some institutes, the malleable aluminum stylets are still in use. Though shearing of part of the stylet has been reported in past[3] but we report a case with as unrecognized broken piece of stylet into his right main bronchus, which was later extracted immediately and successfully before causing adverse symptoms or hurts.

3. Case Report

A 21 years old man was admitted in the department of orthopaedics as a case of right clavicle fracture posted for open reduction and internal clavicle fixation. On physical examination, he was an average built man of 174 cm, weighing 62 kilogram. Pre anesthetic evaluation was normal. Airway evaluation did not predict difficult airway. He was classified as an American Society of Anesthesiologists physical status I (ASAI) and planned for general anesthesia with tracheal intubation. On scheduled day, the patient was taken to operation room and his baseline vital signs were all within normal values. Induction of general anesthesia was done with fentanyl 100 mcq,propofol 150 mg and rocuronium 50 mg intravenous after 5 minutes preoxygenation. Tracheal intubation was performed with endotracheal tube 7.5 mm ID preloaded with a malleable aluminum stylet. The anesthesiologist used video laryngoscope (GlideScope) for intubation smoothly but when the stylet was pulled out of the endotracheal tube with a little difficulty and some extra force was needed. The tracheal placement was confirmed by auscultation and checking end tidal CO2 concentration. Then the patient was mechanically ventilated with a tidal volume of 8 mL/kg and respiratory rate of 10 per min. Suddenly the assistant anesthetic nurse found the length of the previously removed

stylet appeared shorter, she informed and alarmed the anesthesiologist immediately. On the suspicion of broken metal of stylet, the anesthesiologist requested the surgeon to stop surgical disinfection and draping, then the mechanically ventilation mode was changed to artificially manually controlled with a lower tidal volume in order to decrease the positive airway pressure.

The anesthesiologist decided to go ahead with fiberoptic bronchoscopy. The bronchoscopy revealed a metallic mobile foreign body in the night main bronchus (Figure 1). The foreign body then was retrieved with biopsy forceps and brought up into the endotracheal tube and then removed successfully via the endotracheal tube. The foreign body was an aluminum rod about 4 cm in length and 2.5-3 mm in diameter (Figure 2). It looked like the malleable stylet and matched the size with the residual stylet (Figure 3).The was no bleeding or mucosa injury during the procedure. After removal, check bronchoscopy was performed, and the airways visualized both the sides up to the sub segmental level were all clear. Then the surgery was proceeded which lasted for 115 minutes and the intra-operation period remained uneventful. After completion of surgery, he was extubated and sent to the post operating recovery room smoothly. No cough, dyspnea and desaturation was noted.

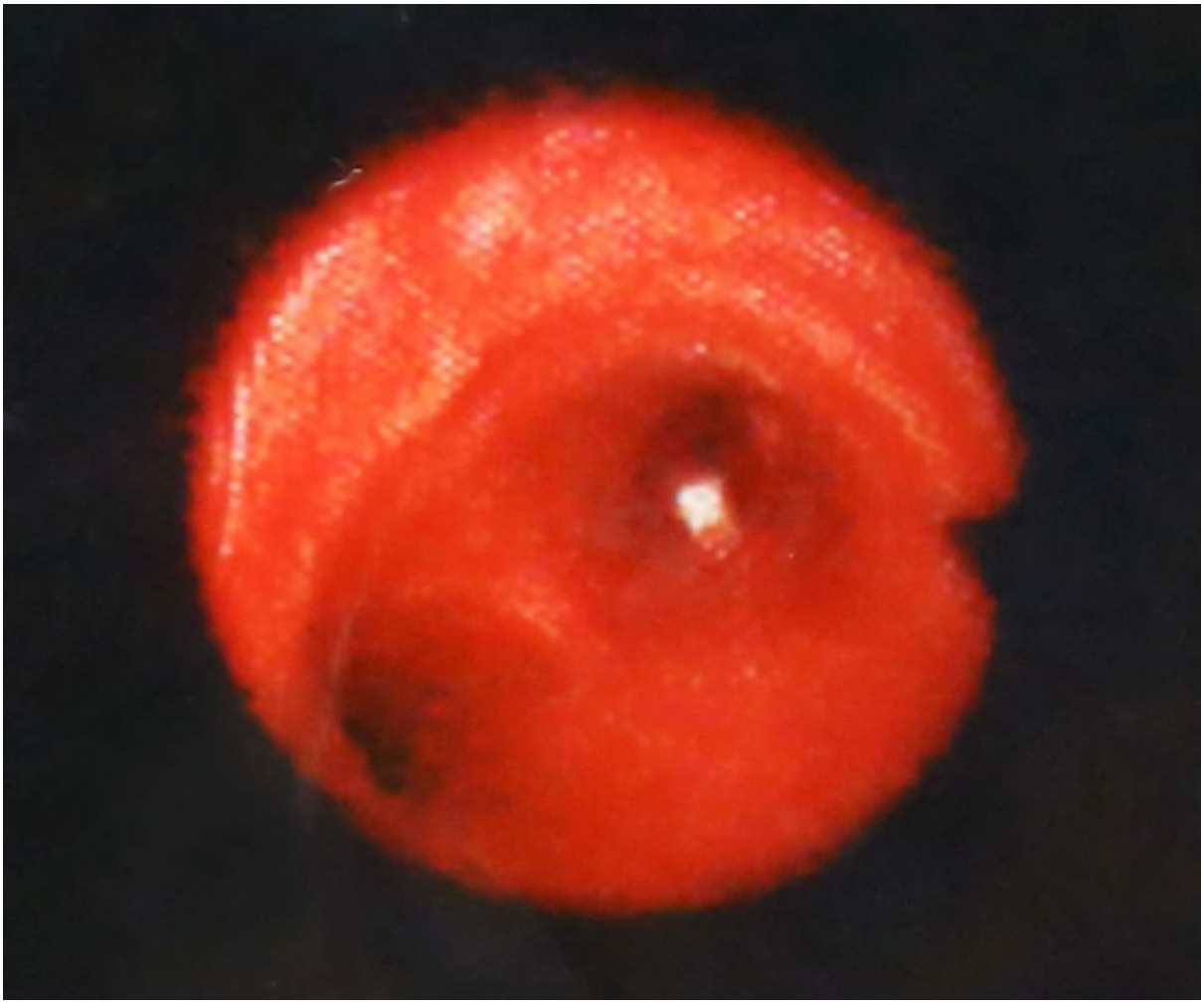

Figure 1: Metallic foreign body seen in the right main bronchus.

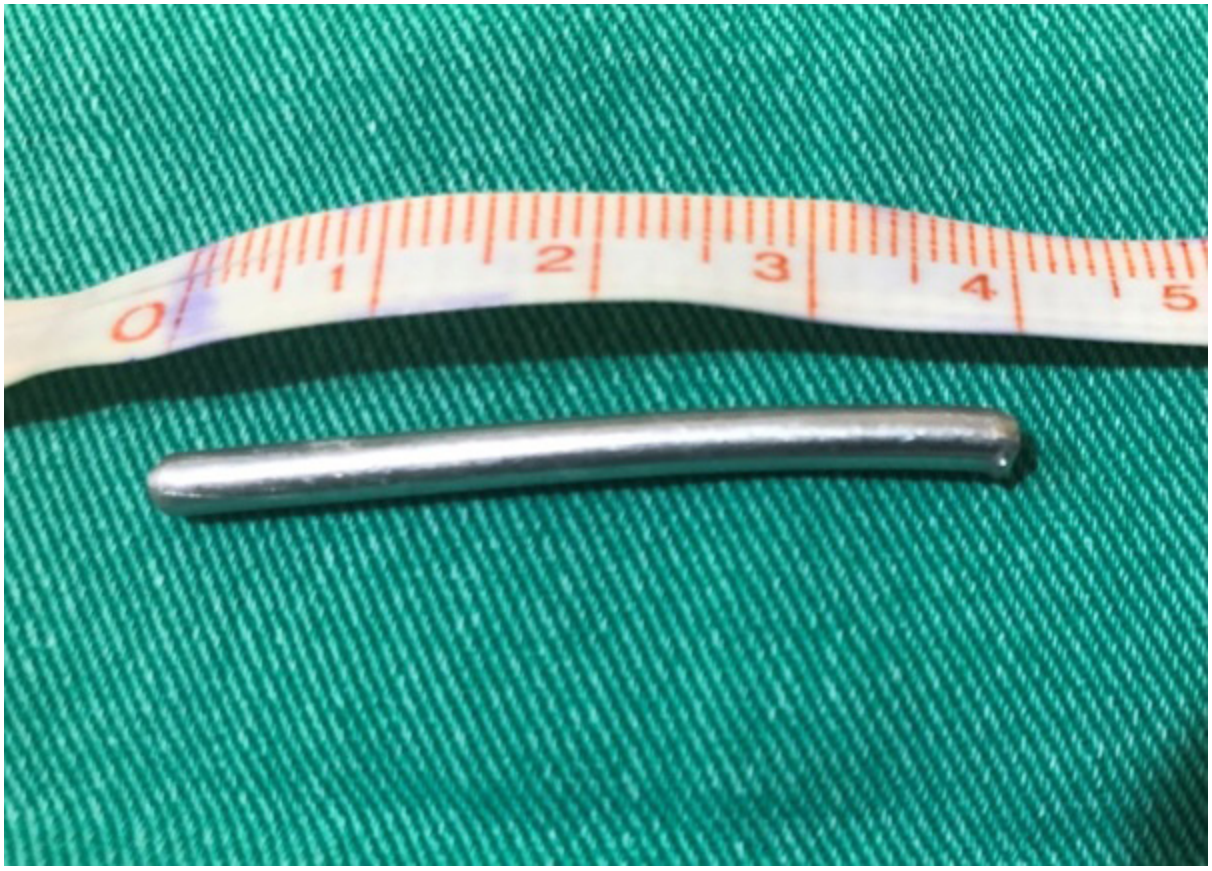

Figure 2: Removed broken piece of stylet from patient's right main bronchus.

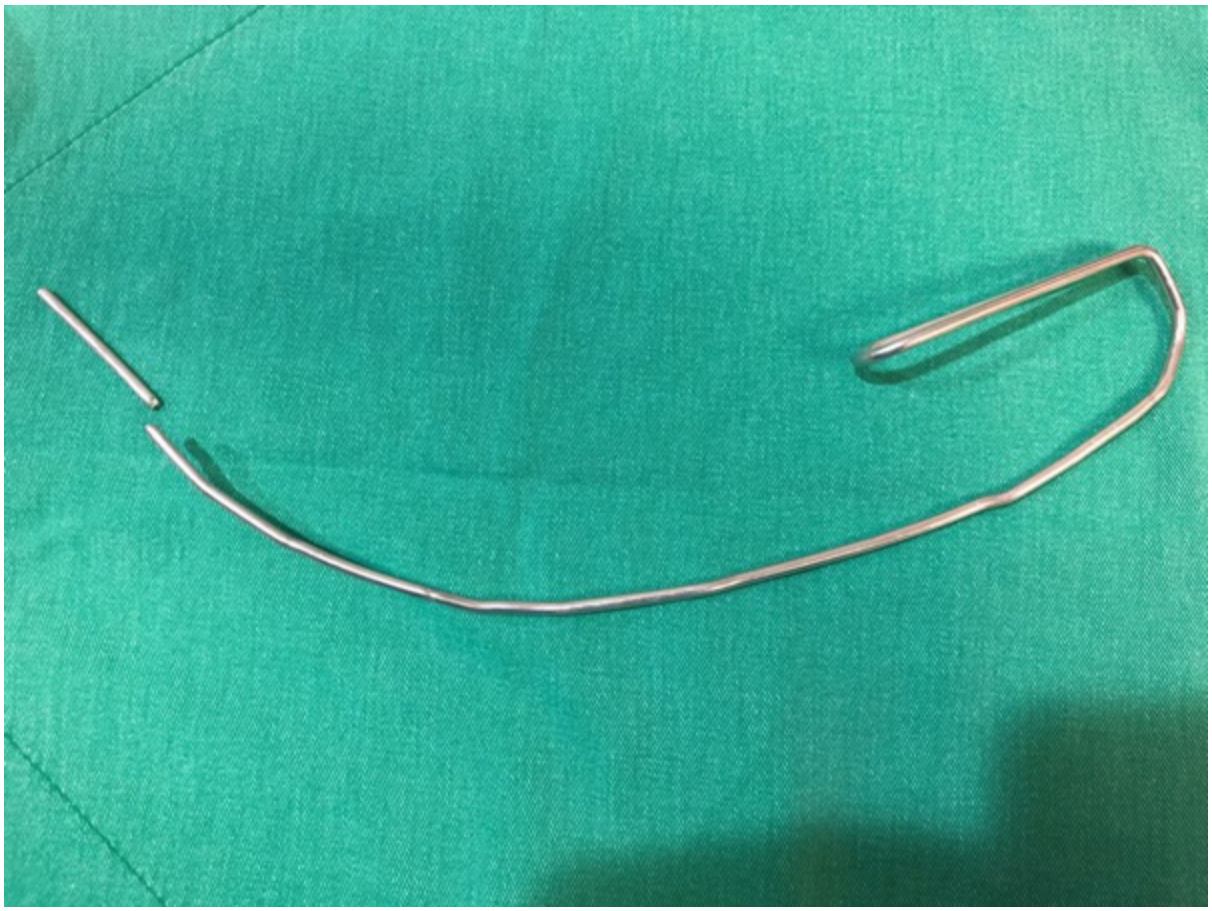

Figure 3: Proximal part and broken piece of stylet.

4. Discussion

Tracheal intubation of patients with coronavirus disease-19 (Covid-19) is a potentially aerosol-generating procedure that requires a careful and efficient approach to ensure the safety of both patients and healthcare providers (HCPs) [4]. Many guidelines recommend the use of video laryngoscopes to increase the operator's distance from the patient's airway and the chance of first-pass success [1]. When donned with personal protective equipment (PPE), the first-pass success rate and intubation time with video laryngoscopes are not affected when compared with direct laryngoscope [5]. Iatrogenic Inhaled foreign body might contribute to significant mortality and morbidity [6]. Fortunately, early detection and immediately proper action of our case greatly reduced the potential harm of this rare complication. Broken pieces of metallic stylet resulting in partial endotracheal tube obstruction has been reported by many scholars [7,8]. But in our case, we observed the broken stylet having migrated into the right main bronchus. This worsen the situation that was already difficult and dangerous. Aluminum stylet had been used which happened to be weakened leading to its fracture at the most vulnerable part. The main reason behind the breaking of the stylet was significant overuse. Since there are no clear markings in the stylet, its breakage went unnoticed after intubation and further management of the patient was continued. Fortunately the anesthetic nurse was very alert and noticed the unusual shortening of the stylet. Thus we strongly recommend careful evaluation of airway management equipment before and after procedures to prevent such iatrogenic complications.

5. Conclusions

We would like to conclude that a routine, regular check of equipment be performed to avoid such iatrogenic complication. If the removal of the stylet was difficult, the anesthesiologist should carefully examine the stylet to note if any portion of it has been damaged, broken or shorn off into the endotracheal tube or tracheobronchial tree.

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