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SuccessfulManagementofaBrokenStyletRetainedinTracheobronchialTree:A Case Report

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1. Abstract

InCovid-19pandemic,theuseofvideolaryngoscopefortracheal intubation is highly recommended due to the increasing distance betweenpatient'sairwayandoperator.Anendotrachealtubewith an intubating stylet has been proposed to facilitate tracheal tube insertion, especially when video laryngoscope was used. Thus in routineanesthesiapracticeintubatingstyletisusedasanaidintrachealintubationforconfirmedorsuspectedCovid-19infectedpatients.Atthepresenttime,thedisposableplasticcoveredorplastic bougieismorerecommendedbutinsomeinstitutes,themalleable aluminum stylets are still in use. Though shearing of part of the stylethasbeenreportedinpastbutwereportacasewithasunrecognizedbrokenpieceofstyletintohisrightmainbronchus,which was later extracted immediately and successfully before causing adverse symptoms or hurts.

2. Introduction

InCovid-19pandemic,theuseofvideolaryngoscopefortracheal 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 aidintrachealintubationforconfirmedorsuspectedCovid-19infectedpatients.Atthepresenttime,thedisposableplasticcovered orplasticbougieismorerecommendedbutinsomeinstitutes,the malleablealuminumstyletsarestillinuse.Thoughshearingof 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,whichwaslaterextractedimmediatelyandsuccessfully before causing adverse symptoms or hurts.

3. Case Report

A21 years old man was admitted in the department of orthopaedics as a case of right clavicle fracture posted for open reduction andinternalclaviclefixation.Onphysicalexamination,hewasan 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 anAmerican Society ofAnesthesiologists 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 wasperformedwithendotrachealtube7.5mmIDpreloadedwitha malleablealuminumstylet.Theanesthesiologistusedvideolaryngoscope(GlideScope)forintubationsmoothlybutwhenthestylet was pulled out of the endotracheal tube with a little difficulty and some extra force was needed. The tracheal placement was confirmedbyauscultationandcheckingendtidalCO2concentration.
Then the patient was mechanically ventilated with a tidal volume of8mL/kgandrespiratoryrateof10permin.Suddenlytheassistantanestheticnursefoundthelengthofthepreviouslyremoved

styletappearedshorter,sheinformedandalarmedtheanesthesiologist immediately. On thesuspicion of broken metalof stylet,the anesthesiologistrequestedthesurgeontostopsurgicaldisinfection anddraping,thenthemechanicallyventilationmodewaschanged toartificiallymanuallycontrolledwithalowertidalvolumeinorder to decrease the positive airway pressure.

Theanesthesiologistdecidedtogoaheadwithfiberopticbronchoscopy. The bronchoscopy revealed a metallic mobile foreign body in the night main bronchus (Figure 1).The foreign body then was retrievedwithbiopsyforcepsandbroughtupintotheendotracheal tubeandthenremovedsuccessfullyviatheendotrachealtube.The foreignbodywasanaluminumrodabout4cminlengthand2.5-3 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.

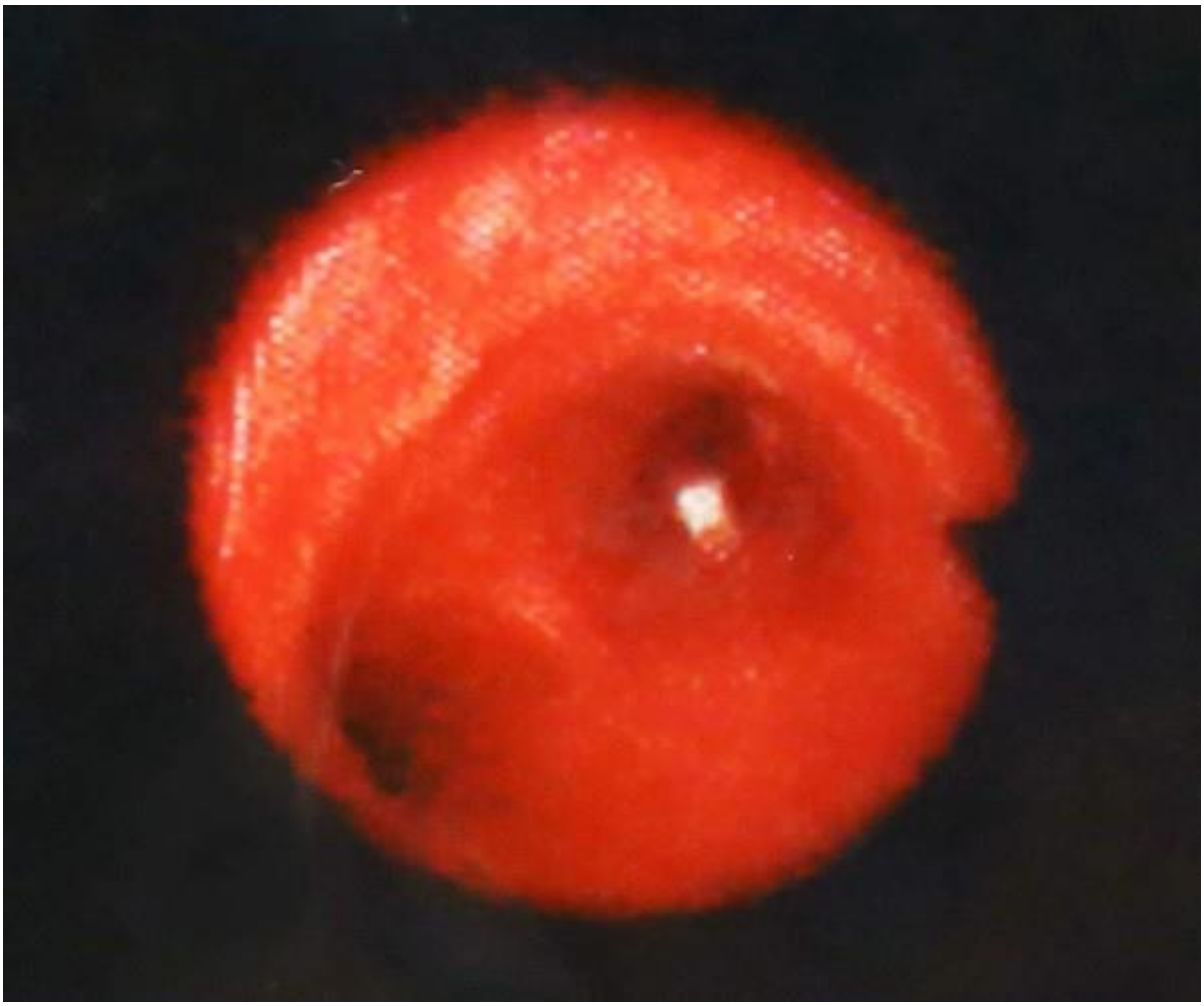

Figure1: Metallicforeign bodyseen inthe rightmain bronchus.

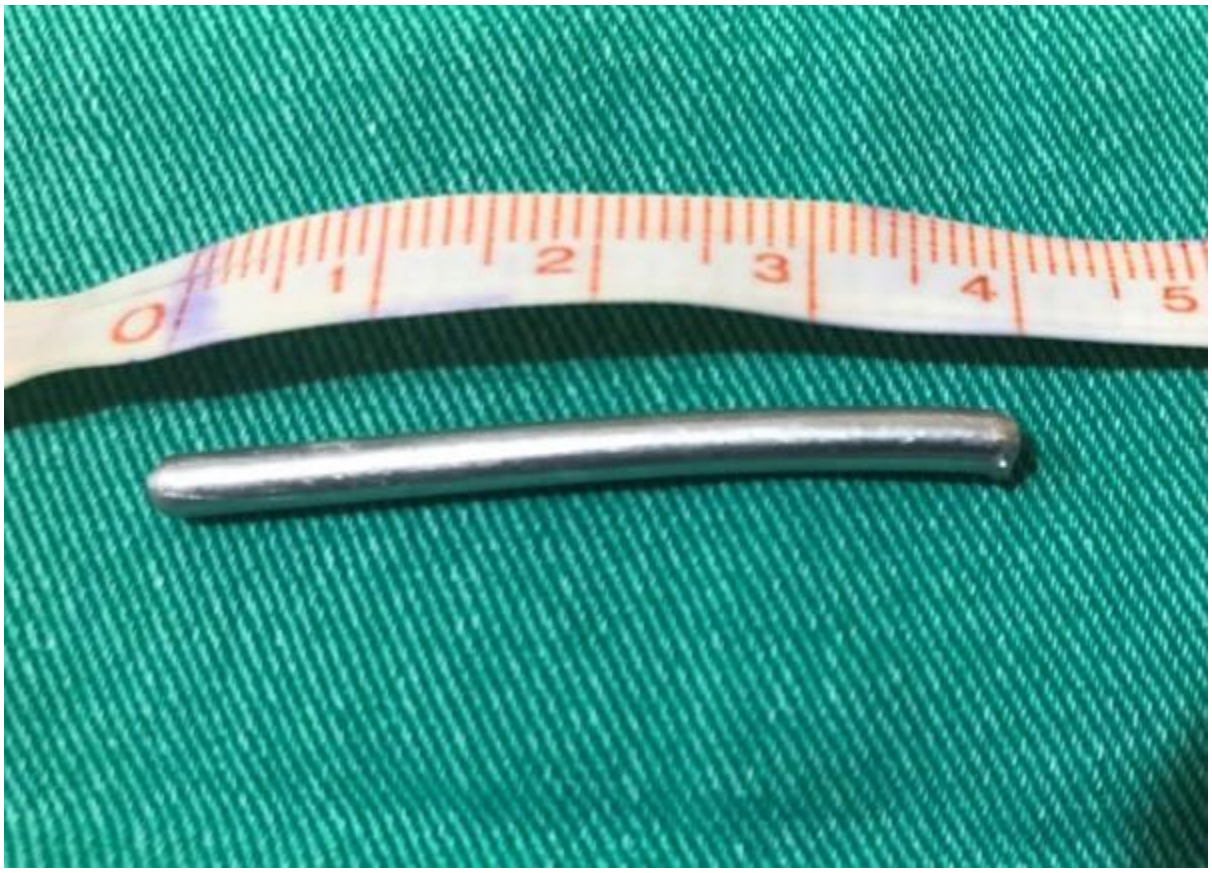

Figure2:Removedbrokenpieceofstyletfrompatient'srightmainbronchus.

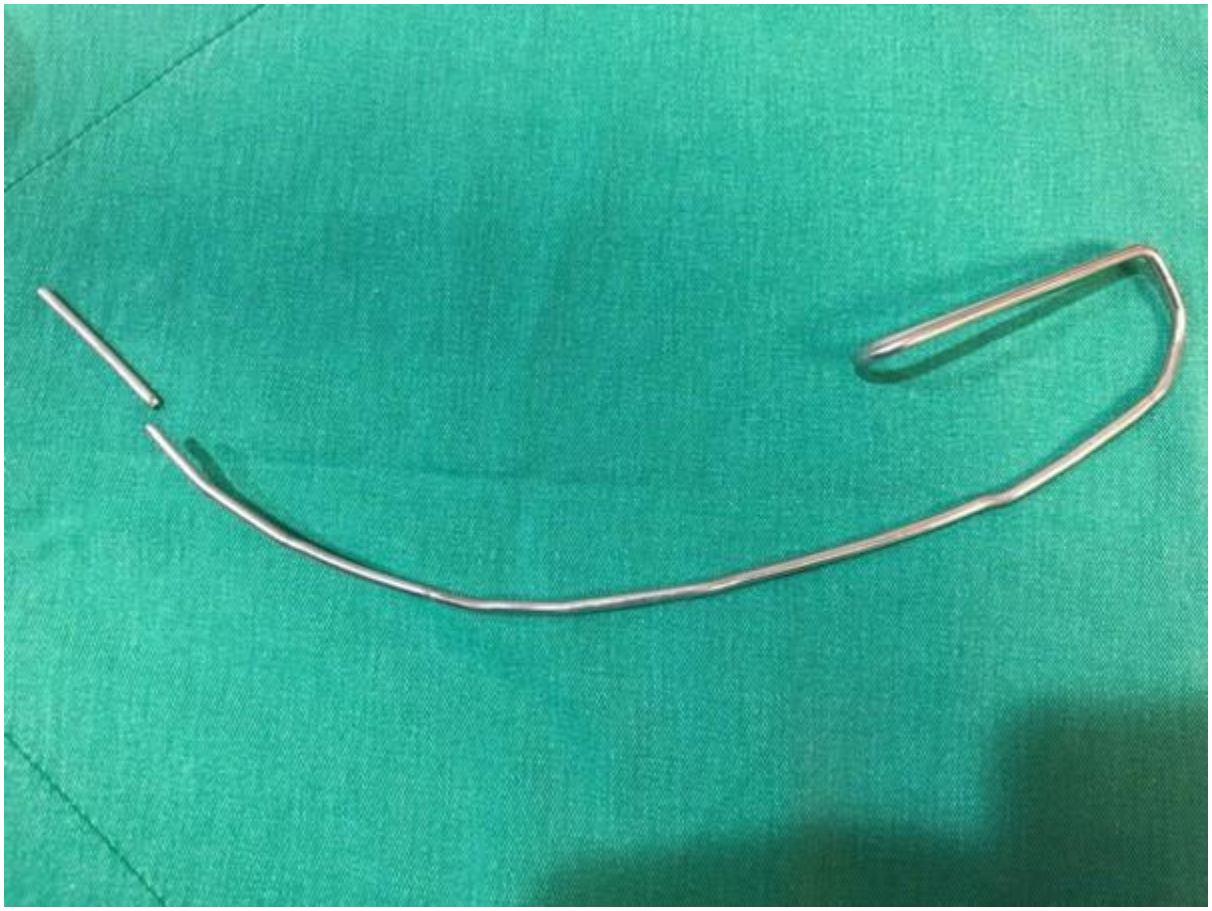

Figure3:Proximal partandbroken pieceof stylet.

4. Discussion

Trachealintubationofpatientswithcoronavirusdisease-19(Cov- id-19)isapotentiallyaerosol-generatingprocedurethatrequiresa carefulandefficientapproachtoensurethesafetyofbothpatients andhealthcareproviders(HCPs)[4].Manyguidelinesrecommend the use of video laryngoscopes to increase the operator's distance from the patient's airway and the chance of first-pass success [1]. Whendonnedwithpersonalprotectiveequipment(PPE),thefirst-passsuccessrateandintubationtimewithvideolaryngoscopesare not affected when compared with direct laryngoscope [5]. Iatro-genicInhaledforeignbodymightcontributetosignificantmortali-tyandmorbidity[6].Fortunately,earlydetectionandimmediately proper action of our case greatly reduced the potential harm of this rare complication. Broken pieces of metallic stylet resulting inpartialendotrachealtubeobstructionhasbeenreportedbymany scholars[7,8].Butinourcase,weobservedthebrokenstylethav- ing migrated into the right main bronchus. This worsen the situa-tionthatwasalreadydifficultanddangerous.Aluminumstylethad been used which happened to be weakened leading to its fracture at the most vulnerable part. The main reason behind the breaking ofthestyletwassignificantoveruse.Sincetherearenoclearmark-ingsinthestylet,itsbreakagewentunnoticedafterintubationand further management of the patient was continued. Fortunately the anestheticnursewasveryalertandnoticedtheunusualshortening of the stylet. Thus we strongly recommend careful evaluation of airwaymanagementequipmentbeforeandafterprocedurestopre-vent such iatrogenic complications.

5. Conclusions

We would like to conclude that a routine, regular check of equip-ment 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,brokenorshornoffintotheendotrachealtubeortrache-obronchial tree.

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