Case Report

Stuck suction catheter in endotracheal tube

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Abstract

Endotracheal tube (ETT) suction is essential to clear secretions so that airway patency can be maintained. Stuck suction catheter in ETT is an uncommon event, and it can be dangerous in patients with difficult airway cases.

Keywords: Endotracheal tube, hypoxia, suction catheter

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Introduction

Suction of the endotracheal tube (ETT) is routine and common procedure in intensive care unit to clear secretions and to keep the airway patent so that oxygenation and ventilation in an intubated patient can be optimized. ETT suction can cause hypoxia due to oxygen suction from the lung and alveoli collapse. However it can be managed with ventilation with 100% oxygen with positive end expiratory pressure for some time. However impaction of suction catheter in ETT can be a hazardous event as patient cannot be ventilated unless ETT is changed.

Case Report

A 56-year-old male patient was admitted with cardiogenic shock and congestive heart failure. In view of desaturation, patient was intubated using ETT of size 8.5 mm. Patient was started inotropes, and optimal ventilatory management was done to stabilize the patient. On the 2nd day of the event, during routine suctioning of ETT with 12 French gauge suction catheter nursing staff observed significant resistance to pull out of suction catheter inserted in ETT. Suction tubing was immediately disconnected and efforts to gently pull out catheter while rotating were made, but unsuccessful. As patient started desaturating (saturation 75%), ETT with

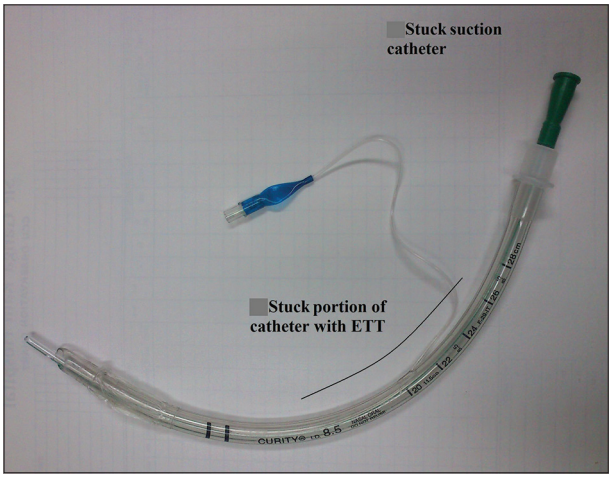

Figure 1: Stuck suction catheter

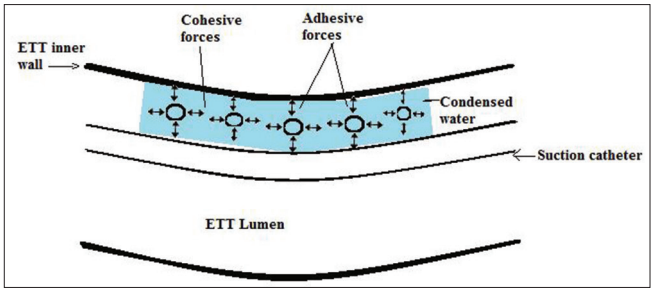

Figure 2: Mechanism of stuck suction catheter

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suction catheter *in situ* was immediately removed after deflating pilot balloon of ETT. Patient was reintubated with new ETT of size 8.5 mm. After ventillation was started, saturation improved. Removed ETT with stuck catheter [Figure 1] was examined. Catheter was inside the main lumen of ETT, not coming out of murphy's eye. No obvious thick, viscous secretions were noted. There was still resistance to pull out suction catheter from ETT. However, when ETT was straightened from its original curved position, catheter could be removed easily.

Discussion

Impaction of suction catheter in preformed nasotracheal tube in a pediatric dental patient has been reported.[1] Resistance to pull out suction catheter, which has entered murphy eye of ETT has been described by Jagannathan and Pak[2] Gupta *et al*. have reported case of impaction of suction catheter within ETT even though the catheter was of recommended size and there was no knotting inside the ETT.[3] Dubey and Sanjeev have reported impaction of suction catheter in pediatric ETT as these ETT have a smaller lumen and sharper curve.[4]

In the present case, catheter was stuck along the inner anterior wall of ETT. Moisture layer due to water condensation along the inner wall of ETT might have caused close contact between ETT and catheter. Molecules in the liquid state, e.g., water experience strong intermolecular attractive forces. These forces between like molecules are called as cohesive forces. The attractive forces between unlike molecules, e.g. water and wall of tube or catheter are said to be adhesive forces.[5] Combination of cohesive and adhesive forces [Figure 2] make catheter stuck to the inner wall of ETT. Any disruption or agitation of interposed water breaks the forces and make the catheter free from ETT wall. This can be the reason why catheter could be pulled out easily when ETT was straightened.

Singh and Chugh also have suggested small amounts of condensed vapor between the outer surface of the suction catheter and the inner aspect of the ETT's anterior wall causing rise in surface tension, which leads to impaction of catheter in ETT.[6] Straightening of ETT might be a useful way to remove the stuck catheter.

Choosing properly sized catheter for suctioning is essential. The size of the suction catheter in French Gauge should be < 1½ times the size of the ETT's internal diameter in mm.[4] Use of lubricated catheter

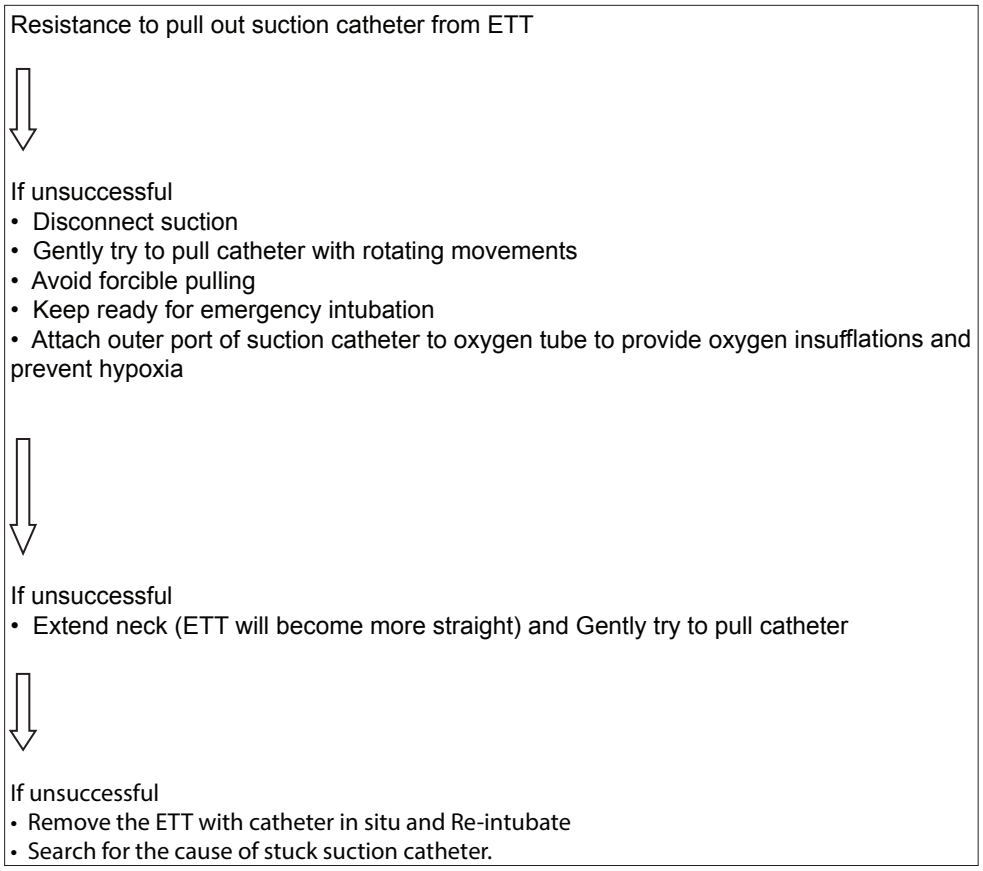

Figure 3: Proposed algorithm for management of stuck suction catheter in endotracheal tube

or siliconized suction catheter is advocated specially in children as premedication with glycopyrrolate makes secretions thick and viscous.[3,4]

Stuck suction catheter in ETT is an unusual event, and it can be fatal in patients with difficult airway cases. We propose an algorithm [Figure 3] for management in such emergency cases.

References

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