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CUFF INFLATION ASSEMBLY FAILURE - A POTENTIAL CAUSE OF VOCAL CORD TRAUMA: A CASE REPORT

Anesthesiology

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ABSTRACT

Cuff inflation assembly failure can cause problem at the time of intubation, during surgery or at the time of extubation. Incomplete inflation of the endotracheal tube cuff or complete failure to inflate the cuff can cause difficulty in ventilating the patient. Similarly incomplete deflation can lead to vocal cord trauma which can lead to edema of the vocal cords. Therefore, cuff inflation assembly pre-check becomes necessary to prevent such complications. But sometimes kinking of the inflation line due to various reasons may occur leading to difficulty in inflating or deflating the endotracheal tube cuff. We present a case of difficult extubation due to unanticipated cuff inflation assembly malfunction as a consequence of kinking of inflation line under the endotracheal tube fixation.

KEYWORDS

Cuff inflation assembly

INTRODUCTION

Cuff inflation assembly is an integral part of an endotracheal tube and it's proper functioning is likewise integral while securing the airway. This itself speaks for the importance of checking endotracheal tube and the assembly before embarking on laryngoscopy and tracheal intubation for a leaking cuff inflation assembly will require a reattempt at securing the airway and difficulty in deflating the cuff will pose a threat at the time of extubation.[1] We hereby report an unusual case of inability to deflate the cuff during extubation despite ensuring proper working of cuff inflation assembly preoperatively.

Case Report

A 54 year old female with insignificant past medical and surgical history came with a non union of supracondylar fracture of right humerus following slip and fall 3 months back. On seeking consent, patient denied block or regional anaesthesia. After proper pre anaesthetic check up, patient was taken up for ORIF. General anaesthesia was planned and patient was induced with fentanyl 2mic/kg, thiopentone sodium 5mic/kg and airway was secured with pre checked ETT of size 7.5mmID and tube was fixed at 21 cm using dynaplast after confirmation of equal and adequate bilateral air entry. Intraoperative period was uneventful. At the time of extubation, ETT removal was attempted after deflating the pilot balloon only to meet resistance at first go. After eliminating the obvious resistance due to tube bite by patient, ETT was removed with certain force in the second attempt. On examining the ETT after its removal, it was found the cuff was still inflated even after complete deflation of the pilot balloon. So as to further examine the cuff inflation assembly, the adhesive dynaplast encasing the ETT was removed and spontaneous inflation of pilot balloon was observed. Both ETT cuff and pilot balloon could be inflated and deflated effortlessly thereafter. It was inferred after this observation that the inflation line could have been entrapped at its junction with the ETT due to taut adhesive.

FIGURE 1 depicts the inflated ETT cuff while the pilot balloon is deflated because of kinking under the dynaplast.

FIGURE 2 depicts spontaneous inflation of the pilot balloon when the dynaplast was removed while the ETT cuff was still inflated.

DISCUSSION

The case report illuminates the importance of taking care of the inflation line during fixation of the ETT to prevent it's entrapment. An obscured inflation line can present with either persistent under-inflation of the cuff or persistent inflation or over-inflation of the cuff.
In the first circumstance, the pilot balloon is fully inflated and the pressure gauge reading is normal, but the ETT cuff is deflated or underinflated. This could cause persistent air leak, inability to ventilate, and aspiration of fluids past the cuff. [2,3]

In the second circumstance, the pilot balloon is deflated or fully inflated and the pressure gauge reading is normal, but the ETT cuff is inflated or overinflated. This could cause a false failure of the cuff leak test, inaccurate cuff pressure, and/or difficulty removing the ETT.[4,5]

We came across the later case in which difficulty in removing ETT was faced due to sustained inflation of ETT cuff even after deflation of pilot balloon.

CONCLUSION

Thus, taking care of the inflation line while applying the adhesive to secure the ETT after confirming it's correct placement or removing the adhesive completely before extubation can prevent such unfortunate complications and thereby preventing trauma to the vocal cords. The lead that indicates obstruction of the pilot balloon tubing are small amount of air (1-2 mL) required to deflate or inflate the pilot balloon or complete failure to inflate or deflate it.[6]

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