

Suction Catheter Impaction In Preformed Nasal Endotracheal Tube (PNETT) During Pediatric Dental Anesthesia - Hazard Notice

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Citation

M Takroui, R Nafakh, A Abbas. *Suction Catheter Impaction In Preformed Nasal Endotracheal Tube (PNETT) During Pediatric Dental Anesthesia - Hazard Notice*. The Internet Journal of Anesthesiology. 2008 Volume 22 Number 1.

Abstract

A four years old female child was scheduled for dental conservative surgery under general anesthesia using preformed nasal tracheal intubation (PNETT). The immediate post intubation auscultation revealed crackles sounds which necessitated endotracheal suction. On withdrawing the suction catheter (SC), it was stuck inside the tube, and gentle to moderate pulling on SC did not relieve the impaction. Striating PNETT and further more forceful pulling complicated the procedure. SC was cut into two parts; one exited from endotracheal tube and part was left inside. A great worry of migration of this part into the trachea made a great concern. As the patient still anesthetized and well oxygenation the authors opted for removing gently the tube and re-intubate. The other part of severed SC was impacted inside the nasal tube. The author slit open the tube to insure the presence of that part in . This case report describes the event and reviews reason of obstructed by SC.

INTRODUCTION

In a pediatric dental patient with a preformed nasal endotracheal tube (PNETT) [Mallinckrodt Ireland] a suction catheter (SC) [[Mallinckrodt Ireland] was used, an unexpected complication occurred due to the impaction of SC and further cutting on pulling vigorously. A considerable length of SC was lost inside PNETT leading to potential obstruction or migration of the lost part into the trachea. Usually endotracheal devices like ventilation endotracheal tube used in anesthesia have the potential risk of mucous plug or clot obstruction [1, 2]. Nasal tube may be obstructed by nasal tissues or debris [3]. Also trans-tracheal oxygen delivery catheter in oxygen therapy has the potential risk as well of mucous plug obstruction [4, 5]. To our knowledge, this complication has not been reported before. This paper reports the possible causes and our management.

CASE REPORT

A four years old female child was scheduled for dental care under general anesthesia. She was a dawn syndrome case with generalized dental caries. On examination she was looking free from active respiratory and cardiovascular illnesses. Mother reported past history of recurrent upper airways infection and runny nose on and off during the past weeks. Blood tests were within normal limits and the child was accepted for general anesthesia using naso-tracheal

intubation. She received intravenous midazolam 0.1 mg.kg-1 in reception area of theatre. After shifting the patient to OR she was linked to basic monitoring (ECG, pulse oximetry NIBP monitor, temperature and the patient was induced with inhalation of sevoflurane up to concentration of 3% and when patient was deep ly unconscious PNETT No 4.5 was accommodated and was successfully settled in the trachea as demonstrated with Endtidal capnography and movement of chest on manual ventilation. During post intubation auscultation of the chest. The immediate auscultation post intubation revealed crackles sounds which necessitated endotracheal suction. SC Fr. G. No 10 was introduced and suction was performed easily. On withdrawing the catheter, it was stuck inside the tube. A gentle to moderate pulling on SC did not relieve the impaction. Striating PFNETT and further more forceful pulling complicated the intubation.

SC was cut in two parts; one exited from endotracheal tube and part was left inside. A great worry of migration of this part into the trachea made a great concern. As the patient still deeply under sevoflurane anesthesia and well oxygenated, the authors opted for removing gently the tube and re-intubate the patient. The other part of severed SC was impacted inside nasal tube as was found when the tube was slit open to insure the presence of entire part in (Fig.-1).

Another PFNETT was introduced smoothly and anesthesia

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was continued with sevoflurane –Nitrous oxide: oxygen and fentanyl in appropriate dose. Artificial ventilation was maintained with IPPV pressure controlled. After one hour conservative dental care surgery the patient recovered uneventfully and was discharged from recovery room within one hour. Appropriate post operative analgesia and care assured the comfort of the patient. The patient was discharged from the hospital next day.

Figure 1

Fig. 1- Picture showing the nasal preformed endotracheal tube after removal and slitting the distal part showing the tip of impacted suction catheter [Size 4.5 un-cuffed naso-tracheal preformed tube Mallinckrodt Ireland]



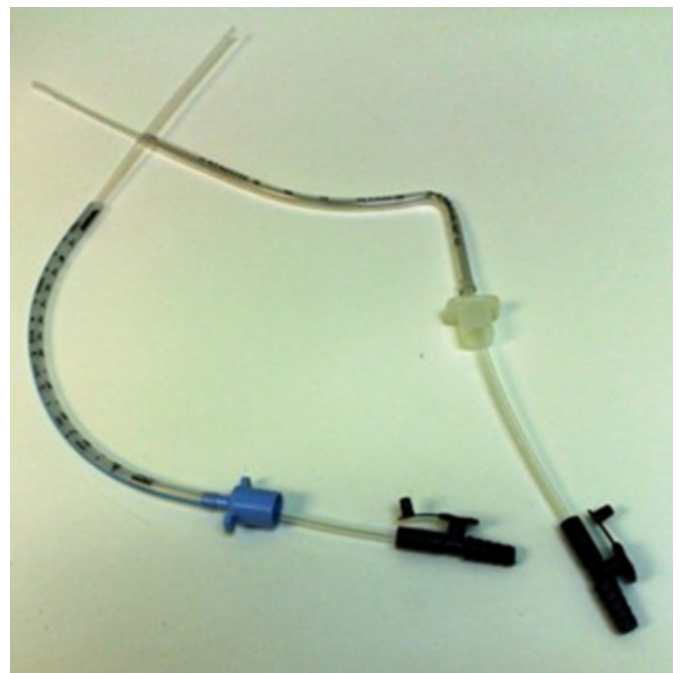
DISCUSSION

Dental surgery usually is performed under nerve block and most of surgeries would be done without undue difficulties. Some procedures are carried out under general anesthesia (GA) in some adults and children particularly because they do not cooperate during dental care procedures either due to extreme young age or retarded mental development. Administering GA is governed by mutual understanding, on the use of 'shared airway' between dental surgeon and anesthesiologist to conduct a safe and successful surgery. The choice of nasal airway management technique is influenced by patient factors, surgical requirements and anesthetic preferences. The anesthetic considerations are related to dealing with the difficult airway, avoiding airway loss or obstruction intra-operatively. Other important factor is the risk of surgical soiling of the airway due to bleeding and surgical debris (tooth or bone fragments). The airway management should cover as well the post operative period. The use of a cuffed (or un-cuffed) nasal tracheal tube with a throat pack provides the standard secured care of airway protection in shared airway surgery. It provides an excellent surgical access to the teeth, oral cavity, jaws and neck. In this report we describe an incidental SC impaction after inserting PNETT, the SC needed to clear chest secretions before surgery. On trial of removing SC. it was cut into two parts one exited and the other impacted. We adopted the

choice of immediate replacement of PNETT and see the fate of lost distal part of SC. It was recovered as it was impacted inside the preformed tube. Nasal tracheal tube was reinserted successfully. Chest was clear on re-auscultation and one hour dental conservative surgery was completed, the patient recovered uneventfully and discharged from the hospital next day. After terminating the procedure we examined the tubes and catheters of the same internal diameters (Fig. 2), we found the passage of the catheter inside preformed and regular ETT, smooth. On verifying SC measurement it was Fr. g. size 10 entering a PNETT No 4.5 which was selected for nasal intubation as estimated by child's nose size and it was inserted easily through the nasal route without trauma. According the age formula the child would accommodate ETT No 5. According to the formula used in our institution, SC size to be used is Fr. g. size 8.

Figure 2

Fig. 2- Picture showing the nasal preformed endotracheal tube and ordinary endotracheal tube accommodating the similar size to mentioned suction catheter No 10 Fr. g. [Mallinckrodt Ireland]] and slitting the distal part showing the tip of impacted suction catheter [Size 4.5 un-cuffed naso-tracheal preformed tube Mallinckrodt Ireland]



In conclusion; The incident may be iatrogenic in nature and could be prevented by selecting appropriate catheter measurement [as double the age in years and the tube as Age in years divided by 4 added to 4]. SC lubrication with water based lubrication may be appropriate. In case of difficulties in withdrawing SC, removing PNETT and re-intubation with

new one is safer and less time consuming.

On withdrawing SC gentle traction only should be allowed as remedy. Removal of the whole structure should be done and then replaced by new one.

The possible reason for impaction of SC may be either to the loss of the circular diameter of PNETT at the curved part of PNETT or distortion of the diameter of PFNETT inside nasal passage. This also can be related to storage conditions, SC may be as well have weak parts which can not tolerate force application.

The dire sequences would be migration distal part of the catheter into the trachea and retrieve it may necessitate bronchoscope maneuver.

ACKNOWLEDGEMENT

We would like to thank Mr Ibrahim al Rjoub and Mr. Assaf al Malki from anesthesia department for their help in

preparing this manuscript.

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