

Accidental rupture of the endotracheal tube guide (rigid mandrel) with endobronchial migration of the distal tip during the tracheal intubation procedure

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Abstract: Tracheal intubation is a technical procedure, frequently used in anesthesia, which involves inserting into the trachea through the glottic orifice a probe whose upper end emerges through the mouth (orotracheal intubation) or the nostril (nasotracheal intubation). It provides freedom and airway sealing and allows mechanical ventilation. Intubation is a well codified procedure. It is easily performed most of the time, but the occurrence of a complication remains possible during the procedure. We report here a case of accidental rupture of the endotracheal tube guide (rigid/short mandrel) with endobronchial migration during the orotracheal intubation procedure. The purpose of this presentation is to highlight the special attention that must be paid to the quality of intubation devices proposed in the management of difficult airways, including guides or mandrels that can be a source of atypical complications.

Keywords: Accidental rupture, rigid mandrel, tracheal intubation.

Introduction

Parkinson's disease is a chronic neurological Tracheal intubation is defined as the catheterisation of the trachea, through the glottis using a tube that remains accessible to the mouth or nostrils according to the chosen route of introduction [1]. It is a common gesture, easy and fast rule, often essential in anesthesia and emergency resuscitation, which allows to maintain the freedom and airtightness of the upper airways and to control ventilation and hematosis [1]. The devices proposed in the context of the management of the difficulties of control of the airways are multiple. Only a few devices have been studied in patients who had real intubation and/or ventilation difficulties [2]. Recently, single-use devices have appeared which for the moment has been the subject of very few evaluations [2]. The purpose of this presentation is to highlight the special attention that must be paid to the quality of intubation devices proposed in the management of difficult airways, including guides or mandrels that can be a source of atypical complications.

Case report

This is an 86-year-old patient weighing 65 Kg, with no previous contributory medical history. He was referred to the surgical consultation for occlusive syndrome on a digestive mass. The first clinical signs were one year old, marked by epigastric pain, a progressive deterioration of the general condition and a slight increase in the volume of the abdomen. The clinical examination revealed a peri-umbilical mass of firm consistency, moving on the superficial and deep plane. The mass was not pulsatile and there was no associated breath.

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The abdomino-pelvic CT concluded a 93 mm long gastric expansive process with fat infiltration and peri-gastric lymphadenopathy. The surgeon decided on a 4/5 gastrectomy.

The patient did not have difficult intubation criteria. Cardiological assessment was normal for age. The specific preparation concerned the correction of metabolic disorders before surgery. The patient was classified as grade II-A according to the "Cormack-Lehane classification revisited". The endotracheal tube guide (rigid mandrel) was inserted into the intubation probe Number 7.5 (internal diameter of the intubation probe) for the pre-form. The insertion of the intubation probe into the trachea was done without any difficulty. Removal of the rigid mandrel from the intubation tube after intubation of the trachea revealed a very short mandrel (figure1). This suggested that the distal tip had remained in the trachea.

Emergency bronchoscopy showed an endobronchial metallic foreign body (figure2). Extraction of the distal tip of the rigid mandrel was performed using a rigid bronchoscope. After removal of the foreign metal body, the patient was reintubated. The duration of the intervention was 7 hours. The procedure was well tolerated by the patient. The awakening was delayed in intensive care unit. The immediate operative follow-ups were simple. The patient was transferred to surgery at the 24th hour post-operatively for the continuation of the management.

Discussion

Airway management is a fundamental aspect of anaesthetic practice and of emergency and critical care medicine. Endotracheal intubation is a rapid, simple, safe and non surgical technique that achieves all the goals of airway management, namely, maintains airway patency, protects the lungs from aspiration and permits leak free ventilation during mechanical ventilation, and remains the gold standard procedure for airway management [1,3].

Many complications can occur during the tracheal intubation procedure [3, 4, 5]. A wide range of devices have been developed to aid in the management of the difficult airway. They incorporate a variety of fiberoptic, video, optical, and mechanical technologies to enable the operator to obtain a better view of the larynx and facilitate passage of an endotracheal tube into the trachea. Endotracheal tube guide (rigid mandrel) help the anaesthesiologist in securing the airway during an unanticipated difficult intubation. These devices are useful for management of the difficult or failed airway and for routine intubation [5]. The advent of the new tools makes very modest the use of endotracheal tube introducer like rigid mandrel in developed countries. Its use is still widespread in the operating rooms of African countries, even when intubation is not expected to be difficult.

The endobronchial migration of the rigid mandrel remains a rare complication and very little described in the literature. In our observation, we note a major fact, the lack of verification of the quality of the rigid mandrel during the verification process of the World Health Organisation (WHO) checklist. The rate of morbidity and anesthetic mortality in emerging countries remains high [6]. Mortality from anesthesia and surgery in many countries in sub-Saharan Africa has not yet reached the levels seen in high-income countries 70 years ago [6].

On this subject the WHO suggests the use of a checklist model in operation rooms for greater anesthetic and surgical safety. The WHO launched the "Safe Surgery Saves Lives" campaign in 2007. This program included the design and implementation of the "Surgical Safety Checklist", which includes ten essential goals for safe surgery [6].

This study which was conducted on references hospital of East African shows that out of a population of 85 anesthetists surveyed, only 25% regularly used the WHO surgeries checklist before opening of the operating room. The conclusion of this study was that the checklist remains underutilised in emerging countries.

Contribution of the authors

All authors contributed to the realisation of typescript.
All authors contributed to the behaviour of this job.
All authors also declare to have read and approved the finished version of the typescript.

In our observation, the verification of the checklist was carried out before the opening of the operating room by the nurse anesthetist and the anesthesiologist. The principle of checking the checklist at the Essos Hospital Center is essentially based on the presence or absence of material and its functionality. Special attention is not paid to the quality of the material available. The lack of methodical and objective verification of the WHO checklist focused on the operation of the equipment led to a serious accident, fortunately without any damage to our patient, the rupture of the endotracheal tube guide with migration of the distal tip into the right bronchus strain.

Conclusion

Tracheal intubation is defined as the catheterisation of the trachea, through the glottis using a tube that remains accessible to the mouth or nostrils according to the chosen route of introduction [1]. Like any invasive medical procedure, it can have complications related to this procedure. The tracheal tube introducer, a simple and inexpensive device, first described by Macintosh in 1949, is used to facilitate orotracheal intubation [7, 8, 9]. The rupture of the rigid mandrel is a rare, but possible complication of tracheal intubation.

Endobronchial migration of the distal tip is the most immediate complication. Bronchoscopy is necessary for extraction of the endobronchial foreign body. It is therefore important to check the rigid mandrel correctly before and after each orotracheal intubation procedure. Prevention requires a better use of the checklist, a guarantee of patient safety in the operating room.

Conflicts of interests: The authors declare no conflict of interests

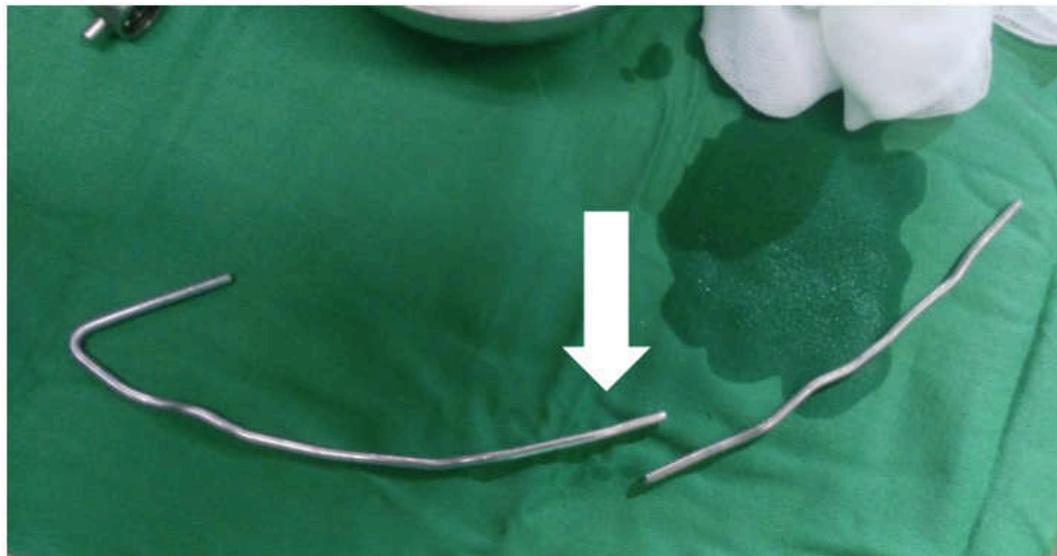


Figure 1 : Broken rigid mandrel after tracheal intubation

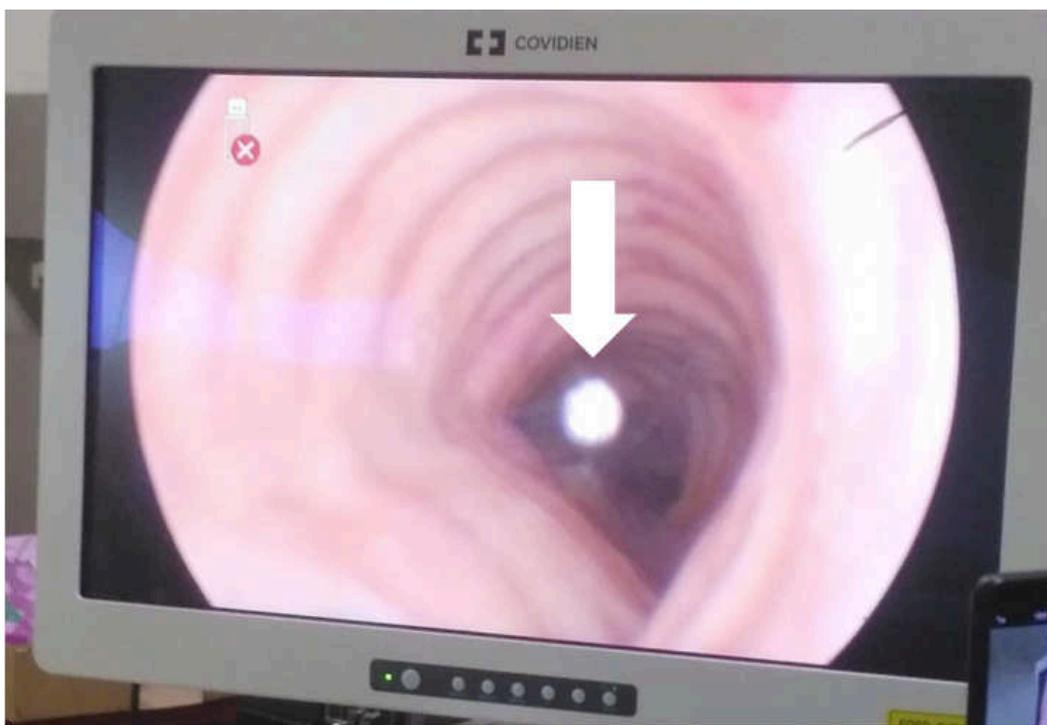


Figure2 : Endobronchial metallic foreign body

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