Inadvertent Entry Of A Guide Wire Through The Murphy's Eye Causing Difficulty In Passing A Percutaneous Tracheostomy Tube With Seldinger Technique: A Case Report

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Citation

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Abstract

Most complications of percutaneous tracheostomy are caused by failure to cannulate the trachea and injury to the surrounding structures. This procedure has been performed with or without bronchoscope assistance. We report a case of difficult percutaneous tracheostomy without assistance of a bronchoscope in which a J-tipped guide wire entered into the endotracheal tube through the Murphy's eye and caused difficulty in passing tracheostomy tube.

INTRODUCTION

Tracheostomy is a common surgical procedure performed on critically ill intensive care patients. Minimally invasive procedures are rapidly transforming many areas of surgical practice. Percutaneous tracheostomy is one of them increasingly performed as bedside technique using Seldinger technique.

CASE REPORT

A 72 year old male, weighing 65 kilograms was scheduled electively for percutaneous tracheostomy to facilitate weaning from positive pressure ventilation and sedation after failed trial of weaning and extubation. The patient had diabetes mellitus and iIschemic heart disease. He had undergone Coronary Artery Bypass Grafting (CABG) 14 days ago.

Percutaneous tracheostomy was performed with a Portex Percutaneous Blue Line Ultra Tracheostomy Kit (SIMS Portex Limited, Hythe, Kent CT21 6JL,UK) in the Cardiac Intensive Care Unit at the bedside under standard monitoring care. Consent was taken and signed. Supplemental sedation and analgesia was given and FiO_2 increased to 100% and 30 mg of rocuronium was administered as well. Before the procedure the patient was positioned supine with a pillow to support the neck and shoulders in order to hyperextend the neck. The anatomical landmarks were identified and marked. The skin was disinfected and sterile drapes were applied.

At this stage direct laryngoscopy was performed, pharynx suctioned and the endotracheal tube withdrawn to the laryngeal inlet. Local infiltration was done using 4ml of 2% Xylocaine with adrenaline. The needle and cannula attached with a syringe was inserted in a caudal direction between 2nd and 3rd tracheal rings. The placement of needle was confirmed by free aspiration of air. The cannula was left in place and the needle with the syringe withdrawn. Free air was aspirated again to re-confirm the placement of cannula into the tracheal lumen. A flexible J-tipped guide wire was inserted trough the cannula. Free movement of the guide wire was checked and approximately 10 centimeters of its length was left in trachea and the cannula was removed. A transverse one-centimeter skin incision was made at the entry site of the guide wire. A dilator was passed over the guide wire through the soft tissues of the neck into the trachea. The tract was then dilated with the Guidewire Dilating Forceps (GWDF). The tracheostomy tube with obturator was threaded over the guide wire into the trachea but we failed to do so.

The obturator and tracheostomy tube were removed from the guide wire assuming that the tracheal stoma was under-dilated. The tract was then again dilated with the help of Guide Wire Dilating Forceps and we failed to pass obturator and tracheostomy tube over the guide wire again. The

procedure was stopped for a moment assuming that endotracheal tube is interfering so direct laryngoscopy was performed. The endotracheal tube was in its proper place i.e. the cuff still situated at the vocal cords level. However, it was withdrawn a little bit more. It was then realized that the guide wire had entered into the lumen of endotracheal tube thus moved retrogradely through the Murphy's eye. A simulated picture is shown below in the figure.

Figure 1

Figure 1: This is showing the entry of guide wire through the Murphy's eye into the lumen of endotracheal tube. It moved in retrograde fashion and was found in the hypopharynx. The inflated balloon of endotracheal tube is sitting right over the vocal cords (red). The right lateral wall of trachea is exposed to show the inside structures.

We tried to pull the guide wire gently from above but could not succeed. Thus, it was removed with the obturator and tracheostomy tube as a complete assembly. Because the stoma was well formed, the tracheostomy tube was passed with the obturator without any difficulty. Placement of the tracheostomy tube was confirmed by manual ventilation. Post-tracheostomy X-ray chest showed its normal location without any complication. The patient was successfully weaned off the ventilator and sedation after 72 hours.

DISCUSSION

The Murphy's eye is a side hole between the cuff and the tip of the endotracheal tube. It was introduced in the early 1940's by FJ Murphy[1] to avoid complete endotracheal tube obstruction by mucus plugs. Fiberoptic bronchoscopes,[2,3] tube changers,[4,5] curved tip catheters[6] and one arm of forceps[7] has been reported in the literature inadvertently entered through the Murphy's eye and caused difficulties with the procedures.

Toye and Weinstein [8] first described percutaneous tracheostomy in 1969. Two relatively new methods suitable for elective tracheostomy have been introduced based on Seldinger technique. The first method developed by Ciaglia et al [9] in 1985, uses graded dilators and the second by Griggs et al [10] uses one stage dilation technique using a modified Howard – Kelly Forceps as tracheal dilator. This technique has been described with [11] or without [12] the assistance of a bronchoscope. Whatever the technique may be, the fundamental step is the proper placement of the needle into the tracheal lumen followed by a guide wire towards the tracheal carina. The bronchoscope interferes with the ventilation and the endotracheal tube placed at laryngeal inlet may come out and become dislodged easily. Video Bronchoscopy would have helped us to see the guide wire placement if it has entered the Murphy‘s eye moving retrogradely. The guide wire became acutely kinked at the distal point and the obturator (because it went retrogradely with the endotracheal tube) Thus, it was difficult to pull the guide wire from the tracheostomy tube. But when the whole assembly was pulled out the guide wire came out without any difficulty and the tracheostomy tube sized 8.0 mm ID entered the stoma without difficultly and any subsequent complication.

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