Do we need bronchoscopy during percutaneous tracheostomy?

Sir,

Percutaneous tracheostomy (PCT) is a standard procedure in many Intensive Care Units (ICUs). It is considered as a safe procedure over open conventional tracheostomy.[1] It has several complications some of which could be life threatening. Recently, many studies have supported the view of performing PCT without fiberoptic bronchoscopy control.[2] However, in our case, during PCT, a serious complication was diagnosed because of the use of bronchoscopy.

A 25-year-old male who underwent multiple surgeries during his 5 months stay at our hospital was admitted to our ICU in view of sepsis and acute respiratory distress syndrome. On the 10th day of intubation in view of ongoing ventilatory

requirement and prolonged respiratory support elective PCT was planned. PCT was performed by an anaesthesiologist having experience of performing more than 50 PCTs using the 'Cook Medical® Ciaglia Blue Rhino TM, kit. There was no contraindication of PCT and patient had easily palpable anatomy. The patient was sedated and paralyzed using fentanyl, propofol, and rocuronium. The pillow was inserted under the shoulder to permit full extension of head and neck. FiO_2 was increased to 1, and the positive end-expiratory pressure was reduced to 0 mmHg. Tracheal cartilages C2-C3 were identified under ultrasound guidance. After giving local anesthesia with 2% lignocaine and adrenaline, a 1.5 cm vertical incision was made between 2nd and 3rd tracheal ring. Anterior tracheal muscles were separated, the front of trachea was bluntly dissected and cartilages were felt.

The endotracheal tube was deflated and withdrawn, and the cuff was inflated at the level of cords. Bronchoscopy was done, and the site of desired tracheal level was identified by transillumination and then withdrawn above to visualize the procedure. After the identification of tracheal lumen by the introducer needle, J wire guide was introduced freely into the trachea under bronchoscopic vision. The tracheal insertion site was then dilated with 14 F pre tracheal dilator over the guide wire followed by Blue Rhino dilator that passed in the tracheal lumen by the use of optimal force. The tracheostomy tube (mounted on the loader) was then passed over the guidewire and stylet kept *in situ*. Slight resistance was felt while inserting the tracheostomy tube through the stoma, which was overcome by using a little force. The tracheostomy tube was inserted, and loader removed. The bronchoscopic view showed rupture of anterior tracheal ring cartilage and herniation above the tracheostomy tube around the stoma, occluding about 30% of tracheal lumen [Figure 1]. Bronchoscopy was done to confirm the correct placement of tracheostomy tube, any bleeding, or obstruction. Tracheostomy tube cuff was inflated and connected to ventilator without any further complication.

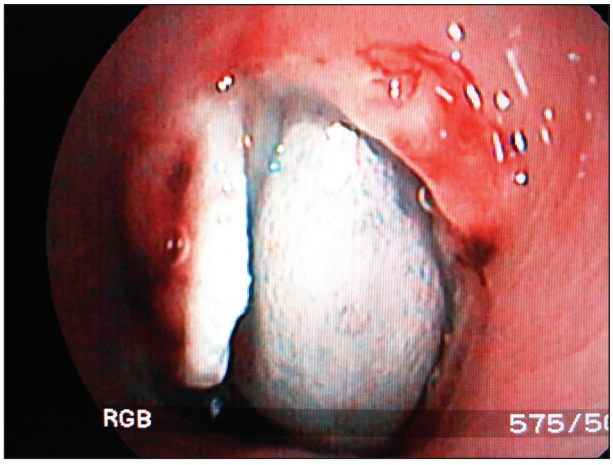

Figure 1: Bronchoscopic view showing anterior tracheal ring cartilage rupture and its herniation in tracheal lumen

Tracheal rupture and herniation in the tracheal lumen during PCT is not commonly diagnosed in real time. Most of the studies describe this complication on autopsy findings[3] or as a late presentation in the form of tracheal stenosis developing after decannulation.[4,5] In a study on 1000 bedside PCT, no incidence of tracheal rupture was found.[6]

The above case illustrates the major benefit of fiberoptic bronchoscopy in diagnosing the uncommon complication of cartilage fracture and herniation in real time thus avoiding the error of delayed diagnosis presenting as a late complication in form of tracheal stenosis. Some of the factors that may predispose to tracheal rupture are excessive force, coughing during insertion, difficult anatomy, and old age. However, they were not present in our case and we had applied optimal force during the procedure. We speculate the cause of tracheal injury in our patient might be malnutrition or tracheal ischemia due to long intubation history. Using bronchoscopy to guide PCT provides the advantage of visualizing and recording tracheal mucosal injury, bleeding and excludes passage of guidewire through Murphy eye of endotracheal tube or perforation of the posterior tracheal wall.[6] Although damage to the tracheal skeleton cannot be avoided by use of bronchoscope, however, it may help in early diagnosis of this complication and predict problems during decannulation.

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Conflicts of interest
There are no conflicts of interest.

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