Are New Airway Devices for Percutaneous Dilatational Tracheostomy Really Needed?

To the Editor:

I read with great interest the article by Vargas et al[1] regarding a double lumen endotracheal tube (DLET) for percutaneous dilatational tracheostomy (PDT). The authors present their version of a DLET device designed to permit continuous bronchoscopy during PDT while allowing for better gas exchange by removing the bronchoscope from inside the patient's endotracheal tube (ETT). The DLET potentially avoids complications such as tracheal tube malpositioning, needle puncture of the bronchoscope, and needle injury to the posterior tracheal wall. A few issues come to mind.

First, the use of continuous bronchoscopy during PDT itself has been called into question.[2,3] Despite the lack of any randomized controlled trials, proponents of continuous bronchoscopy claim that it may prevent major complications[4] such as misplacement of the tracheostomy tube and posterior tracheal wall laceration. A retrospective review found no difference in PDT complications with or without bronchoscopy.[5] Only 50% of operators worldwide use bronchoscopy.[2,3] Large studies using either intermittent bronchoscopy or no bronchoscopy at all during PDT have shown very low complication rates, very low mortality, and high success rates even in high-risk subjects.[6,7] In light of current evidence, intermittent bronchoscopy is safe and will minimize the impairment to gas exchange while allowing visualization of the most important procedural steps (ie, needle insertion and dilatation). Thus, a DLET is not needed.

Second, the major dreaded complication of PDT is bleeding.[5] Pre-procedural ultrasound examination of the neck decreases bleeding complications, whereas a DLET does not address this issue. Thus, even with a DLET, a pre-procedural ultrasound exam should be performed. If ultrasound is available, why not use real-time ultrasound guidance for placement of the needle and guide wire?[8] This will satisfy those practitioners uncomfortable with lack of (bronchoscopy) visualization during needle and guide-wire insertion. Posterior wall puncture is avoided in ultrasound-guided PDT by visualizing the direct progression of the needle into the trachea and by the ability to measure the depth needed for insertion. Ultrasound guidance allows midline placement in the intended tracheal space with a high degree of accuracy, usually in the first stick.[8] Bronchoscope puncture and ventilation impairment are not issues with this technique. Thus, a DLET is not needed.

Third, use of a pediatric bronchoscope with a regular ETT should also be tested against a DLET, as this simple step may eliminate the need for the DLET. Concerns regarding the effectiveness of the pediatric bronchoscope in clearing secretions are unfounded, as many studies have used pediatric bronchoscopes in appropriate subjects without problems.[9]

Finally, a DLET is designed to allow better gas exchange during PDT, thus making it possible to perform PDT on sicker patients with higher oxygen and PEEP demands. However, will such patients tolerate the complete absence of ventilation during the tube-exchange procedure required to place the DLET? A possible solution for this dilemma is provided in my 2011 report,[9] which was the first in vitro study involving a DLET for PDT (the Easy Tracheostomy [EZT]): "It is possible to design a variant of the EZT with just a viewing tube. This tube would slide over the patient's existing ETT and, after optimal positioning, it would be possible to secure it in place with a locking mechanism. This would eliminate the need for any airway exchange." The proximal fixating balloon in the final version of my DLET device could serve as this locking mechanism. However, I feel that this improvement to the DLET will still not overcome the other limitations, and therefore, the practical use of a DLET remains in question. The current PDT technique is extremely safe,[2-7] and the potential hazardous complications discussed by Vargas et al[1] can be avoided by better training in current PDT procedure and use of ultrasound rather than introduction of a new device.

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Dr Sangwan has disclosed no conflicts of interest.

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