



Is Percutaneous Dilatational Tracheostomy Safe to Perform in the Intensive Care Unit?

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Percutaneous dilatational tracheostomy (PDT) is a commonly performed procedure in patients with respiratory failure. Its safety was compared with that of surgical tracheostomy at home and abroad. In Korea, Moon et al.[1] revealed the results skewed toward PDT in 1994 after comparing the two procedures. However, PDT had not been actively performed in local clinical contexts due to various reasons such as insurance coverage. In 2009, the Ministry of Health, Welfare and Family Affairs officially recognized PDT as a new surgical procedure. Since then, clinical applications of PDT have gradually increased even in the intensive care unit (ICU).[2] The present journal includes a study whether there were differences in procedure time and complications between PDT performed by trainees subspecializing in critical care medicine (CCM) and intensivist-led PDT. But no differences were found.[3]

In many studies, PDT has been shown to be safe and effective as conventional surgical tracheostomy (CST) in patients with normal airway anatomy. Bleeding, one of the major complications of PDT, occurred in 7% to 24% of patients, and mortality was less than 1% in patients with bleeding complications.[4-9] Their study found bleeding complications in 3.1% of patients in the trainee-led PDT group and 2.2% in the intensivist-led PDT group, showing no significant difference. Additional approach such as preoperative ultrasound therapy or intraoperative bronchoscopic guidance may lower the incidence of PDT-related complications, although their effectiveness is still controversial in the absence of enough evidence.[10] However, these assisting procedures are likely useful to perform for better safety when physicians do not have enough experience to feel comfortable with PDT procedure. The safety of tracheostomy is affected by technical factors related to the procedure and surgical skills. And PDT can be simpler to perform for physicians with non-surgical specialty, compared with CST. In fact, residents in otorhinolaryngology demonstrated shorter procedure time and less complications when performing PDT, compared their performance with CST.[11] In previous study, they reported that PDT was a safe and feasible procedure to be performed by trainees in CCM with non-surgical specialty.[2] Our assertion was based on the fact that trainees participating in the subspecialty training program of CCM have their own specialty, which are as varied as internal medicine, surgery, anesthesia, etc. Most trainees have enough clinical and surgical experiences; they are well prepared to perform PDT after a short-term training backed by video simulation and participating in actual operations.

Tracheostomy is conducted in either surgical department or otorhinolaryngologic department when it is performed by surgeons, causing some limitations such as time consuming and transport of ICU patients. However, ICU patients can have PDT in a more timely manner when it is performed by ICU physicians because there is no problem in locating an anatomical landmark. As mentioned above, the proficiency of physicians is important to ensure the safety and effectiveness of PDT. Therefore, effective training programs should be developed and implemented to assist trainees in obtaining sufficient anatomical knowledge and technical skills.

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REFERENCES

- 1) Moon JS, Cho YN, Shin KM, Hong SY, Choi YR, Ahn MS: Percutaneous tracheostomy: a comparison with standard surgical tracheostomy. *Korean J Anesthesiol* 1994; 27: 1795-800.
- 2) Yoo H, Lim SY, Park CM, Suh GY, Jeon K: Safety and feasibility of percutaneous tracheostomy performed by medical intensivists. *Korean J Crit Care Med* 2011; 26: 261-6.
- 3) Lee D, Chung CR, Park SB, Ryu JA, Cho J, Yang JH, et al: Safety and feasibility of percutaneous dilatational tracheostomy performed by intensive care. *Korean J Crit Care Med* 2014; 29: 64-9.
- 4) Antonelli M, Michetti V, Di Palma A, Conti G, Pennisi MA, Arcangeli A, et al: Percutaneous translaryngeal versus surgical tracheostomy: A randomized trial with 1-yr double-blind follow-up. *Crit Care Med* 2005; 33: 1015-20.
- 5) Heikkinen M, Aarnio P, Hannukainen J: Percutaneous dilatational tracheostomy or conventional surgical tracheostomy? *Crit Care Med* 2000; 28: 1399-402.
- 6) Holdgaard HO, Pedersen J, Jensen RH, Outzen KE, Midtgaard T, Johansen LV, et al: Percutaneous dilatational tracheostomy versus conventional surgical tracheostomy. A clinical randomised study. *Acta Anaesthesiol Scand* 1998; 42: 545-50.
- 7) Massick DD, Yao S, Powell DM, Griesen D, Hobgood T, Allen JN, et al: Bedside tracheostomy in the intensive care unit: a prospective randomized trial comparing open surgical tracheostomy with endoscopically guided percutaneous dilatational tracheotomy. *Laryngoscope* 2001; 111: 494-500.
- 8) Silvester W, Goldsmith D, Uchino S, Bellomo R, Knight S, Seevanayagam S, et al: Percutaneous versus surgical tracheostomy: A randomized controlled study with long-term follow-up. *Crit Care Med* 2006; 34: 2145-52.
- 9) Tabae A, Geng E, Lin J, Kakoullis S, McDonald B, Rodriguez H, et al: Impact of neck length on the safety of percutaneous and surgical tracheotomy: a prospective, randomized study. *Laryngoscope* 2005; 115: 1685-90.
- 10) Dennis BM, Eckert MJ, Gunter OL, Morris JA, Jr, May AK: Safety of bedside percutaneous tracheostomy in the critically ill: evaluation of more than 3,000 procedures. *J Am Coll Surg* 2013; 216: 858-65; discussion 865-7.
- 11) Donaldson DR, Emami AJ, Wax MK: Endoscopically monitored percutaneous dilatational tracheotomy in a residency program. *Laryngoscope* 2000; 110: 1142-6.