

## Vertical Incision to Prevent Vascular Injury during Percutaneous Dilational Tracheostomy: A Case Report

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### Abstract

**Introduction:** Percutaneous dilational tracheostomy (PDT) is known as a common surgical procedure in critical care units. Pre-procedure ultrasonic study may be useful for the assessment of regional arteries and veins, in order to prevent intraoperative and postoperative surgical bleeding, which may be injured with transverse incision.

**Case Description:** We performed PDT under general anesthesia without the use of any relaxant (to keep spontaneous breathing during surgery) through a 2 cm midline vertical incision. During dissection, care was taken to not damage the surrounding tissues, especially the above-mentioned vessels. Fortunately, no bleeding occurred during procedure. In the postoperative days, no complications were observed, including bleeding at the operation site.

**Conclusion:** Ultrasonographic study before tracheostomy is a useful method to assess the vascular structures around the field. A vertical skin incision may be a suitable method, as needed to avoid vascular injury.

**Keywords:** Percutaneous Dilational Tracheostomy (PDT); Ultrasonic Study; Surgical Bleeding; Transverse Incision

### Introduction

Percutaneous dilational tracheostomy (PDT) is known as a common surgical procedure in critical care units. In this regard, about 10% of patients with prolonged mechanical ventilation and 1.3% of all critically ill patients underwent tracheostomy [1]. All tracheostomy methods would be developed with some complications in 38.6% of cases, which consequently lead to about 2% mortality rate [2,3]. Having knowledge about neck anatomy, especially vasculature, is essential to avoid complications such as intraoperative and postoperative surgical bleedings [4,5].

Pre-procedure ultrasonic study may be useful for the assessment of regional arteries and veins, in order to prevent hemorrhage [6]. Transverse skin incision also is a classic method to approach the trachea, but vertical incision is considered as a substitution method. A retrospective study showed that transverse skin incisions in PDT in critically ill patients would result in a significant decrease in their overall complications, particularly ulcers at the tracheostomy site [7]. In this study, we presented an interesting case of PDT via vertical incision to avoid vascular injury.

### Case Study and Discussion

The patient was a 67-year-old man, a case of falling down, with the developed subdural hematoma (SDH), rib fracture, lung contusion, and femur fracture, who underwent craniotomy due to SDH. Because of the low level of consciousness (GCS=6) and his inability to wean

from mechanical ventilation, he was recognized as a candidate for percutaneous dilational tracheostomy after 14 days of intubation. Based on our policy, at first, we performed an ultrasonographic study of the neck before performing PDT for the evaluation of thyroid gland and regional vessels. Notably, at the site of the planned surgical incision, between the second and third tracheal rings, there were 7 vessels with different diameters (Figure 1 and 2), which may be injured due to transverse incision, which caused bleeding. So, we decided to perform PDT in operation room to use electro-cautery and surgical facilities if bleeding occurred and also decided to cut the skin vertically.

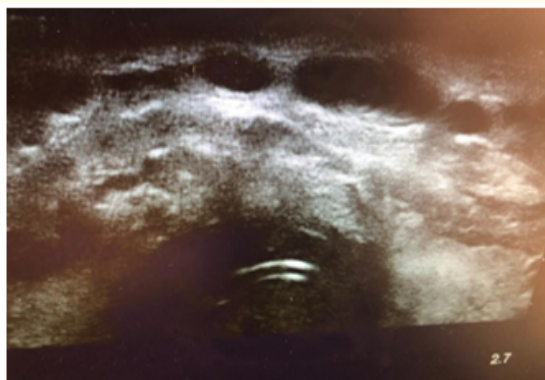


Figure 1: Ultrasonographic view of pretracheal region.



Figure 2: Gross vascular component in pretracheal region.

After obtaining an informed consent from the patient’s family, complete preparation, and controlling the patient’s coagulation tests, the patient was placed in the supine position. Thereafter, we placed a roll under the patient’s shoulders to extent the neck. The endotracheal tube was pulled out to be located as far as possible from the tracheostomy site, and then it was fixed at 18 cm. The patient’s skin was disinfected from nipple to the chin with 10% povidone iodine solution. Afterward, Drape was performed all over the patient’s body from the fingertips to the head as fashion. Surgery was also started under general anesthesia using midazolam, fentanyl, and propofol, without the use of any relaxant (to keep spontaneous breathing during surgery) and we then infiltrated 3 ml of 2% lidocaine at the incision site. A

2 cm midline vertical incision was made along with the second and third rings of the trachea. Subsequently, the subcutaneous tissues were dissected by a fine curved clamp until reaching the trachea. During dissection, care was taken to not damage the surrounding tissues, especially the above-mentioned vessels. Fortunately, no bleeding occurred, PDT steps were performed accurately, and a tracheostomy tube was then inserted into the trachea and connected to the ventilator. After ensuring the correct placement of the tracheostomy tube with capnograph, the patient's endotracheal tube was removed. Finally, the tracheostomy tube was fixed with a 2/0 nylon suture.

In the postoperative days, no complications were observed, including bleeding at the operation site.

### Conclusion

Ultrasonographic study before tracheostomy is a useful method to assess the vascular structures around the field. A vertical skin incision may be a suitable treatment, as needed to avoid vascular injury.

### Disclosure

The author report no conflict of interests or sources of support to declare.

### Authors Contribution

The authors are responsible for the content and writing of this article.

### Bibliography

1. Fischler L., *et al.* "Prevalence of tracheostomy in ICU patients. A nation-wide survey in Switzerland". *Intensive Care Medicine* 26 (2000): 1428-1433.
2. Gilyoma JM., *et al.* "Ten-year experiences with tracheostomy at a University Teaching Hospital in North Western Tanzania: a retrospective review of 214 cases". *World Journal of Emergency Surgery* 6 (2011): 38.
3. Onakoya PA., *et al.* "Complications of classical tracheostomy and management". *Tropical Doctor* 33 (2003): 148-150.
4. Maruti Pol M., *et al.* "Innominate artery injury: a catastrophic complication of tracheostomy, operative procedure revisited Manjunath Maruti Pol". *BMJ Case Reports* (2014).
5. Emil J Kohan and Garrett A Wirth. "Anatomy of the Neck". *Clinics in Plastic Surgery* 41 (2014): 1-6.
6. Mehta C and Mehta Y. "Percutaneous tracheostomy". *Annals of Cardiac Anaesthesia* 20 (2017): S19-25.
7. Sung Yoon Lim., *et al.* "Comparison of outcomes between vertical and transverse skin incisions in percutaneous tracheostomy for critically ill patients: a retrospective cohort study". *Critical Care* 22 (2018): 246.

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