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Ultrasound guided percutaneous dilatational tracheostomy using needle guidance technology (eZGuide)

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Abstract

Tracheostomy has become routine procedure performed in Intensive Care Units (ICU). Nowadays it is performed ≤ 10 days (early PDT) or > 10 days (late PDT) of mechanical ventilation. It has many advantages over endotracheal tube: 1) reduction in sedation requirements, 2) facilitation of weaning from respirator, 3) help in bronchial secretions clearing and bronchial tree toilet, 4) VAP (Ventilator-associated pneumonia) prevention to name a few. Due to the fact that it is often done in borderline patients verging on the cardiopulmonary collapse strict adherence to specific procedure indications and contraindications must be observed. Both classic and percutaneous tracheostomy (PT) are associated with the risk of potentially fatal complications such as loss of airway patency, bleeding, infection, mediastinothorax or pneumothorax, tracheomalacia, damage to the posterior tracheal wall with or without esophagus puncture. Comparing with classical method, PT is associated with lower risk of bleeding, tracheal stenosis and infectious complications but carries higher risk of mischoosing entry point, misplacement of tracheostomy tube either subcutaneously and further into mediastinum or even into esophagus through damaging of posterior tracheal wall with all its consequences. Although bronchoscopy guided PT can help to reduce the risk of puncturing the posterior tracheal wall, increasing to certain extend overall safety of the procedure itself, it is not helpful in identifying pretracheal anatomy with its unpredictable vascularity, thyroid gland extend or tracheal rings level and thus does not reduce the risk of bleeding or mischoosing entry point. Ultrasound imaging on the other hand can help to evaluate pretracheal anatomy delineating out thyroid gland, tracheal rings, vascular course and thus to reduce the risk of bleeding as well as to determinate the appropriate level of the insertion of tracheostomy. It seems then that combining bronchoscopy and ultrasound into so called dual guidance technique during performing PT can ensure uppermost safety of the procedure and should be the method of choice. *Anestezjologia i Ratownictwo 2018; 12: 402-406.*

Keywords: percutaneous dilatational tracheostomy, ultrasound imaging, needle guidance technology