

Poster Presentations

LEARNING CURVE AND PERIOPERATIVE COMPLICATIONS WITH FOUR DIFFERENT PERCUTANEOUS TRACHEOSTOMY TECHNIQUES

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Background: Percutaneous tracheostomy (PT) in intensive care medicine has been established as a safe technique with only a few complications. Nevertheless, serious complications like major bleeding, posterior tracheal wall perforation, and even death still occur. Massick and co-workers demonstrated that the risk for complications associated with the basic Ciaglia technique of PDT was highly increased during the personal learning curve (1). Learning curves for other PT techniques have not been quantified yet. We therefore evaluated risks and complications of four different PT techniques depending on a learning curve.

Methods: A total of 200 adult patients of our intensive care units who underwent elective PT were studied. Tracheostomy was performed at the patient's bedside and under bronchoscopic control, either according to the techniques of Ciaglia (PDT, n=50, and Blue Rhino, n=50), Griggs (GWDF, n=50), or Fantoni (TLT, n=50). To evaluate a learning curve, each group was further subdivided in two groups (A: patients # 1-25, B: patients # 26-50). All tracheostomies were performed by the same team that was not previously familiar with the respective technique. According to Dulguerov and co-workers (2), perioperative complications were divided into major (life-threatening, emergency intervention required), intermediate (no increased morbidity after adequate treatment) and minor groupings.

Results: There were no statistically significant differences between the four main groups in terms of demographic data, tracheostomy timing, and underlying diseases. Two major complications occurred with the PDT technique (subgroup A: posterior tracheal wall injury requiring surgical repair) and with the GWDF technique (subgroup B: major bleeding requiring transfusion). Intermediate complications (n=12) occurred primarily in the respective B-subgroups (n=9, P: not significant), while minor complications (n=23) were significantly more likely to occur in the A-subgroups (n=18, P<0.05 vs. B-subgroups). The majority of minor complications were tracheal cartilage ring fractures (n=12) and minor bleeding episodes (n=6).

Conclusions: PT is an accepted alternative to the open surgical technique because of its technically easy and fast performance and the low rate of severe perioperative complications. Nevertheless, major complications may also occur with PT, regardless of personal experience. We attribute the higher incidence of intermediate complications after completion of the learning curve to the circumstance, that an experienced operator takes a higher risk to perform PT, for example in patients with relative contraindications. On the other hand, experience and routine might lower the grade of perioperative complications, so that major complications during this study were exceptional.

References:

1. Massick DD, et al., *Laryngoscope* 2000;110:222-228
2. Dulguerov P, et al. *Crit Care Med* 1999;27:1617-1625