



Tracheotomy When and Where?

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Eckart Klemm and Andreas Nowak

1.1 Tracheotomy When?

In a meta-analysis, Griffiths et al. [1] found that out of 15,950 reports on tracheotomies only five studies were useful to answer the question of the optimal time for a tracheotomy. They recommended an early tracheotomy within the first 7 days, whereby the total duration of ventilation can be reduced.

Gründling and Quintel [2] recommend performing a tracheotomy as early as possible if the expected duration of ventilation is more than 21 days; long-term intubation is preferred if the expected duration of ventilation is up to 10 days. Koscielny and Guntinas-Lichius [3] also vote for a tracheotomy if the ventilation duration is expected to take between 10 and 21 days.

Under the aspect of ventilator-related pneumonia and after a randomized controlled multicenter study, Terragni et al. [4] concluded that early tracheotomy after 6–8 days has no significant advantages compared to late tracheotomy after 13–15 days, whereas one third of patients suffered from PDT (percutaneous dilational tracheotomy) complications, which is why fewer tracheotomies than necessary were found in later indications.

Reviews and statements bearing high-level evidence by ANZICS [5], Cheung et al. [6], Andriolo et al. [7] and Hosokawa et al. [8] indicate tendencies towards positive effects for some clinical pictures in connection with early tracheotomies up to the 10th day of ventilation. However, the general statement as to whether an early

E. Klemm

Klinik für Hals-Nasen-Ohren Heilkunde, Kopf- und Halschirurgie,
Plastische Operationen, Städtisches Klinikum Dresden, Dresden, Germany
e-mail: Eckart.Klemm@klinikum-dresden.de

A. Nowak (✉)

Klinik für Anästhesiologie und Intensivmedizin, Notfallmedizin und Schmerztherapie,
Städtisches Klinikum Dresden, Dresden, Germany
e-mail: Andreas.Nowak@klinikum-dresden.de

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tracheotomy is superior to a later tracheotomy is not possible after detailed research by Raimondi et al. [9]. A tracheotomy should not be performed if the patient is dying or active treatment is being withdrawn or in case of refusal by the patient and/or guardian [10].

As the adjuvant intervention “tracheotomy” is also subject to discussion under medical law, the following applies according to current scientific findings:

The timing of an elective tracheotomy remains an individual decision, deliberating the risks and prospects of success. The current data situation does not permit a uniform recommendation for an optimal time of performing a tracheotomy in long-term ventilated patients.

In the consensus statement of the ANZICS [5], it was formulated:

“The timing of tracheostomy is the prerogative of the intensivist, dictated by the patient’s clinical status.”

1.2 Tracheotomy Where?: The Anatomical Relevance

Earlier textbooks differentiated between high, medium and low tracheotomies. This classification with respect to the location of the thyroid gland is obsolete, as is the earlier general recommendation to tracheotomize 1 cm below the cricoid cartilage (Chap. 3 “Anatomy and topography in relation to tracheotomy”).

Too high tracheotomies lead to later tracheal stenoses, too low tracheotomies are a risk for lethal bleeding according to Klemm and Nowak [11] (Chap. 10 “Complications of tracheotomy and strategies to avoid them”).

The safest place for tracheotomy is between the second and fourth tracheal braces. The internal anatomy of the trachea and the external anatomy of the neck are of equal importance for correct localization.

1.3 Tracheotomy Where?: Intensive Care Unit (ICU) or Operating Theater

A survey conducted by Kluge et al. [12] in 513 ICUs showed that 86% of PDT are performed in ICUs and 72% of surgical tracheotomies are performed in operating theaters. A further survey by Vargas et al. [13] of ICUs in 59 countries with a total of 17,894 tracheotomies showed that 54% of PDT were performed between the 7th and 15th day, 74% of which were performed by intensivists. Fifty-nine percent of surgical tracheotomies were performed in an ICU and 16% in the operating room.

The question in which location a tracheotomy is to be performed can only be determined on the basis of the individual circumstances of the patient, the organizational possibilities on site and the complication density of methods.

Tracheotomies can be performed both in the operating room and in an ICU, provided that minimum personnel and technical standards are met, also to control complications.

The greater the multimorbidity, the more interdisciplinary the type and location of a tracheotomy should be determined solely on the basis of medical criteria.

1.4 Tracheotomy in Patients with Severe Acute Respiratory Syndrome (SARS) e.g. COVID-19

The indication for tracheostomy in patients with SARS, when and where should be made as an individual decision by the intensive care team and the ENT surgeons involved. When making this decision, the patient's prognosis, previous illnesses, current viral load, possible advantages of tracheostomy and the risk of infection of the medical staff must be considered. The treatment teams also have to adjust the right time for tracheostomy individually to the patient's situation and local conditions. Although in the available literature regarding the high viral load, tracheostomy is favored as late as possible, practical (workload), but also medical aspects favor an early tracheostomy. A general determination of the ideal period of the indication is currently not possible [14–16].

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