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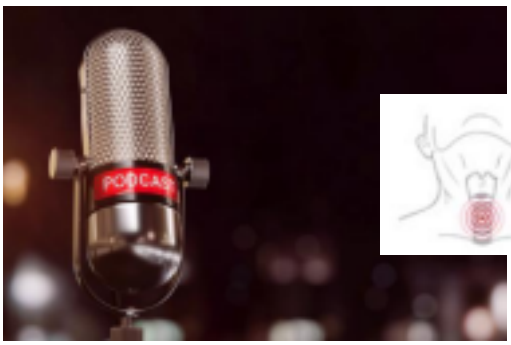

National Tracheostomy Safety Project

This month's top papers: June 2021

Welcome to the latest blog in the literature podcast from the NTSP. We try to bring you a quick roundup of what is hot in the world of tracheostomy and laryngectomy publications by scouring internationally recognised journals and media and bringing you the highlights.

The papers we will discuss this month are detailed below, along with an automated transcript of the podcast. Please note that the transcript is generated by AI and so may not be totally accurate.

You can find the links to the podcast on www.tracheostomy.org.uk and by searching for NTSP on your favourite podcast platform. Some of the podcasts are also uploaded to YouTube if you prefer to get your news that way. Check out the NTSP YouTube channel at https://www.youtube.com/c/NationalTracheostomySafetyProject. Please follow us and/or subscribe to keep up to date! https://x.com/NTSP_UK

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This month's top papers

- Tracheostomy Practices for Mechanically Ventilated Patients in Malawi.
- Early tracheostomy for managing ICU capacity during the COVID-19 outbreak: a propensity-matched cohort study.
- Laryngeal complications after tracheal intubation and tracheostomy.

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Tracheostomy Practices for Mechanically Ventilated Patients in Malawi.

Lay Summary:

This study looked at how tracheostomies are used for critically ill patients in a hospital in Malawi, a low-income country in Africa. A tracheostomy is a surgical procedure that creates an opening in the neck to insert a tube that helps a patient breathe, especially when they need long-term use of a breathing machine (mechanical ventilation).

The study followed 451 patients and found that 12% of those who needed mechanical ventilation received a tracheostomy. The average time a patient was on a breathing machine before getting a tracheostomy was about 9 days, which is in line with international standards. The overall hospital death rate was lower for patients who received a tracheostomy (40%) compared to those who did not (63%). However, the researchers discovered that this difference was mostly due to the fact that many of the tracheostomy patients had a severe head injury. When they removed these patients from the analysis, the death rates were similar between the two groups. The study concludes that while tracheostomies are an important and well-utilized procedure in this hospital, more research is needed on how to manage patients who require long-term care, especially since there are no long-term care facilities in Malawi. This highlights the need for a focus on home-based tracheostomy care in such settings.

Summary for Healthcare Professionals:

This prospective cohort study investigates tracheostomy practices and hospital mortality outcomes in a tertiary hospital ICU in Malawi, a low- and middle-income country. The study included 451 mechanically ventilated patients, with 55 (12%) receiving an elective open surgical tracheostomy at the bedside. The mean duration of mechanical ventilation prior to tracheostomy was 9 days (SD 5), which aligns with international guidelines.

The unadjusted results showed that patients who received a tracheostomy had a lower hospital mortality rate (40%) compared to those who did not (63%). However, a subgroup analysis that excluded patients with severe head injuries revealed that this association was confounded by the presence of a severe head injury, a known predictor of both tracheostomy need and high mortality. In the non-head injury subgroup, there was no statistically significant difference in hospital mortality between those with and without a tracheostomy. The study highlights that in resource-limited settings, tracheostomies are often used to facilitate the transfer of patients from the ICU to a lower level of care, such as a high-dependency unit or general ward, to free up scarce ICU beds. The authors conclude that while tracheostomy is an essential surgery provided in this setting, a key challenge is the lack of long-term care facilities, which necessitates a focus on home tracheostomy care and training in resource-limited settings.

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Early tracheostomy for managing ICU capacity during the COVID-19 outbreak: a propensity-matched cohort study.

Lay Summary:

This study looked at the timing of tracheostomies for patients with severe COVID-19 to see how it affected both patient recovery and the availability of hospital resources during the pandemic's first wave. A tracheostomy is a procedure that helps a patient breathe, and the study's goal was to find the best time to perform it to free up ventilators and intensive care unit (ICU) beds.

The research found that performing a tracheostomy earlier—within 14 days of a patient being put on a ventilator—was better for both the patient and the hospital. Patients who received an early tracheostomy had more days free from a ventilator and more days free from an ICU bed compared to those who had the procedure later. This suggests that earlier tracheostomy can help hospitals manage their limited resources during overwhelming situations like a pandemic without increasing patient mortality. The authors suggest that performing the procedure within the first week of mechanical ventilation is particularly effective for improving ICU availability.

Summary for Healthcare Professionals:

This retrospective cohort study from 15 Spanish ICUs investigated the optimal timing of tracheostomy in 382 patients with COVID-19 pneumonia who underwent the procedure within 14 days of intubation. The primary objective was to evaluate the impact of tracheostomy timing on patient prognosis and ICU capacity using failure-free day outcomes.

The study used propensity score-matched cohorts to compare outcomes based on tracheostomy timing:

≤7 days vs. >7 days, 8-10 days vs. >10 days, and 11-14 days vs. >14 days. Results showed that earlier tracheostomy was consistently associated with a higher number of ventilator-free days (VFDs) and ICU- and hospital bed-free days (BFDs) at both 28 and 60 days. For example, the group with tracheostomy at

≤7 days had a median of 9 VFDs at 28 days compared to 3 days for the group with tracheostomy at >7 days. Importantly, the study found no significant difference in mortality rates between the early and late tracheostomy cohorts.

The authors conclude that early tracheostomy, particularly within the first week of intubation, can improve patient outcomes and alleviate the strain on critical care resources during viral pandemics and other high-volume situations. This benefit is primarily due to a reduction in the time patients require mechanical ventilation, which frees up ventilators and ICU beds, without compromising patient survival. The study's findings support the use of early tracheostomy as a key strategy for managing ICU capacity during overwhelming periods.

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Laryngeal complications after tracheal intubation and tracheostomy.

Lay Summary:

This paper discusses the common problems that can happen to a patient's voice box and throat after they have had a breathing tube inserted for a long time, either from a regular tube through the mouth (intubation) or a tracheostomy tube. These problems, which include difficulty speaking and swallowing, are very common in patients recovering from critical illness.

The authors explain that these complications can cause serious issues, like lung infections and a longer stay in the hospital, which costs more and delays a patient's recovery. They emphasize that a team approach involving doctors, nurses, and especially speech and language therapists (SLTs), is crucial for early detection and treatment of these issues.

The paper outlines various ways to diagnose and treat these problems, from simple exercises to advanced technologies like a tiny camera to look at the throat (FEES) or electrical stimulation. The authors also highlight that the inability to talk during critical illness can cause anxiety and depression, making it harder for patients to participate in their own recovery. They stress the importance of using simple and effective methods, like deflating the tube's cuff or using special speaking valves, to help patients regain their voice and swallowing function as early as possible. They also note that the COVID-19 pandemic has increased these complications due to longer intubation times and other factors, making this topic more important than ever.

Summary for Healthcare Professionals:

This article provides an overview of laryngeal complications, including dysphagia and dysphonia, that can arise after prolonged translaryngeal intubation or tracheostomy in critically ill patients. It highlights that these complications are common, with dysphagia reported in up to 60% and dysphonia in up to 76% of patients, and are associated with significant morbidity, delayed recovery, prolonged hospital stays, and increased mortality risk.

The authors delineate the etiology and risk factors, classifying them as patient-related (e.g., age >50, female sex, obesity, diabetes), intubation-related (e.g., urgent intubation, tube size), and post-intubation factors (e.g., prolonged intubation, high cuff pressure). They emphasize the crucial role of a multidisciplinary team, with a central role for the Speech and Language Therapist (SLT), in early detection and management.

Diagnosis is primarily clinical and can be supported by tools such as the cuff-leak test or laryngeal ultrasound for laryngeal edema. The gold standard for assessing laryngeal function and swallowing is Fibreoptic Endoscopic Evaluation of Swallowing (FEES), which can detect silent aspiration and evaluate the impact of interventions like cuff deflation and Above-Cuff Vocalization (ACV). Therapeutic strategies include secretion management, promoting translaryngeal gas flow with cuff deflation or one-way speaking valves, and targeted voice and swallowing exercises. The article also touches on adjunctive therapies like pharyngeal electrical stimulation and surgical options for persistent anatomical dysfunction. It notes that the COVID-19 pandemic has exacerbated these complications due to prolonged intubation and other factors, underscoring the need for awareness and proactive management.

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Scientific abstracts and references

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World J Surg. 2021 Jun 2:1-5. doi: 10.1007/s00268-021-06176-3. Online ahead of print.

Tracheostomy Practices for Mechanically Ventilated Patients in Malawi.

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BACKGROUND: Tracheostomy is used for patients who require prolonged mechanical ventilation. Extensive research has described the provision and optimal timing of tracheostomy, but very little describes tracheostomy utilization in low- and middle-income countries, particularly in sub-Saharan Africa. METHODS: This prospective cohort study describes patients admitted to the intensive care unit (ICU) of a tertiary hospital in Malawi who received tracheostomy versus those who did not, with a primary outcome of hospital mortality. We performed subgroup analysis of patients with severe head injuries. RESULTS: The analysis included 451 patients admitted to the study ICU between September 2016 and July 2018. Overall hospital mortality was 40% for patients who received tracheostomy and 63% for patients who did not. Logistic regression modeling revealed an odds ratio (OR) of 0.34 (95% CI 0.18-0.64) for hospital mortality among patients who received tracheostomy versus those who did not ($p < 0.001$). Standardized mortality ratio weighting revealed an odds ratio of 0.81 (95% CI 0.65-0.99, $p < 0.001$) for hospital death among patients who received tracheostomy versus those who did not. In the subgroup excluding severe head injury, both ICU (50%) and hospital mortality (75%) were higher overall, but hospital mortality was not more common for patients with tracheostomy versus without (OR 1.28, 95% CI 0.94-1.74, $p = 0.104$). CONCLUSIONS: Tracheostomy is not associated with hospital mortality in a Malawi ICU cohort, but these results are affected by the presence of head injury. Research may focus on home tracheostomy care given the lack of hospital discharge options for patients in austere settings.

Chest. 2021 Jun 17:S0012-3692(21)01125-9. doi: 10.1016/j.chest.2021.06.015. Online ahead of print.

Early tracheostomy for managing ICU capacity during the COVID-19 outbreak: a propensity-matched cohort study.

Hernandez G(1), Ramos FJ(2), Añon JM(3), Ortiz R(4), Colinas L(5), Masclans JR(6), De Haro C(7), Ortega A(8), Peñuelas O(9), Cruz-Delgado MM(10), Canabal A(11), Plans O(12), Vaquero C(13), Rialp G(14), Gordo F(15), Lesmes A(16), Martinez M(2), Figueira JC(3), Gomez-Carranza A(4), Corrales R(17), Castellvi A(18), Castiñeiras B(8), Frutos-Vivar F(9), Prada J(19), De Pablo R(20), Naharro A(21), Montejo JC(16), Diaz C(3), Santos-Peral A(4), Padilla R(5), Marin-Corral J(6), Rodriguez-Solis C(9), Sanchez-Giralt JA(11), Jimenez J(9), Cuena R(22), Perez-Hoyos S(23), Roca O(24).

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BACKGROUND: During the first wave of the COVID-19 pandemic, shortages of ventilators and intensive care unit (ICU) beds overwhelmed healthcare systems. Whether early tracheostomy reduces the duration of mechanical ventilation and ICU stay is controversial. RESEARCH QUESTION: Can "failure-free days" outcomes focused on ICU resources could help decide the optimal timing of tracheostomy in overburdened healthcare systems during viral epidemics? STUDY DESIGN AND METHODS: This retrospective cohort study included consecutive patients with COVID-19 pneumonia tracheostomized in 15 Spanish ICUs during the surge, when ICU occupancy modified clinicians criteria to perform tracheostomy in COVID-19 patients. We compared ventilator-free days at 28 and 60 days and ICU- and hospital bed-free days at 28 and 60-days in propensity-score-matched cohorts tracheostomized at different timings (≤7 days, 8-10 days, 11-14 days after intubation). RESULTS: Of 1939 patients admitted with COVID-19 pneumonia, 682 (35.2%) were tracheostomized, 382 (56%) within 14 days. Earlier tracheostomy was associated with more ventilator-free days at 28 days [≤7 vs. >7d (116 patients included in the analysis): median 9 days (IQR 0-15) vs. 3 (0-7), difference between groups 4.5 days, 95%CI (2.3 to 6.7); 8-10 vs. >10d (222 patients analysed): 6 (0-10) vs. 0 (0-6), difference 3.1 days, 95%CI (1.7 to 4.5); 11-14 vs. >14d (318 patients analysed): 4 (0-9) vs. 0 (0-2), difference 3 days, 95%CI (2.1 to 3.9)]. Except hospital bed-free days at 28 days, all other endpoints were better in early tracheostomy. INTERPRETATION: Optimal timing of tracheostomy may improve patient outcomes and alleviate ICU capacity strain during the COVID-19 pandemic without increasing mortality. Tracheostomy within the first work on ventilator may particularly improve ICU availability.

DOI: 10.1016/j.chest.2021.06.015 PMID: 34147502

BJA Educ. 2021 Jul;21(7):250-257. doi: 10.1016/j.bjae.2021.02.005. Epub 2021 Apr 21.

Laryngeal complications after tracheal intubation and tracheostomy.

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DOI: 10.1016/j.bjae.2021.02.005 PMCID: PMC8212164 PMID: 34178381

Conflict of interest statement: The authors declare that they have no conflicts of interest.