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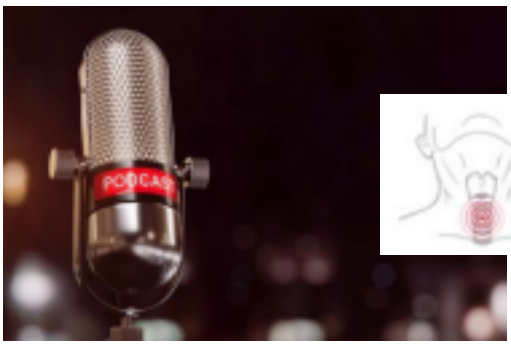

National Tracheostomy Safety Project

This month's top papers: November 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

Please note that the comments below and on the podcasts represent the individual authors' opinions and do not reflect the opinions of any of the organisations that the authors work for. Please leave any comments in the chat function or via X.

This month's top papers

- Comparative effectiveness of ultrasound-guided and anatomic landmark percutaneous dilatational tracheostomy: A systematic review and meta-analysis
- Tracheostomy decannulation outcomes in 131 consecutive neurosurgical patients
- Virtual Laryngectomy Club: A Reality
- Return to School for Children With Tracheostomy or Requiring Noninvasive Ventilation Lessons From the First Lockdown in the United Kingdom
- Practice of tracheostomy in patients with acute respiratory failure related to COVID-19 - Insights from the PRoVENT-COVID study

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Comparative effectiveness of ultrasound-guided and anatomic landmark percutaneous dilatational tracheostomy: A systematic review and meta-analysis

Lay Summary:

This study compares two different methods for a procedure called percutaneous dilatational tracheostomy (PDT), which involves creating an opening in the neck to insert a breathing tube. The two methods are:

1. Ultrasound-guided tracheostomy (UGT): Doctors use real-time ultrasound imaging to see the internal structures of the neck.
2. Landmark tracheostomy (LT): Doctors rely on feeling the anatomical landmarks on the outside of the neck.

By reviewing and combining the results of four previous studies, the researchers found that using ultrasound guidance is more effective in two key areas. First, it significantly increases the chance of successfully placing the tube on the first try. Second, it reduces the number of complications during the procedure. However, the study did not find a significant difference between the two methods in terms of a reduction in severe bleeding or the total time it takes to complete the procedure. The conclusion is that using real-time ultrasound is a safer method for performing a tracheostomy as it leads to fewer complications and a higher success rate on the first attempt.

Summary for Healthcare Professionals:

This systematic review and meta-analysis compared the efficacy of real-time ultrasound-guided tracheostomy (UGT) with traditional landmark tracheostomy (LT) in intubated patients. The review included four studies, comprising three randomized controlled trials (RCTs) and one nonrandomized controlled study (NRS), with a total of 474 patients.

The meta-analysis found that UGT was superior to LT in two key outcomes:

- First-pass success: UGT significantly increased the odds of first-pass success compared to LT (OR: 4.287; 95% CI: 2.308 to 7.964).
- Complication rate: UGT was associated with a significant decrease in the odds of complications (OR: 0.422; 95% CI: 0.249 to 0.718).

However, the study found no significant difference between the two methods for other outcomes. UGT did not significantly reduce the rate of major bleeding (OR: 0.374; 95% CI: 0.112 to 1.251). The comparison of total procedure time was also inconclusive (SMD: -0.335; 95% CI: -0.842 to 0.172), as this outcome was only reported in two of the included studies.

The authors conclude that real-time UGT is a safe and feasible method that increases first-pass success and decreases overall complications compared with the LT method. They suggest further research is needed to definitively compare major bleeding rates and total procedure time between the two techniques.

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Tracheostomy decannulation outcomes in 131 consecutive neurosurgical patients

Lay Summary:

This study looked at what makes it difficult to remove a tracheostomy tube from patients who have had neurosurgery. A tracheostomy is a tube in the neck that helps a patient breathe. The researchers reviewed the cases of 131 patients and divided them into two groups: those whose tubes were easy to remove and those where it was difficult. They defined "difficult" as taking longer than three months to remove the tube.

The study found three main factors that were linked to difficult removal:

1. A low score on the Glasgow Coma Scale (GCS) when they were admitted to the hospital. This scale measures a person's level of consciousness, so a lower score means they were in a more severe condition.
2. Paralysis of the vocal cords three months after the tracheostomy was performed.
3. Having pneumonia within one month of the tracheostomy.

Patients who had a difficult time getting their tube removed also had worse outcomes. They stayed in the hospital longer, were less likely to survive, and had poorer neurological recovery. Most of the patients in the difficult group were discharged to long-term care facilities, while most of those in the easy group were able to go home. The study concludes that these three factors can help doctors predict which patients might have a harder time with the removal process.

Summary for Healthcare Professionals:

This retrospective study investigated factors associated with difficult tracheostomy decannulation and evaluated outcomes in neurosurgical patients. The study reviewed 131 consecutive tracheostomized neurosurgical patients, classifying them into "easy decannulation" (tube removed within 3 months) and "difficult decannulation" (tube removed after 3 months) groups.

Multivariable logistic regression analysis identified three factors that were statistically significant predictors of difficult decannulation:

- A Glasgow Coma Scale (GCS) score of ≤8 on admission.
- The presence of vocal cord palsy at 3 months post-tracheostomy.
- The presence of pneumonia within 1 month post-tracheostomy.

The study found a strong association between difficult decannulation and poorer patient outcomes. The difficult decannulation group had a significantly longer length of in-patient stay, a lower survival rate, and less favorable neurological outcomes (GOS 4–5) at both 6 months and 1 year compared to the easy decannulation group. Furthermore, a majority of patients in the difficult decannulation group (42%) were discharged to an infirmary, while a majority in the easy decannulation group (54%) were discharged to home. The conclusion is that a low GCS score on admission, vocal cord palsy, and post-tracheostomy pneumonia are key predictors of difficult decannulation and are associated with a poor prognosis in neurosurgical patients.

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Virtual Laryngectomy Club: A Reality

Lay Summary:

This paper describes how a hospital in India used a virtual meeting to continue a support group for patients who have had a total laryngectomy, which is the surgical removal of the voice box. These patients, who are unable to speak verbally, require extensive rehabilitation and often rely on support groups, or "laryngectomee clubs," to connect with others facing similar challenges.

When the COVID-19 pandemic began in 2020, strict lockdowns and safety measures prevented these patients from attending their regular in-person meetings. To address this, the hospital team successfully organized an online virtual meeting for their club members using video conferencing. A total of 43 patients and three new patients who were about to undergo the surgery attended the virtual meeting. The meeting allowed them to share their experiences with surgery and the pandemic, and they discussed important topics like how to care for their stoma (the breathing opening in the neck) and prevent COVID-19 infection.

The authors conclude that these online platforms have great potential for connecting with patients, answering their questions, and providing encouragement and hope during difficult times, even though they can't replace the full scope of in-person cancer care.

Summary for Healthcare Professionals:

This brief communication describes the successful implementation of a virtual laryngectomee club meeting in response to the challenges posed by the COVID-19 pandemic. Total laryngectomy, a standard treatment for advanced laryngeal carcinoma, necessitates comprehensive rehabilitation, with speech rehabilitation being of utmost importance. The authors previously ran a successful in-person laryngectomee club to facilitate peer interaction and provide holistic support.

Following the World Health Organization's declaration of a global pandemic in March 2020, in-person follow-up visits and club meetings were no longer feasible. Inspired by the shift to virtual meetings for healthcare professionals, the team organized an online meeting for their patients on August 19, 2020, using Zoom. The meeting was attended by 43 post-laryngectomy and three pre-operative patients. Participants shared their experiences regarding surgery, postoperative quality of life, and coping with the pandemic. Key topics of discussion included stoma care and infection prevention measures for COVID-19.

The authors conclude that while these virtual platforms are not a substitute for comprehensive cancer care, they offer a valuable, untapped potential for patient interaction, addressing queries, and providing psychological support and hope during challenging times. The paper highlights the utility of digital platforms for maintaining community and support for this patient population.

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Return to School for Children With Tracheostomy or Requiring Noninvasive Ventilation Lessons From the First Lockdown in the United Kingdom

Lay Summary:

This paper discusses the challenges and lessons learned from getting children with tracheostomies or those who need breathing machines back to school during the COVID-19 pandemic. A tracheostomy is a tube placed in the neck to help a child breathe.

The authors point out that while schools were closed to protect children, it became clear that for these specific, medically vulnerable children, returning to school was crucial for their learning, social development, and overall health. However, schools faced many difficulties, including confusion over safety guidelines, a lack of staff, and limited access to protective equipment.

The main problem was a lack of clear guidance. Some rules suggested that procedures like suctioning the tracheostomy tube could create virus-carrying aerosols, requiring staff to wear the highest level of protective gear and use separate rooms. Other guidance, however, said that this high level of protection was not necessary for simple tracheostomy care in a healthy child. This conflicting advice made it hard for schools to prepare for the children's return.

The paper recommends that for future health crises, there needs to be clearer, consistent guidance and better support for schools and staff. This includes making sure teachers have access to the right protective equipment if needed, and possibly prioritizing their vaccination. The authors emphasize that schools are a place of safety and education for these children, and getting them back to school should be a priority with a solid plan in place.

Summary for Healthcare Professionals:

This commentary reflects on the challenges of facilitating the return to school for children with tracheostomies or on noninvasive ventilation during the COVID-19 pandemic. The authors, working in a multidisciplinary team of community pediatricians, respiratory doctors, and education professionals, highlight the complexities of balancing the educational and developmental needs of this vulnerable group with the perceived risks of viral transmission.

A primary challenge was conflicting guidance regarding aerosol-generating procedures (AGPs). Some national guidelines, such as those from Public Health England and the American Academy of Pediatrics, recommended a high level of PPE and the use of separate, well-ventilated rooms for procedures like suctioning. In contrast, guidance from the National Tracheostomy Safety Project suggested that aerosol PPE and separate rooms were not essential for routine tracheostomy care in asymptomatic children. This ambiguity created logistical problems for schools, which faced limited staffing and a shortage of appropriate PPE and space.

The commentary proposes several key priorities to ensure a safe return to educational settings for these children in the future:

- **Coherent Guidance**: A need for clear, consistent health guidance on AGPs and the level of PPE required is essential.
- **Resource Availability**: If aerosol PPE is required, schools and staff must have access to it.
- **Professional Prioritization**: Vaccination of education professionals, particularly those who perform AGPs, should be a priority.

The authors conclude that lessons from the first lockdown must be learned to ensure that these children, for whom school is a place of safety, can return to education with proper support and well-defined, practical plans.

NTSP Podcast Series

Practice of tracheostomy in patients with acute respiratory failure related to COVID-19 - Insights from the PRoVENT-COVID study

Lay Summary:

This study looked at the practice of tracheostomy—a procedure to help a patient breathe—for critically ill COVID-19 patients in the Netherlands during the first wave of the pandemic. The main goals were to see how often it was done, when it was done, and if the timing affected patient outcomes.

The study found that about 18.5% of critically ill COVID-19 patients received a tracheostomy, and it was performed relatively late, at a median of 21 days after they were put on a ventilator. The researchers found that patients who received a tracheostomy earlier (on or before day 21) had a shorter time on the ventilator. However, they also had a higher chance of dying in the ICU, in the hospital, and within 90 days. This higher mortality might not be a direct result of the timing, but could be related to other factors, and the authors say more research is needed to be sure. The study also couldn't identify any specific patient characteristics that influenced whether a tracheostomy was performed earlier or later.

The authors conclude that during the first wave, tracheostomies were performed late in the Netherlands, and while earlier timing was linked to a shorter time on the ventilator, it was also associated with a higher death rate. They suggest that further studies are needed to understand these connections better.

Summary for Healthcare Professionals:

This secondary analysis of the PROVENT-COVID study investigated the practice of tracheostomy in invasively ventilated COVID-19 patients in 22 Dutch ICUs during the first wave of the pandemic. The study aimed to determine the incidence and timing of tracheostomy, its association with patient outcomes, and factors influencing timing.

Of 1023 patients, 189 (18.5%) received a tracheostomy at a median of 21 days from the start of invasive ventilation. This timing was consistent across the study period and was not influenced by the publication of an amendment to national guidelines.

The analysis revealed that tracheostomy performed on or before day 21 was independently associated with a shorter duration of ventilation (median 26 vs. 40 days). However, this earlier timing was also associated with higher mortality rates in the ICU (22.1% vs. 10.2%), in the hospital (26.1% vs. 11.9%), and at day 90 (27.6% vs. 14.6%). The study found no patient demographics or ventilation characteristics that had an association with the timing of the procedure.

The authors conclude that tracheostomy was performed late in this patient population and that timing may be associated with outcomes. They note that the higher mortality in the earlier group may be subject to immortal time bias, suggesting that the association is not necessarily causal and warrants further prospective investigation. The study also highlights that the specific factors influencing the timing of tracheostomy in these patients remain unknown.

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Scientific abstracts and references

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PLoS One. 2021 Oct 28;16(10):e0258972. doi: 10.1371/journal.pone.0258972. eCollection 2021.

Comparative effectiveness of ultrasound-guided and anatomic landmark percutaneous dilatational tracheostomy: A systematic review and meta-analysis.

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INTRODUCTION: Ultrasound-guided tracheostomy (UGT) and bronchoscope-guided tracheostomy (BGT) have been well compared. However, the differences in benefits between UGT and landmark tracheostomy (LT) have not been addressed and, in particular, lack a detailed meta-analysis. We aimed to compare the first-pass success, complication rate, major bleeding rate, and tracheostomy procedure time between UGT and LT. METHODS: In a systematic review, relevant databases were searched for studies comparing UGT with LT in intubated patients. The primary outcome was the odds ratio (OR) of first-pass success. The secondary outcomes were the OR of complications, OR of major bleeding, and standardized mean difference (SMD) of the total tracheostomy procedure time. RESULTS: The meta-analysis included three randomized controlled studies (RCTs) and one nonrandomized controlled study (NRS), comprising 474 patients in total. Compared with LT, UGT increased first-pass success (OR: 4.287; 95% confidence interval [CI]: 2.308 to 7.964) and decreased complications (OR: 0.422; 95% CI: 0.249 to 0.718). However, compared with LT, UGT did not significantly reduce major bleeding (OR: 0.374; 95% CI: 0.112 to 1.251) or the total tracheostomy placement time (SMD: -0.335; 95% CI: -0.842 to 0.172). CONCLUSIONS: Compared with LT, real-time UGT increases first-pass success and decreases complications. However, UGT was not associated with a significant reduction in the major bleeding rate. The total tracheostomy placement time comparison between UGI and LT was inconclusive.

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Br J Neurosurg. 2021 Nov 3:1-5. doi: 10.1080/02688697.2021.1995591. Online ahead of print.

Tracheostomy decannulation outcomes in 131 consecutive neurosurgical patients.

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OBJECTIVES: This study was a retrospective study to investigate factors related to difficult tracheostomy decannulation, and to evaluate outcomes of tracheostomized neurosurgical patients. METHODS: All consecutive tracheostomized neurosurgical patients in the Prince of Wales Hospital between 1st September 2016 and 31st August 2019 were reviewed retrospectively. Patients were grouped into easy decannulation and difficult decannulation groups using 3 months as cut-off time. Risk factors were analysed and outcomes were compared. RESULTS: One hundred thirty-one patients were included. In univariate analyses, male gender, GCS less than or equal to 8 on admission, the presence of vocal cord palsy at 3 months, and pneumonia within 1-month post-tracheostomy were associated with difficult decannulation. In multivariable logistic regression for difficult decannulation, GCS on admission, the presence of vocal cord palsy at 3 months, and the presence of pneumonia within 1-month post-tracheostomy remained statistically significant. The easy decannulation group had a shorter length of in-patient stay, higher survival rate, and more favourable neurological outcome (GOS 4-5) than the difficult decannulation group at both 6 months and 1 year. The majority of easy decannulation group patients (54%) were discharged to home, while the majority of the difficult decannulation group (42%) of patients were discharged to the infirmary. CONCLUSION: GCS less than or equal to 8 on admission, the presence of vocal cord palsy, and the presence of pneumonia were associated with difficult tracheostomy decannulation in neurosurgical patients. Difficult decannulation is associated with a longer length of in-patient stay and poor neurological outcomes.

DOI: 10.1080/02688697.2021.1995591 PMID: 34730454

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Indian J Otolaryngol Head Neck Surg. 2021 Nov 2:1-2. doi: 10.1007/s12070-021-02960-8.

Virtual Laryngectomy Club: A Reality.

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Total laryngectomy remains an essential treatment for locally advanced laryngeal carcinoma. However, it involves lifestyle changes for the patient, such as the inability to communicate verbally, breathing or aesthetic changes, which affect their quality of life and require comprehensive rehabilitation. Speech rehabilitation is of utmost importance for these patients. Hence to provide comprehensive rehabilitation after total laryngectomy we have been running a successful laryngectomee club at our institute for the benefit of our patients. But when the World Health Organization on March 11, 2020, declared the novel coronavirus (COVID-19) outbreak a global pandemic, many of our patients couldn't make their regular followup visits. We have successfully conducted the first ever online virtual meeting for our laryngectomee club members via video conferencing service.

DOI: 10.1007/s12070-021-02960-8 PMCID: PMC8562020 PMID: 34745927

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Chest. 2021 Nov;160(5):e495-e497. doi: 10.1016/j.chest.2021.06.011.

Return to School for Children With Tracheostomy or Requiring Noninvasive Ventilation Lessons From the First Lockdown in the United Kingdom.

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Pulmonology. 2021 Sep 20:S2531-0437(21)00189-6. doi: 10.1016/j.pulmoe.2021.08.012. Online ahead of print.

Practice of tracheostomy in patients with acute respiratory failure related to COVID-19 - Insights from the PRoVENT-COVID study.

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OBJECTIVE: Invasively ventilated patients with acute respiratory failure related to coronavirus disease 2019 (COVID-19) potentially benefit from tracheostomy. The aim of this study was to determine the practice of tracheostomy during the first wave of the pandemic in 2020 in the Netherlands, to ascertain whether timing of tracheostomy had an association with outcome, and to identify factors that had an association with timing. METHODS: Secondary analysis of the 'PRactice of VENTilation in COVID-19' (PRoVENT-COVID) study, a multicenter observational study, conducted from March 1, 2020 through June 1, 2020 in 22 Dutch intensive care units (ICU) in the Netherlands. The primary endpoint was the proportion of patients receiving tracheostomy; secondary endpoints were timing of tracheostomy, duration of ventilation, length of stay in ICU and hospital, mortality, and factors associated with timing. RESULTS: Of 1023 patients, 189 patients (18.5%) received a tracheostomy at median 21 [17 to 28] days from start of ventilation. Timing was similar before and after online publication of an amendment to the Dutch national guidelines on tracheostomy focusing on COVID-19 patients (21 [17-28] vs. 21 [17-26] days). Tracheostomy performed ≤ 21 days was independently associated with shorter duration of ventilation (median 26 [21 to 32] vs. 40 [34 to 47] days) and higher mortality in ICU (22.1% vs. 10.2%), hospital (26.1% vs. 11.9%) and at day 90 (27.6% vs. 14.6%). There were no patient demographics or ventilation characteristics that had an association with timing of tracheostomy. CONCLUSIONS: Tracheostomy was performed late in COVID-19 patients during the first wave of the pandemic in the Netherlands and timing of tracheostomy possibly had an

association with outcome. However, prospective studies are needed to further explore these associations. It remains unknown which factors influenced timing of tracheostomy in COVID-19 patients.

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