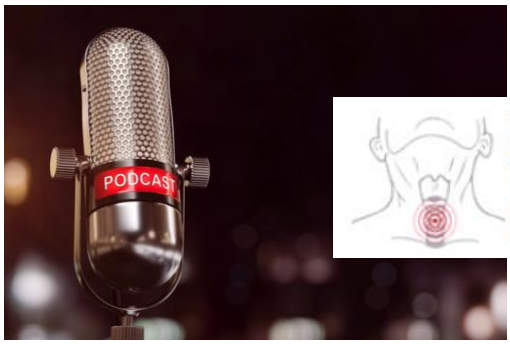

NTSP Podcast series

National Tracheostomy Safety Project

This month's top papers: February 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://twitter.com/NTSP_UK

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This month's top papers

- Total laryngectomy
- Teaching PDT
- Do we need a routine Xray after tracheostomy?
- Adverse events at home vs a care facility
- Outcomes of tracheostomy and gastrostomy in children

Total Laryngectomy-Still Cutting-Edge?

Lay Summary:

Total laryngectomy, a surgical procedure to remove the voice box, is a key treatment for serious throat cancers that haven't spread far in the body. It's especially useful for a type of throat cancer known as T4a carcinoma, where it might give a better chance of recovery compared to just using radiation or chemotherapy. It can also be necessary when there's severe throat dysfunction, like problems swallowing, or if the cancer comes back after other treatments. This surgery is done very carefully and in a controlled way, which makes it safe. Although patients can't speak naturally after surgery, they can use special devices to help them speak again, which greatly improves their lives. The article gives an overview of when this surgery is needed, how it's done (including some new techniques like using robots), what problems could happen, additional treatments that might be used alongside surgery, and how patients can recover afterwards. Despite all the advances in medicine, total laryngectomy remains an important option for treating throat cancer.

Summary for Healthcare Professionals:

Total laryngectomy remains a pivotal intervention in advanced laryngeal and hypopharyngeal squamous cell carcinoma, particularly when distant metastasis is absent. It is noted for its prognostic advantage over primary radiotherapy or chemoradiotherapy, especially in T4a carcinoma cases. Indications for laryngectomy extend to cases of significant laryngeal dysfunction leading to aspiration, or recurrent disease post radio(chemo)therapy, necessitating salvage laryngectomy. The procedure, inclusive of neck dissection, is highly standardized, with a strong safety profile. Post-surgical aphonia is addressed through functional rehabilitation, such as voice prosthesis, significantly enhancing patient quality of life. The article offers a comprehensive review of the criteria for surgery, preoperative assessment, the surgical technique itself (highlighting advancements like robotic surgery), potential complications, adjunctive treatment options, alternative therapies, rehabilitative strategies, and overall patient prognosis. In conclusion, total laryngectomy continues to be a cornerstone surgical technique in the field of head and neck oncology.

Can we improve teaching and learning of percutaneous dilatational tracheostomy's bronchoscopic guidance?

Lay Summary:

In intensive care units, a procedure called percutaneous dilatational tracheostomy is often used to help patients breathe. This procedure is usually guided by a tool called a bronchoscope, which helps doctors see inside the throat. This method is safe and successful, but there hasn't been much written about how to use the bronchoscope during the procedure. A team from Pontificia Universidad Católica de Chile has come up with 10 ways to improve how this technique is taught and performed. Their goal is to make sure that the people learning the procedure can do it well and safely, which in turn makes it safer for patients.

Summary for Healthcare Professionals:

Percutaneous dilatational tracheostomy (PDT) is increasingly the preferred method in intensive care settings, with bronchoscopic guidance enhancing safety and procedural success. Despite its widespread implementation, there is a lack of detailed literature addressing the nuances of bronchoscopic involvement in PDT. This article from the intensive care and respiratory departments of Pontificia Universidad Católica de Chile proposes 10 targeted recommendations aimed at refining the bronchoscopic aspects of PDT. These suggestions are designed to elevate the proficiency of procedural operators and, concurrently, to improve the educational framework for PDT. Emphasizing both the technical and pedagogical facets, the article underscores the importance of structured teaching and the mastery of bronchoscopic skills to augment patient safety during PDT.

Should pulmonary radiographs be taken routinely following paediatric tracheostomy?

Lay Summary:

The practice of taking chest X-rays after children have a tracheostomy—a surgery to create a breathing hole in the throat—has been questioned lately because complications from the surgery have become less common. A study in Turkey looked at 120 children who had these X-rays after their tracheostomies to see if the X-rays were still necessary. They found that about 1 in 4 children had complications after the surgery, but none of them had a specific serious lung problem called pneumothorax. The X-rays showed new issues in only about 7 out of 100 children, like lung infection in most and tube misplacement in one. Importantly, none of these issues needed any immediate medical action. This leads to the conclusion that routine chest X-rays might not be needed after a tracheostomy, even for children who are considered at higher risk.

Summary for Healthcare Professionals:

This study investigates the utility of routine postoperative pulmonary radiography in pediatric tracheostomy patients. Historically, post-tracheostomy radiographs have been standard practice due to concerns over procedural complications. This retrospective review of 120 pediatric patients from Ondokuz Mayıs University in Turkey, who underwent tracheostomy between January 2012 and January 2018, aimed to ascertain the necessity of this practice in light of decreased complication rates in recent years. Postoperative radiographs were assessed by two pediatric radiology specialists for any new findings.

The results indicated a 23.3% complication rate post-tracheostomy, with no incidents of pneumothorax. The subgroup analysis of patients who had emergency tracheostomies or were under 2 years old—typically higher-risk categories—did not show an increased rate of complications. Notably, new findings were identified in only 6.6% of postoperative radiographs, consisting primarily of infiltration and a single case of tracheostomy tube malposition, none of which necessitated immediate medical intervention. The study concludes that routine postoperative chest X-rays may not be necessary in the pediatric population following tracheostomy, inclusive of those considered at higher risk.

Severe adverse events in children with tracheostomy and home mechanical ventilation - Comparison of pediatric home care and a specialized pediatric nursing care facility.

Lay Summary:

As medical treatments and breathing machines get better, more children who need help breathing through a tube in their throat (tracheostomy) and home breathing machines (home mechanical ventilation or HMV) are being cared for either at home or in specialized nursing facilities. A study looked back at seven years of records to see how often serious problems happened in these two settings. They looked at the experiences of 70 children, finding that almost half had their tracheostomy before they turned one year old. They found 35 big problems in total, but the chance of these happening was the same whether the children were at home or in a nursing facility. However, there were more issues related to the tracheostomy and infections in the home care setting. Younger children and those with feeding issues had a higher risk of serious problems. Also, children who needed more intensive nursing care were more likely to have serious problems. Overall, serious events were rare for children on home mechanical ventilation, showing that with good care, this can be a safe option for families.

Summary for Healthcare Professionals:

This retrospective study evaluates the incidence and nature of severe adverse events in pediatric patients with tracheostomy and home mechanical ventilation (HMV), comparing outcomes in home care settings versus a specialized pediatric nursing care facility. The analysis encompassed 163.9 patient-years across 70 children over a 7-year period. Notably, nearly half of the tracheostomies were performed in children under one year of age.

Overall, 35 severe adverse events were reported, equating to an incidence of 0.21 events per patient-year. The comparative analysis revealed no significant difference in the incidence of adverse events between home care and the specialized nursing care facility. However, the home care setting exhibited a higher frequency of tracheostomy-related incidents and infections. Risk factors for increased adverse events included age under one year and the presence of feeding difficulties such as nasogastric tubes and percutaneous endoscopic gastrostomy, with corresponding odds ratios of 3.27 and 9.08, respectively. Patients requiring more intensive nursing care also exhibited a higher rate of severe adverse events. The conclusion drawn is that HMV via tracheostomy in pediatric patients is associated with infrequent emergencies or adverse events, irrespective of the care setting.

Outcomes of gastrostomy placement with and without concomitant tracheostomy among ventilator dependent children.

Lay Summary:

This study explored whether having two surgeries at once—a gastrostomy tube (GT) placement and a tracheostomy—might cause more health problems for young children who need help breathing (ventilator-dependent) compared to just having a GT placement. A GT is a tube inserted into the stomach to provide nutrition, and a tracheostomy is a hole made in the windpipe to help with breathing. They looked at over 1,100 children under two years old who were on ventilators and found that major problems after surgery were actually less common when the two procedures were done together, compared to just having a GT placed. Also, the risks of serious problems like heart issues or stroke were about the same across the board, no matter which surgery the children had. This suggests that doing both surgeries at once can be a safe option and might be better because it means less exposure to anesthesia for these young patients.

Summary for Healthcare Professionals:

This retrospective cohort study examines the postoperative outcomes of gastrostomy tube (GT) placement with and without concurrent tracheostomy among ventilator-dependent children under two years of age. Utilizing the NSQIP-Pediatric Participant User Files from 2012-2018, the study categorized patients into three groups: GT placement alone in mechanically ventilated children (MV-GT), simultaneous GT and tracheostomy (GT+T), and GT placement alone with an existing tracheostomy (T-GT).

The analysis encompassed 1100 patients: 351 in MV-GT, 494 in GT+T, and 255 in T-GT. The incidence of major complications was statistically different among groups, occurring in 23.6%, 17.0%, and 14.5%, respectively. However, after adjustment for potential confounders, the GT+T group did not show a higher risk of major complications compared to the T-GT group (aOR=1.19), and a lower risk compared to the MV-GT group (aOR=0.67). The rates of severe complications, including mortality, cardiac arrest, and stroke, were comparable across groups.

The study concludes that combined GT and tracheostomy placement does not increase postoperative complications compared to either procedure alone in children under two years of age who are ventilator-dependent. This finding supports the consideration of combined procedures to minimize anesthetic exposure in this vulnerable population. The study provides Level III evidence in treatment strategy efficacy.

Scientific abstracts and references

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Cancers (Basel). 2021 Mar 19;13(6):1405. doi: 10.3390/cancers13061405.

Total Laryngectomy-Still Cutting-Edge?

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Surgical removal of the larynx (total laryngectomy) offers a curative approach to patients with advanced laryngeal and hypopharyngeal (squamous cell) cancer without distant metastases. Particularly in T4a carcinoma, laryngectomy seems prognostically superior to primary radio(chemo)therapy. Further relevant indications for laryngectomy include massive laryngeal dysfunction associated with aspiration and recurrence after radio(chemo)therapy, resulting in salvage surgery. The surgical procedure including neck dissection is highly standardised and safe. The resulting aphonia can be compensated by functional rehabilitation (e.g., voice prosthesis) associated with a significant quality of life improvement. This article presents an overview of indications, preoperative diagnostics, surgical procedures, including new developments (robotics), possible complications, the choice of adjuvant treatment, alternative therapeutic approaches, rehabilitation and prognosis. In summary, total laryngectomy still represents a relevant surgical procedure in modern head and neck oncology.

DOI: 10.3390/cancers13061405 PMID: 33808695

SAGE Open Med. 2021 Mar 17;9:20503121211002321. doi: 10.1177/20503121211002321. eCollection 2021.

Can we improve teaching and learning of percutaneous dilatational tracheostomy's bronchoscopic guidance?

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Percutaneous dilatational tracheostomy has become the technique of choice in multiple intensive care units. Among innovations to improve procedural safety and success, bronchoscopic guidance of percutaneous dilatational tracheostomy has been advocated and successfully implemented by multiple groups. Most published literature focuses on the percutaneous dilatational tracheostomy operator, with scarce descriptions of the bronchoscopic particularities of the procedure. In this article, we provide 10 suggestions to enhance specific procedural aspects of bronchoscopic guidance of percutaneous dilatational tracheostomy, and strategies to optimize its teaching and learning, in order to promote learners' competence acquisition and increase patient safety.

DOI: 10.1177/20503121211002321 PMCID: PMC7983236 PMID: 33796301

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Should pulmonary radiographs be taken routinely following paediatric tracheostomy?

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AIM: As the rates of complications related to tracheostomy procedures have fallen in recent years, the routine taking of pulmonary radiographs following tracheostomy has become a matter of debate. The aim of this study was to compare the incidence of complications developing in 120 children who had pulmonary radiographs taken following surgical tracheostomy and to thereby evaluate the necessity of routine pulmonary radiographs after tracheostomy. METHODS: The data were retrospectively reviewed of 120 children who had pulmonary radiographs taken following surgical tracheostomy between January 2012 and January 2018. The pulmonary radiographs taken before and immediately after tracheostomy were evaluated independently by two paediatric radiology specialists and the results were recorded. RESULTS: The incidence of complications after tracheostomy was determined as 23.3%, and no pneumothorax was determined in any patient. An increase was not seen in the complication incidence in those who had undergone emergency tracheostomy and patients aged < 2 years, which are accepted as high-risk groups. In the evaluation of the pre- and post-tracheostomy radiographs, new findings were determined on the post-tracheostomy radiograph that had not been there previously in eight patients (6.6%). These findings were newly formed infiltration in seven patients (5.8%), and malposition of the tracheostomy tube in one patient (0.8%). No pathology requiring intervention was determined on the radiographs of any patient. CONCLUSION: The results of this study support the view that it is not necessary to take pulmonary radiographs routinely following tracheostomy in the paediatric age group, including those at higher risk.

DOI: 10.1177/02184923211006312 PMID: 33779303

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Severe adverse events in children with tracheostomy and home mechanical ventilation - Comparison of pediatric home care and a specialized pediatric nursing care facility.

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BACKGROUND: Advances in medical care and ventilator technologies increase the number of children with tracheostomy and home mechanical ventilation (HMV). Data on severe adverse events in home care and in specialized nursing care facilities are limited. PATIENTS AND METHODS: Retrospective analysis of incidence and type of severe adverse events in children with tracheostomy and HMV in home care compared to a specialized nursing care facility over a 7-year period. RESULTS: 163.9 patient-years in 70 children (home care: 110.7 patient-years, 24 patients; nursing care facility: 53.2 patient-years, 46 patients) were analyzed. In 34 (48.6%) patients tracheostomy was initiated at the age of <1 year. 35 severe adverse events were identified, incidence of severe adverse events per patient-year was 0.21 (median 0.0 (0.0-3.0)). We observed no difference in the rate of severe adverse events between home care and specialized nursing care facility (0.21 [y-1]; median 0.0 (0.0-3.0) versus 0.23 [y-1]; median 0.0 (0.0-1.6); p = 0.690), however, significantly more tracheostomy related incidents and infections occurred in the home care setting. Young age (<1 year) (Odds ratio 3.27; p = 0.045) and feeding difficulties (nasogastric tubes and percutaneous endoscopic gastrostomy) (Odds ratio 9.08; p = 0.016) significantly increased the risk of severe adverse events. Furthermore, the rate of severe adverse events was significantly higher in patients with a higher nursing score. CONCLUSION: Pediatric home mechanical ventilation via tracheostomy is rarely associated with emergencies or adverse events in home care as well as in a specialized nursing care facility setting.

DOI: 10.1016/j.rmed.2021.106392 PMID: 33865662

J Pediatr Surg. 2021 Mar 26:S0022-3468(21)00262-1. doi: 10.1016/j.jpedsurg.2021.03.028. Online ahead of print.

Outcomes of gastrostomy placement with and without concomitant tracheostomy among ventilator dependent children.

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INTRODUCTION: Simultaneous gastrostomy tube (GT) and tracheostomy placement in young children offers potential benefit in limiting anesthetic exposure, but it is unknown whether combining these procedures introduces additional morbidity. This study compared outcomes after combined GT and tracheostomy placement versus GT placement alone among similar ventilator-dependent patients. METHODS: Ventilator-dependent children <2-years-old who underwent GT placement alone (MV-GT), simultaneous GT and tracheostomy placement (GT+T), and GT placement alone with a pre-existing tracheostomy (T-GT) were identified using 2012-2018 NSQIP-Pediatric Participant User Files. Multiple logistic regression models were used to compare outcomes while adjusting for other group differences. RESULTS: Among 1100 children, 351 underwent MV-GT, 494 GT+T, and 255 T-GT. Major complications occurred in 23.6%, 17.0%, and 14.5% of the respective groups (p = 0.01). Major complications with GT+T were similar to T-GT (adjusted odds ratio [aOR]=1.19, 95%CI:0.78-1.83, p = 0.4) and lower than MV-GT (aOR=0.67, 95%CI:0.47-0.95, p = 0.02). Severe complications including mortality, cardiac arrest, and stroke were similar between the three groups (p = 0.8). CONCLUSIONS: Children <2-years-old undergoing GT+T did not experience higher post-operative complications compared to children undergoing T-GT or MV-GT. Utilizing GT+T to limit anesthetic exposure may be reasonable within this high-risk population. TYPE OF STUDY: Treatment Study LEVEL OF EVIDENCE: Level III.

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