Trauma Surgery & Acute Care Open

Complications of small-bore feeding tubes: is newer technology necessarily better?

Yesica Campos ,[1,2] Claire Kerin,[3] Ranier Reyes[1,2]

[1]Department of Neurology, The University of Texas Southwestern Medical Center, Dallas, Texas, USA
[2]Department of Neurosurgery, The University of Texas Southwestern Medical Center, Dallas, Texas, USA
[3]Department of Neuroscience ICU, The University of Texas Southwestern Medical Center, Dallas, Texas, USA

Correspondence to
Dr Ranier Reyes; ranier.reyes@utsouthwestern.edu

Received 8 August 2020
Accepted 10 August 2020

To cite: Campos Y, Kerin C, Reyes R. *Trauma Surg Acute Care Open* 2020;**5**:e000572.

Dear editor,

Jacobson *et al*[1] keenly examined how a novel electromagnetic tracking system may be safely used to ensure correct placement of small-bore feeding tubes (SBFTs). Clinical practice has shifted such that SBFTs are preferred for short-term feeding due to a reduction in aspiration risk and perceived patient comfort.[2] The latter, however, is largely anecdotal and may reflect provider perception rather than reality. In actuality, traditional large-bore feeding tubes (LBFTs) may be the favorable option.

SBFTs are commonly placed blindly with a 1%–3% incidence of erroneous airway insertion. A pneumothorax occurs in one-third of pulmonary misplacements with an associated mortality rate reportedly exceeding 20%. Additional pulmonary complications include hemothoraces, pneumonias and broncho-pleural fistulas.[1 3] SBFTs employ a rigid guidewire—the suspected culprit behind direct pulmonary injury—for structural support. Their smaller caliber also increases risk of traversing an endotracheal tube cuff and passing into the distal bronchioles before detection.[4]

Though Jacobson *et al* reported no pulmonary complications in their cohort, the study was designed as a safety and feasibility analysis. They astutely acknowledge the relatively small sample included, and with a low event rate for misplacement quoted in various studies, readers must be cautious about drawing conclusions regarding complication frequency in a broader clinical context. The underreported incidence of misplacement in the literature and the undetermined comparative cost of modern methods are of additional importance.[1 5 6] Thus, large-scale prospective studies establishing efficacy and cost-effectiveness of novel approaches against conventional practices are still necessary. Targeting populations at highest risk for misplacement—critically ill and neurologically injured patients—would also be of unique interest.

Large-bore (≥14 Fr) devices are a common alternative. Generally easier to insert, LBFTs lack a stylet and are advantageous for gastric decompression/irrigation. Pulmonary complications are similar to those of SBFTs, but incidence is even more poorly documented. Outside of specific situations where SBFTs may be indicated (high aspiration risk, feeding intolerance, altered gastric anatomy and severe gastroparesis), traditional LBFTs might be superior because of their safety profile, ease/speed of placement and cost-efficiency when considering confirmation technology expenses and SBFT-related consequences.[7] Admittedly, this may purely be speculation, as dedicated studies regarding LBFT complications are lacking.[8] Despite some evidence in favor of SBFTs with respect to aspiration pneumonia, this benefit has not translated into other clinically significant measures; gastric access for initial enteric nutrition is still recommended.[9 10]

In conclusion, we emphasize the scarcity of data regarding traditional LBFTs. Thorough assessment of complication rates would be beneficial in providing a framework to address safety concerns with various types of enteric access. While advancements in confirmation techniques of SBFTs are necessary and should be met with excitement, their success must be interpreted with respect to alternative methods. Directly investigating superiority or non-inferiority of large-bore versus small-bore tubes in regards to misplacement, pulmonary complications and cost-effectiveness remains an area of interest in critical illness nutrition with the potential to improve patient safety and avoid unnecessary healthcare expenditures. Until then, LBFTs may be preferred.

Contributors All authors contributed equally toward concept, literature review, preparation and final revisions of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.

ORCID iD
Yesica Campos http://orcid.org/0000-0003-3010-9210

REFERENCES

1. Jacobson LE, Olayan M, Williams JM, Schultz JF, Wise HM, Singh A, Saxe JM, Benjamin R, Emery M, Vilem H, *et al*. Feasibility and safety of a novel electromagnetic device for small-bore feeding tube placement. *Trauma Surg Acute Care Open* 2019;4:e000330.
2. Pash E. Enteral nutrition: options for short-term access. *Nutr Clin Pract* 2018;33:170–6.
3. Wischmeyer PE, McMoon MM, Waldron NH, Dye EJ. Successful identification of anatomical markers and placement of feeding tubes in critically ill patients via camera-assisted technology with real-time video guidance. *JPEN J Parenter Enteral Nutr* 2019;43:118–25.
4. Rassias AJ, Ball PA, Corwin HL. A prospective study of tracheopulmonary complications associated with the placement of narrow-bore enteral feeding tubes. *Crit Care* 1998;2:25–8.

5. EMP F, Tan SB, Ang SY. Nasogastric tube placement confirmation: where we are and where we should be heading. *Proceedings of Singapore Healthcare* 2017;26:189–95.
6. Bourgault AM, Powers J, Aguirre L. Pneumothoraces prevented with use of electromagnetic device to place feeding tubes. *Am J Crit Care* 2020;29:22–32.
7. McClave SA, Taylor BE, Martindale RG, Warren MM, Johnson DR, Braunschweig C, McCarthy MS, Davanos E, Rice TW, Cresci GA, *et al*. Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of critical care medicine (SCCM) and American Society for parenteral and enteral nutrition (A.S.P.E.N.). *JPEN J Parenter Enteral Nutr* 2016;40:159–211.
8. Smith AL, Santa Ana CA, Fordtran JS, Guileyardo JM. Deaths associated with insertion of nasogastric tubes for enteral nutrition in the medical intensive care unit: clinical and autopsy findings. *Proc* 2018;31:310–6.
9. Singer P, Blaser AR, Berger MM, Alhazzani W, Calder PC, Casaer MP, Hiesmayr M, Mayer K, Montejo JC, Pichard C, *et al*. ESPEN guideline on clinical nutrition in the intensive care unit. *Clin Nutr* 2019;38:48–79.
10. Alkhawaja S, Martin C, Butler RJ, Gwadry-Sridhar F. Post-pyloric versus gastric tube feeding for preventing pneumonia and improving nutritional outcomes in critically ill adults. *Cochrane Database Syst Rev* 2015;2015:Cd008875.