

Comparing nasogastric and direct tube feeding in stroke

Enteral feeding going down the tube

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Dysphagia is a silent killer after stroke. Swallowing disorders affect more than half of 800,000 people who have a stroke every year in the United States. Dysphagia frequently results in pneumonia, malnutrition, and dehydration, which can lead to increased mortality and poor outcome.¹ To prevent these complications, enteral tube feeding is indicated in selected cases. Tube feeding carries some risk and can lead to discomfort, local infections, bleeding, and the need to restrain patients. To balance risks and benefits, guidelines^{2,3} recommend nasogastric tube (NGT) feeding if oral intake remains insufficient for 1 week or longer. If dysphagia persists for more than 4 weeks, patients warrant direct enteral tube (DET) feeding with percutaneous endoscopic gastrostomy (PEG) or jejunostomy.

Stroke survivors receive enteral nutrition frequently. Almost 1 in 10 will receive DET feeding and even more will have feeding through NGTs.⁴ Despite the frequent use of these procedures, surprisingly little data exist on the long-term outcome in patients receiving enteral nutrition.

In this issue of *Neurology*®, Joundi et al.⁵ shed light on long-term outcomes in stroke survivors receiving NGT or DET feeding. The authors used retrospective data of 37,870 people who had a stroke in Ontario, Canada. They carefully matched the characteristics of 1,421 people who received DET insertion with those of 1,421 people who received NGT alone. By balancing the study groups, they reduced the effects of baseline differences on their results and made it possible to infer the effects of feeding methods on outcomes after stroke.

The group receiving DET insertion had poorer long-term outcomes than those with NGT feeding alone. DET-fed patients had a higher risk of death more than 30 days after discharge (30–89 days, hazard ratio [HR] 1.4; 90–179 days, HR 2.2; 180–365 days, HR 1.6; 366–730 days, HR 1.3) and a higher overall 2-year mortality (41% vs 36%) compared to the NGT group. The DET group was also more likely to be readmitted for treatment of aspiration pneumonia (14% vs 5%), pressure ulcers (5% vs 2%), sepsis (8% vs 3%), and gastrointestinal hemorrhage (6% vs 4%) within 2 years after stroke compared to those receiving NGT alone. By contrast, the authors found lower mortality of DET-fed patients in the first 30 days after discharge. This was most likely due to the shorter length of hospital stay and more severe disability in the NGT-fed group. The differences in short-term outcome disappeared after controlling for these factors.

How do these striking results compare to other studies? A recent Cochrane review did not find a difference in mortality or pneumonia between PEG and NGT feeding.⁶ Most of the included studies, however, were small, were heterogeneous, and had short follow-up. On the other hand, the largest and most robust randomized controlled trial (RCT) to date, the FOOD trial, found a borderline significant ($p = 0.05$) 7.8% increase of death or poor outcome 6 months after stroke in people randomized to PEG feeding ($n = 162$) compared to NGT feeding ($n = 159$).⁷

By comparison, the nested case-control study by Joundi et al.⁵ has a substantially larger sample size and longer follow-up than previous RCTs. Its main drawbacks are the retrospective approach and

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lack of randomization, and one should thus interpret the results cautiously. Despite elegantly using propensity score matching to balance for baseline group differences, residual confounding may remain that the authors could not account for. In addition, there are few data on swallowing performance, timing of tube placement, and decisions leading to enteral feeding. The definition of complications based on readmission diagnoses can be prone to underreporting. In spite of these limitations, this large propensity-matched study provides valuable evidence and is the closest step towards a large RCT since the 2005 FOOD trial.⁷

There are several possible explanations for poor outcome in people with DET insertion. First, those with DET feeding might have had more severe or longer-lasting dysphagia, both factors that the authors could not correct for during the matching procedure. Second, DET feeding might have increased the survival of severely affected individuals in the short term, in turn leading to poorer outcome in the long term. Yet the results remained robust even after matching for dependency at discharge. There is, however, a potentially more serious third explanation. Could DET feeding itself impair long-term outcome? This notion gains support from similarly poor results in PEG-fed patients in the randomized FOOD trial.⁷ DET feeding might restrict patients' mobility, impair their participation in rehabilitation, prolong institutionalization, and increase dependence on caregivers. People with DET insertion might be at higher risk of stress, depression, and local infections. More hypothetically, it is unknown whether clinicians and caregivers tend to be less proactive or less supportive in DET-fed patients compared to those with NGTs. All these factors could impair the prognosis of those with DET placement.

What do we learn from these findings? Interpretation of the results is, admittedly, difficult due to a number of possible confounders and alternative explanations. Expert panels will, nevertheless, need to incorporate these findings into their future recommendations for optimal feeding methods. Further research will need to elucidate the causes of poor outcome in people receiving DET feeding and develop strategies to prevent these complications. Finally, this study highlights the need for further sufficiently powered randomized controlled trials in dysphagic stroke.

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