

Percutaneous endoscopic gastrostomy versus nasogastric tube feeding during neurorehabilitation. *Ifs, ands, or buts*

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In a rehabilitation setting, dysphagia secondary to neurological disorders is considered to be one of the significant impairments affecting patient quality of life. Addressing deficits related to swallowing is a challenge for patients, health care providers, and caregivers. The anticipated delirious outcomes of dysphagia may not get optimal attention during acute care as the focus is mainly on the primary ailment. A slowly progressive and somewhat 'silent' complication of dysphagia is malnutrition which is a rampant condition affecting up to 40% of hospitalized patients.¹ Malnutrition can contribute to deconditioning, muscle wasting and cardiovascular dysfunction with consequential higher risks of thromboembolism, chest infection, and pressure sores.¹ These effects usually become obvious during the sub acute or rehabilitation phase of treatment and can significantly affect functional outcomes. They may even go unnoticed for months to years in underdeveloped health systems. Long-term nutritional deficits from dysphagia in neurological disorders remain less emphasized in inpatient settings. It is also an understated topic in medical education as well.

Enteral nutrition is indicated in patients with dysphagia due to neurological conditions including stroke, acquired brain injury (ABI), movement disorders, cerebral palsy, developmental disability, dementia, multiple sclerosis, amyotrophic lateral sclerosis, and cervical spinal cord injury (SCI).¹ However, patients with neurological ailments may require enteral feeding due to non-neurological indications as well. For instance, long-term enteral feeding may be needed in patients with associated anorexia, malabsorption, head, and neck cancers, or excessive catabolism.¹ Dysphagia can also occur as a result of various pharmacological and surgical interventions. In this report, we emphasize the need to consider percutaneous endoscopic gastrostomy (PEG) feeding as an alternate to nasogastric tube (NGT) feeding when long-term swallowing deficits are expected. It also highlights the rehabilitation challenges associated with PEG and NGT in patients with neurological disorders.

Risks associated with prolonged NGT include aspiration, ulceration, and infection in posterior cricoid region causing vocal cord dysfunction, pharyngeal discomfort, erosion of nares, epistaxis, sinusitis,

gastroesophageal reflux, gastritis, psychological trauma, and bronchopulmonary complications.² When a patient requires long-term enteral feeding (longer than 3-4 weeks) and there is a reasonable prospect of patient survival, consideration should be given to PEG tube placement.¹ The most frequent indication for PEG insertion is neurological disorders (58%).³ In the United States, there are approximately 123,000 PEG tube insertions performed annually; however, this is not necessarily the case around the world particularly in underdeveloped healthcare systems.⁴ Postulated factors contributing to this include limited resources, lack of expertise and training, and even lack of awareness to this alternative. Numerous studies have shown that PEG is associated with a lower probability of intervention failure, suggesting it is more effective and safe as compared to NGT.¹

Agitation and tube dislodgement. It is common for patients with ABI to remove their NG or PEG tubes due to agitation and impulsivity. With a NGT, evaluation for nasal congestion and the use of nasal decongestants can facilitate patient comfort and prevent a lot of frustration on behalf of the patient, family, and staff. Dislodgement of the NG or PEG tube can occur in neurorehabilitation due to agitation or during exercise therapies. One of the commonly overlooked aspects of NGT care is the mechanism of securing it. The NGT can be secured on the side of the face or above the ear. There is less urge to pull out the tube when the patient is not able to visualize it in front of the face or feel it swinging over the chest especially during therapy sessions. The rehabilitation staff should be aware of patients who have severe oropharyngeal dysphagia, poor cough or absent gag reflex. If the NGT is dislodged, the treating team may attempt a routine reinsertion of the tube without realizing the deficits of such patients leading to hazardous complications. Similarly, if the surgical history is not carefully reviewed before reinserting the NGT, the tube may lodge intracranially in patients with recent transnasal transphenoidal surgery. This is more likely to happen on a rehabilitation floor compared to neurosurgical floor where staff may not be well versed with such considerations. A PEG tube can be secured under an abdominal binder or with another external securing device instead of using restraints. When the NG or PEG tube is inadvertently removed during

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inpatient rehabilitation, the physician should ascertain the maturity of tract and act accordingly. If the PEG tube is removed, there is no surgical urgency unless the patient develops signs and symptoms of acute abdomen. An occlusive dressing over the stoma may prevent pneumoperitoneum. Reinsertion is not considered "successful management" as tube removal is preventable. Agitated or delirious patients who accidentally remove their PEG tube may be successfully managed with NG suction and PEG replacement. Maturation takes up to 3 weeks given that most patients are severely ill, malnourished, and generally present with poor wound healing. The PEG tract closes in 24-48 hours with or without NG suction. Subsequent placement of a PEG tube in a new site has to be considered. If a PEG tube is accidentally removed from a mature tract (>3-4 weeks old), a Foley catheter can be inserted to maintain tract patency, but this should not be attempted if the PEG tract is immature.⁵ Later a surgical team can be consulted for further management. If the problem of tube removal is recurrent, a Foley catheter may be left in place (in a mature tract) without further attempts to replace the PEG tube. Other options for replacement include Mic-Key, Pezzer, or Malecot gastrostomy tubes which can prevent side leakage at stoma site.

Pain and wound care. Unlike acute care where therapies are usually confined to a bed, patients in rehabilitation participate in several hours of therapy each day and PEG site pain and discomfort may result. Analgesics can be scheduled or offered as needed before therapy sessions to ensure comfort and to minimize pain and discomfort during movement. When selecting analgesics, consideration should be given to the cognitive side effects and compatibility with tube size. An abdominal binder can also provide comfort and support while performing therapies. In some situations, if the PEG stoma site is just inferior to the subcostal margins, the external bumper may fold onto skin while bending causing skin erosions and extreme discomfort. A protective dressing can be placed under the external bumper to avoid friction and to help with drainage. In patients wearing an abdominal orthosis for spinal disorders, it is possible to create a window in the thoracolumbar orthosis (TLSO) for routine care. It can also prevent kinking of the PEG tube or skin abrasions under the TLSO. A TLSO is supposed to be immobile, but some displacement can occur due to exercise, weight changes, and positioning. The measurements for creating a window in the TLSO should be taken accurately to avoid pulling or kinking of the PEG. Since patients with complete tetraplegia lack abdominal sensations, the signs, and symptoms of abdominal problems related to PEG tubes may not be obvious.

The assessment can be challenging especially if there are immediate complications after PEG placement. For example, abdominal guarding, tenderness, or rebound tenderness may not be reliable signs for peritonitis due to absent abdominal sensations and presence of spasticity, masking the signs of acute abdomen. On the other hand, it could be mistakenly perceived as "rigid abdomen." The rehabilitation physician plays a vital role in the assessment of acute abdomen in patients with SCI. Sudden autonomic changes and abnormal vital signs can reflect an impending emergency such as autonomic dysreflexia, especially if the abdominal examination is not reliable.

Appetite during neurorehabilitation. In neurorehabilitation, as dysphagia improves and oral diet is advanced, one of the more complex conditions to manage is loss of appetite. Careful reduction of the enteral feeding may facilitate improving appetite since appetite may be blunted due to enteral feedings. Patients with impaired cognition or communication may be unable to express themselves; thereby, posing a greater challenge to the treating team when evaluating appetite. For patients who maintain a poor oral intake, appetite stimulants may be used along with gradual tapering down the tube feeds. With improvement in swallowing, calorie counting can be considered to determine when the tube feeding can be discontinued. Since the nutritional demands of patients may vary due to increased activity during therapies, consultation with a dietician can help to establish a progressive nutritional plan. When appetite, endurance, strength, and dysphagia are improving, diet adjustments need to be made in a scientific, yet artistic, manner. The PEG placement may result in persistent dysphagia because there may be less incentive to intensively participate in speech therapy.³ The role of a speech and language pathologist is most crucial during neurorehabilitation because they have specialized knowledge, skills, and clinical experience related to the evaluation and management of neurogenic dysphagia.

In patients with ABI, apathy, poor initiation, and lack of attention can make nutritional management a real challenge. Assessment of appetite is also challenging if the patient is on dialysis, chemotherapy, narcotic medications, or has malignancy or gastrointestinal problems. Individuals with SCI have unique challenges. Within a few weeks of a SCI injury, a catabolic cascade is initiated resulting in nitrogen losses, loss of lean muscle mass, and decline in nutritional status. This renders the need to optimize nutrition from day one of injury. This may be easily overlooked as the focus is usually on management of SCI during acute care. Enteral feedings may be considered during the early

phase of treatment in patients with cervical SCI (CSCI) post spinal fixation or in patients with neurogenic dysphagia due to high CSCI. Patients with SCI are at increased risk of respiratory complications (especially aspiration) due to mechanical effects from CSCI or operative fixation, tracheostomy, dysphagia, ventilator impairments, impaired cough or prolonged immobility. The presence of NGT may serve as an additional risk factor for aspiration. In similar patients, an early PEG may be a better option for long-term feeding.

The PEG placement should always be given careful consideration based on the ethical, moral, religious, and legal requests of the patient and family. While it may be a suitable option in some instances, the risks, and benefits must be carefully weighed for patients in rehabilitation with terminal conditions, such as dementia, severe parkinson's disease, or malignancy. In dementia there is multitude of evidence that artificial nutrition does not improve quality of life.⁴ The rehabilitation physician must explain to the patient and caregivers that the long-term nutritional support by PEG tube may not overcome the long-term effects of chronic disease, immobility, and neurologic deficits.

Discontinuation of PEG tube. When the patient starts meeting nutritional requirements orally, the decision to remove the PEG has to be carefully made by holistically reviewing the patient's condition. If circumstances indicate that maintenance of oral nutrition may not be sustained after discharge from inpatient rehabilitation, the PEG tube may be left intact. Some patients with a PEG may make early swallowing recovery, and a speech, and language pathologist, or dietician may recommend discontinuing its use. In this situation, maturity of the PEG tract has to be ascertained carefully as discussed above. It is important to note that not all types of PEG tubes should be removed at bedside. The PEG tubes with rigid, fixed "bumpers" are removed endoscopically while PEG tubes with a collapsible or deflatable bumper can be removed using traction (pulling out the PEG tube through the abdominal wall). Instead of deferring for outpatient removal, the PEG tube may be preferably removed prior to discharge from rehabilitation. Since this is a common situation, rehabilitation physicians can perform this fairly simple procedure.

Effects on discharge disposition. Length of stay in rehabilitation centers and discharge disposition is a frequently faced problem for rehabilitation units. Patients with gastrostomy reportedly have earlier

discharge rates as compared to patients with NGTs bringing obvious financial benefits to the institution. Additionally, nursing facilities are likely to accept patients who are fed via gastrostomy rather than a NG tube because gastrostomy tubes are easier to manage. Families providing care at home after discharge from rehabilitation find providing enteral feeds via a PEG tube easier as well.

In conclusion, enteral nutrition is often necessary in patients with acute neurological disorders. NGTs are an excellent option in acute care when the duration of dysphagia is unknown. However, when dysphagia is prolonged or anticipated to be prolonged, early gastrostomy needs to be considered. In neurorehabilitation, the challenges involved in the management of enteral feeding are unique and problems pertinent to specific impairment groups deserve more attention in the literature.

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References

1. Gomes CA Jr, Lustosa SA, Matos D, Andriolo RB, Waisberg DR, Waisberg J. Percutaneous endoscopic gastrostomy versus nasogastric tube feeding for adults with swallowing disturbances. *Cochrane Database Syst Rev* 2010; 11: CD008096.
2. Makama JG. Uses and hazards of nasogastric tube in gastrointestinal diseases: An update for clinicians. *Ann Nigerian Med* 2010; 4: 37-44.
3. Goldhirsch SL. Feeding tube management. In: Chai E, Meier D, Morris J, Goldhirsch SL, editors. *Geriatric Palliative Care: A practical guide for clinicians*. New York (NY): Oxford University Press; 2014. P. 41.
4. Plonk WM Jr. Gastroenterologists should decline nonbeneficial PEG tube placements. *Am J Gastroenterol* 2005; 100: 2367.
5. Potack JZ, Chokhavatia S. Complications of and controversies associated with percutaneous endoscopic gastrostomy: report of a case and literature review. *Medscape J Med* 2008; 10: 142.