

## Percutaneous Endoscopic Gastrostomy in ICU setting using Portable endoscope

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### I. Introduction

'Disability' has a great impact on the patient and the family with gross implication on the economy with need of specialist care and neuro-rehabilitation and palliative care. This leads to stress over need of special care givers and training for the same urging the need of care methods.

One of the most important aspects of patient care is the nutritional requirement. Critically ill patients are at a constant risk of malnutrition. Trauma and inflammation induce stress-related catabolism, and drug-induced adverse effects may reduce appetite or increase nausea and vomiting<sup>(1)</sup>. Patient management in the intensive care unit (ICU) may also interrupt feeding routines<sup>(2,3,4)</sup>

In particular, certain types of dietary factors, such as omega-3 fatty acids, can increase production of molecular systems that serve synaptic function, while diets rich in saturated fats do the opposite<sup>(5)</sup>. The overall evidence indicates that diet and exercise are two noninvasive approaches that can be used to improve molecular mechanisms of neural repair after brain surgery/ trauma, by working through Brain-Derived Neurotrophic Factor (BDNF)<sup>(6)</sup>.

Patients on mechanical ventilator support require higher nutritional support<sup>(7)</sup>. Percutaneous endoscopy gastrostomy (PEG) is generally used when there is a need for enteral nutrition for a longer time period<sup>(8)</sup>. There is a high demand for PEG in patients with swallowing disorders due to various causes and neurologically deficit patients. The patients selected for the study were limited in their mobility either due to requirement of ventilator support or vasopressor support.

Enteral nutrition is considered to be more physiological, economical, restore gastro-intestinal functions early, reduces total stay in hospital and reduces the risk of infectious complications as compared to parenteral nutrition in critically ill patients

### II. Aim

To study the placement of PEG using portable endoscope in an ICU in critically ill patients with neurological impairment.

### III. Material and methods

Inclusion criteria: informed and documented consent, tracheostomy, and difficulty in swallowing due to neurological component

Exclusion criteria: non-consenting attendants, maxillofacial injury and oral intubation.

Materials: portable endoscope, PEG kit (including the tube, scalpel, fixator and thread), syringe, local anaesthetic and sterile gloves within the ICU setting.

20 patients, 8 males and 12 females with median age, which were admitted in the intensive care unit of Subharti Medical College and hospital, underwent PEG in a bedside setting using a portable endoscope.

The procedure was carried out in the ICU using the portable endoscope with the anaesthesiology team for sedation, if required. A 20 Fr or 24 Fr tube was inserted by the 'pull' technique after complete gastro-endoscopy.

By the 'pull' technique, the endoscope was introduced orally, the stomach to localize the best point to place the tube.

Next, a trocar was pushed through the skin into the stomach at the location identified by the illumination by the endoscope. A pull thread was introduced into the stomach and grasped by forceps. The endoscope was slowly withdrawn until the thread appeared at the mouth, and fixed to the PEG tube and introduced through the mouth

into the stomach; appeared from inside of the stomach and out of the stoma created by the initial trocar incision and fixed.

#### IV. Result

PEG performed in 20 patients with mean age of 55.4 years (range from 30 years to 82 years) with a gender distribution of 8 males and 12 females. The distribution comprised of 8 patients of head injury, 7 cases of CVA and 5 episodes of sepsis. The average procedure duration was 36.5 minutes, ranging from 20 minutes to 45 minutes with intra procedural difficulty in 3 patients and complication of broken tooth in 2 patients and other oral cavity injury in 1 patient. Failure and procedure related mortality was seen in 0 patients.

#### V. Conclusion

In the selected patients, PEG could be placed by a portable endoscope in an ICU setting with no major complications.

#### VI. Discussion

Neurological disorders are increasingly recognised as major causes of death and disability worldwide. Globally, in 2016, neurological disorders were the leading cause of DALYs (276 million)<sup>(9)</sup>. There is growing evidence worldwide for the effectiveness of community based neuro-rehabilitation in this group.<sup>(10)</sup>

The nutritional management of neurological patients is crucial, and enteral feeding is commonly used to provide nutritional support.<sup>(11)</sup>

**Fei Zhou et al (2017)**<sup>(12)</sup> demonstrated the nutritional status of PEG fed patients. Symptoms of nausea and vomit, abdominal distension, and other presenting signs of malnutrition were improved; water-electrolyte imbalance and negative nitrogen balance were corrected. In their study upon PEG nutrition demonstrated that the incidence of hyponatremia, hypocalcemia and hypokalemia decreased by 61.25% (81.25% vs. 20.00%); the frequency of transient hypoglycemia was lower than pre-operation (43.75% vs. 5.00%).

Historically, safety in the gastrointestinal (GI) endoscopy unit has focused on infection control, particularly around the reprocessing of endoscopes<sup>(13)</sup>. We observed that in an ICU set up, the safety could be maintained.

The patients could be taken up on a comprehensive diet post procedure, due to the wider lumen of a PEG tube. This lead to a healthier gastro-intestinal tract and faster recovery.

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