Background: Percutaneous gastrostomy (PEG) has become a key element in managing children with nutrition or feeding issues. Reversal of malnutrition shortly after gastrostomy has been shown in many pediatric studies, however literature on maintenance of nutritional status following initial catch-up growth is limited.

Aims: To analyze the long-term follow-up of children with PEG in terms of nutritional outcomes as defined by improvement in weight-for-height $z$ scores.
To review the procedure-related complication rates specific to our center.

Methods: This is a retrospective review of all PEG procedures performed at our tertiary Children's Hospital from 1999 to 2015. All PEGs were placed by the same team of pediatric gastroenterologists using the standard pull technique. Prophylactic antibiotics were given for 24h. Nutritional outcomes were evaluated by comparing the weight-for-height $z$ scores (CDC growth charts) at the time of tube placement and either at the time of last follow-up for children receiving gastrostomy feeding, or at the time of tube removal, fundoplication or death. PEG-related complications were recorded.

Results: In the 256 patients who underwent successful PEG placement, diagnoses were as follow: neuromuscular disease (n=136, 53%), cystic fibrosis (n=30, 12%), metabolic disease (n=18, 7%), chromosomal abnormalities/genetic syndromes (n=18, 7%), nonorganotic failure to thrive (n=39, 15%) and other (n=15, 6%). Median age at the time of PEG placement was 3.9 years (0.4-19.9 years) and median follow-up duration was 3.2 years (0-16 years). Significant improvement in weight-for-height $z$ score was reported for all subgroups except for the "metabolic disease" and "other" subgroups: neuromuscular disease ($\Delta=0.62$, $P=0.0008$), cystic fibrosis ($\Delta=0.8$, $P=0.004$), metabolic disease ($\Delta=0.37$, $P=0.4$), chromosomal abnormalities/genetic syndromes ($\Delta=1.01$, $P=0.01$), nonorganic failure to thrive ($\Delta=0.7$, $P=0.005$). A total of 61 complications were reported: 35 cellulitis including 17 requiring intravenous antibiotics, 16 accidental dislodgements, 7 buried bumper syndromes, and 2 perforations. A total of 123 patients had known reflux prior to PEG placement, while 39 (32%) had resolution of symptoms, 84 (68%) had persistent reflux with 18 requiring fundoplication.

Conclusions: Our study illustrates that improvement in nutritional status following PEG is maintained during the long term, reinforcing the benefits of gastrostomy feeding when enteral nutrition is required. PEG is a safe method to provide enteral feeding in children. Future studies defining preoperative clinical factors to help clinicians to predict which patient populations are at higher risk of poor nutritional rehabilitation, complications or need for anti-reflux surgery are needed.
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