Jejunal feeding for an elderly man with advanced Parkinson’s disease

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ABSTRACT
A 78-year-old man with advanced Parkinson’s disease presented with dysphagia, fever, and a history of recurrent aspiration pneumonia. Nasogastric tube feeding, percutaneous endoscopic gastrostomy (PEG) feeding, and continuous, pump-controlled, slow-drip formula feeding failed to solve the problems completely. PEG with jejunal extension was undertaken and successfully prevented recurrent aspiration.

Key words: Deglutition disorders; Enteral nutrition; Jejunum; Parkinson disease

INTRODUCTION
Swallowing difficulty, or dysphagia, is associated with ageing and results from various co-morbid medical conditions. Dysphagia confers a major risk of aspiration pneumonia and malnutrition in frail older people.¹² Oropharyngeal dysphagia is a common complication of Parkinson’s disease; it affects quality of life and is associated with high morbidity and mortality.³ It is also associated with other gastrointestinal motility disorders such as gastroparesis and constipation,⁴ making management of dysphagia in patients with Parkinson’s disease difficult.⁵ We report on an elderly man with dysphagia secondary to advanced Parkinson’s disease requiring jejunal feeding.

CASE REPORT
In February 2011, a 78-year-old man with advanced Parkinson’s disease and levodopa-induced psychosis was admitted for aspiration pneumonia. He was taking multiple medications including L-dopa, domperidone, rotigotine transdermal patch, entacapone, rivastigmine, and quetiapine. He had been cared for by his wife and 2 maids. He had increasing difficulty in swallowing and had significant weight loss. One year earlier, he was determined to be at risk of aspiration during swallowing, and a chin-down posture and double swallowing technique were advised, as was dietary modification including eating a minced diet and adding thickener into liquid. His Parkinson’s disease medications were titrated by a neurologist to ensure that he was in the on-motor phase during feeding. Domperidone was added to improve gastric emptying, as gastroparesis can also associate with dysphagia in Parkinson’s disease.

His chest radiographs showed bilateral lower zone haziness. Total white cell count was raised with an increased neutrophil count. Video fluoroscopic swallowing study (VFSS) showed that he had severe silent aspiration and was not suitable for any oral feeding. Nasogastric tube intermittent feeding was commenced, and the patient was discharged to a residential care home for the elderly (RCHE) after his pneumonia improved.

One month later, he was admitted for aspiration pneumonia again. In view of the high risk of recurrence, continuous pump feeding instead of bolus feeding was started. He was sent home after
his chest condition improved. Four months later, he was admitted again. Complete blood count showed normal white cell count. Sputum culture yielded *Pseudomonas aeruginosa*. The patient continued to have fever after repeated courses of broad-spectrum anti-pseudomonal antibiotics. His fever subsided whenever nasogastric feeding ceased. A gastroenterologist was consulted and percutaneous endoscopic gastrostomy (PEG) was performed. The possibility of a further procedure of PEG with jejunal extension (PEG-J) was also discussed, should PEG fail to prevent aspiration.

Despite PEG feeding at a slow rate of 50 ml per hour, aspiration and fever continued to recur. Accordingly, guidewire-assisted insertion of PEG-J was performed. Jejunal feeding was started at 50 ml per hour, which the patient tolerated it well. To build up nutrition, the volume was later increased to 65 ml per hour as suggested by the dietitian. However, the patient had fever again. Fluoroscopy with contrast confirmed that the jejunal tube was in good position, but that the patient had paresis of gastrointestinal tract with reflux of contrast to the upper part of duodenum and stomach. Jejunal feeding was reduced to the rate of 50 ml per hour, and the patient was subsequently discharged to RCHE and followed up by the Hong Kong West Community Geriatric Assessment Team.6

In the RCHE, frequent blockage of the jejunal tube was noted, so the gastric and jejunal tubes were flushed with 50 ml of water every 4 hours to maintain patency. Carbonated water was used once a day to flush the jejunal tube and prevent blocking. Continuous, pump-controlled, slow-drip formula feeding was given via the jejunal tube, whereas medications via the gastric tube (Figure). Isosmolar (rather than hyper-osmolar) formula was given at a rate of 50 ml per hour for 24 hours a day. Dispersible Madopar (Roche, Basel, Switzerland) and syrup domperidone were given instead of the usual tablet preparation. Rivastigmine and rotigotine transdermal patches were used. Other tablet medications were crushed thoroughly and filtered before administration. No more blockage of the tube occurred. The rate of feeding was gradually increased to 60 ml per hour 4 weeks after discharge. The patient remained afebrile and tolerated the PEG-J feeding well. He was scheduled to change the PEG-J one year later.

**DISCUSSION**

According to the American Speech and Hearing Association, the prevalence of dysphagia in individuals aged over 60 years can be as high as 14%. For elderly home residents, the prevalence is even higher, ranging from 30 to 75%.7,8 Parkinson’s disease is associated with gastrointestinal motility disorders, namely oropharyngeal dysphagia, gastroparesis, and constipation.9 The prevalence of oropharyngeal dysphagia in patients with Parkinson’s disease can be as high as 82%, whereas the prevalence of gastroparesis remains unclear.10 The management of oropharyngeal dysphagia includes the use of a chin down posture in eating, diet modification, adding thickener to liquid, and a multiple swallowing technique. In addition, titration of L-dopa and timing of medications is important to ensure that the patient is in the on-motor state during eating. VFSS enables accurate assessment of the oropharyngeal and esophageal phase during swallowing. Scintigraphy, breath test, ultrasonography, and magnetic resonance imaging have all been used.11,12 There is no consensus on the optimal management of gastroparesis for gastric emptying delay. Gastroparesis can lead to nausea, vomiting, and belching sensation. It prevents adequate resorption of L-dopa by delaying its transport to the small bowel for absorption. In our patient, domperidone was given to improve gastroparesis.13

When oral feeding is deemed unsuitable, non-oral feeding (enteral or intravenous feeding)
should be used. Enteral feeding can be through a nasogastric, PEG, PEG-J, or direct percutaneous endoscopic jejunostomy (D-PEJ) tube. Intravenous feeding involves the use of total parenteral nutrition. For nasogastric feeding, aspiration of gastric contents may result in pneumonia. Interventions to prevent aspiration include elevation of the head of the bed to >30°, use of iso-osmolar (rather than hyper-osmolar) formulas to prevent delayed gastric emptying, use of prokinetics, continuous pump feeding, and restriction of night feeding.18 Although continuous nasogastric pump feeding is associated with lower gastric residual volume than intermittent nasogastric bolus feeding, there is no significant difference in complication rates including pneumonia.15,16

In a review of studies comparing nasogastric feeding with PEG feeding,17 the failure rates were 39.9% and 12.2%, respectively. There is no significant difference in terms of the rates for mortality, pneumonia, other complications, and functional ability. Nonetheless, PEG feeding may prevent gastroesophageal reflux.18

For jejunal feeding, D-PEJ involves direct insertion of a feeding tube into the jejunum. This provides a more stable access for jejunal feeding. PEG-J involves a smaller calibre tube passing through the gastrostomy tube and advanced through the stomach into the jejunum. Hence, the PEG-J contains a gastric tube and a jejunal tube. The PEG-J enables continuous jejunal feeding and simultaneous decompression of the stomach through the gastric tube. This may enhance gastric emptying and reduce the risk of aspiration. PEG-J decreases the risk of aspiration in patients with reflux oesophagitis, previous aspiration, gastric paresis, or diminished gag and cough reflexes, but dumping syndrome may occur more frequently in PEG-J.19 The advantages of D-PEJ include less proximal tube migration into the stomach and longer tube patency. However, the success rate after insertion was lower for D-PEJ than PEG-J (72.7% vs. 92.5%). D-PEJ does not allow for simultaneous gastric decompression and has a higher risk of aspiration.20 Continuous, pump-controlled, slow-drip formula feeding (rather than intermittent bolus feeding) is preferred for PEG-J or D-PEJ. Aspiration may still occur with jejunal feeding if the rate of formula infusion is too fast. The feeding rate should be adjusted by balancing tolerability and nutritional requirements. Blockage of the jejunal tube is common, as it has a small calibre (usually 9F). Frequent flushing with water is important to prevent blockage; carbonated water may help dissolve any clotted formula in the tube and maintain its patency. To reduce the chance of blockage, medications can be given via the gastric tube instead of the jejunal tube. Tablets should be changed to syrup or transdermal form if feasible. Tablets should be crushed thoroughly and filtered before administration. PEG-J and D-PEJ are more costly as they require the intervention of a gastroenterologist. The mandatory use of pump feeding incurs higher costs than bolus feeding.

Many RCHE staff in Hong Kong do not have experience in caring for patients with gastrostomy or jejunal tubes. Adequate training of carers is vital in preventing complications. The Community Geriatric Assessment Team plays a vital role in the provision of training and management support to RCHE patients with gastrostomy and jejunal tubes. In the Hong Kong West Cluster, many nurses of the Community Geriatric Assessment Team are trained to replace PEG tubes at the bedside. In addition, they provide education for RCHE staff in the daily care of the gastrostomy and jejunal tubes. When the PEG-J or D-PEJ tube is blocked and cannot be reopened by flushing, a carefully selected guidewire can be used to reopen the blocked tubes. If all means failed to reopen the tubes, the PEG-J or D-PEJ tube needs to be replaced endoscopically by a gastroenterologist.

REFERENCES
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