The Heart Surgery Forum #2015-1411
19 (1), 2016 [Epub February 2016]
doi: 10.1532/HSF98.20151411

Online address: http://www.hsforum.com

Percutaneous Endoscopic Gastrostomy Tube in a Syncardia™ Total Artificial Heart

Amit Prasad, MD,[1] Kai Singbartl, MD, MPH,[1] Jacqueline Boone, CRNP,[2] Behzad Soleimani, MD,[2] Mohamad Zeriouh, MD,[3], M. Loebe, MD, PhD,[4] Michael M. Koerner, MD, PhD,[4] J. Elisabeth Oei, MD,[5] Christoph E. Brehm, MD,[2] Ali Ghodsizad, MD, PhD, FETCS, FACC[2]

[1]Pennsylvania State University College of Medicine Department of Anesthesiology and Perioperative Medicine, Hershey, Pennsylvania, USA; [2]Pennsylvania State University College of Medicine Heart and Vascular Institute, Hershey, Pennsylvania, USA; [3]Department of Cardiothoracic Transplantation and Mechanical Circulatory Support, Harefield Hospital, Royal Brompton and Harefield NHS Foundation Trust, London, United Kingdom; [4]INTEGRIS Baptist Medical Center, Oklahoma City, Oklahoma, USA; [5]Syncardia Systems Tuscon, USA

ABSTRACT

As a bridge to transplant, the Syncardia™ total artificial heart (TAH) is an option for patients who are not candidates for left ventricular assist devices (LVAD) due to right ventricular failure. The need for nutritional support in these patients is essential for a favorable outcome. Low body mass indexes and albumin levels have been associated with increased morbidity and mortality in cardiac surgery patients [Alverdy 2003]. It is not uncommon for postoperative patients to have difficulty in consuming enough calories after surgery, which is further complicated by a hypermetabolic demand due to surgical stress. Enteral nutrition has typically been favored for gut mucosal integrity and bacterial flora [Alverdy 2003] [Engleman 1999]. We describe the need for prolonged enteral nutritional support in a TAH patient that was accomplished with a percutaneous endoscopic gastrostomy (PEG) tube.

CASE REPORT

A 50-year-old man with a history of non-ischemic cardiomyopathy, an ejection fraction of 5-10%, akinesis in inferior and lateral walls, severe right ventricular (RV) dilation, and reduced RV systolic function was admitted to the heart and vascular critical care unit with an Impella left ventricular assist device. After review of the echocardiography and discussion with cardiothoracic surgery colleagues, it was decided that he was a candidate for a Syncardia™ 70 milliliter total artificial heart due to the severe RV failure. Postoperative course was complicated by a right frontal cerebral vascular accident on postoperative day (POD) 5, and prolonged intubation for 15 days due to recurrent pulmonary effusions and hypoxemia. He was extubated on POD 15 and had a chest tube placed on POD 18 for effusions. He was being enterally fed via a Corpak™ nasogastric tube. On post-extubation day 4, he failed a swallow study with speech therapy. On post-extubation day 18, he had a barium swallow study that was concerning for aspiration. Otolaryngology service found no vocal cord dysfunction that could explain the consistent aspiration. A month and half after extubation, he started developing recurrent nasal hemorrhages at the site of the Corpak™. This was further complicated by occasional removal of the Corpak™ by the patient due to both ICU delirium and inhibition from his frontal stroke. After repeated failed swallow

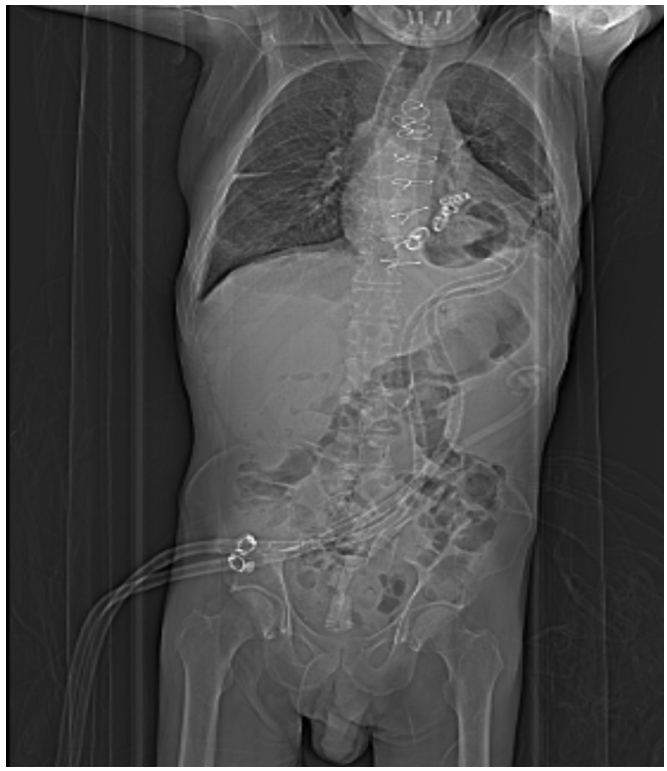

Figure. CT scan of patient with percutaneous endoscopic gastrostomy (PEG) tube with total artificial heart.

Received November 11, 2015; accepted December 18, 2015.

Correspondence: Ali Ghodsizad MD, PhD, FETCS, Assistant Professor of Surgery Director of Mechanical Circulatory Support Research, Penn State Milton S. Hershey Medical Center Heart & Vascular Institute, 500 University Drive Hershey, PA 17033; 717-635-5229 (e-mail:aghodsi@gmx.org).

studies and repeated treatment of nasal bleeding by otolaryngology, it was determined that he needed a PEG tube. Due to the proximity of the drive lines, concern for infection, and no clear window on CT scan for placement, the patient was denied by two different surgical services. Thoracic surgeons decided to place the PEG tube for both comfort and recurrent nasal bleeding. The patient has done well with this PEG tube and continues to fail his repeat swallow studies. His nasal bleeding has stopped and he states that the PEG tube is more comfortable than the Corpak™.

DISCUSSION

The primary concern with placement of the PEG tube was infection that would spread to the drive line sites. It has been reported, even with surgical antibiotic prophylaxis, that the infection rate is about 3% [Preclik 1999; Dormann 2000]. Necrotizing fasciitis is a rare but life-threatening complication and patients who are malnourished and have impaired immune systems are at greater risk [Greif 1986; Person 1986]. Furthermore, the PEG insertion site is usually in the left upper quadrant of the abdomen, which is in close proximity to the drive lines needed to power the TAH.

Indication for PEG tube placement includes long-term nutritional support in patients that have lost the ability to swallow [McClave 2006]. Typically, nasogastric tubes are for short-term (<30 days) enteral support. It has been shown that PEG tubes can improve nutritional status and help with weight gain in the chronically ill patient [Park 1993]. Furthermore, meta-analysis has shown that a PEG tube is associated with lower intervention failure, which suggests it is safer and more effective than a nasogastric feeding tube in patients with dysphagia [Gomes 2015].

There has been only one other documented case of placing a PEG in a patient with cardiac device support, and that was a patient with an LVAD [Slaughter 2003]. It has not been reported in regard to PEG placement in a patient with TAH. Placing a PEG tube in a patient with a total artificial heart should be considered only in extreme situations. Our patient's postoperative dysphagia was not only complicated by prolonged intubation but also a stroke. It took him failing 4 different swallow studies over 8 weeks, along with recurrent nasal hemorrhages, and multiple placements of Corpak™ due to self-removal before a PEG tube was considered. We were able to successfully place a PEG tube in this patient with a TAH and his nutritional status has continued to improve. He continues to gain weight and strength, and is more comfortable and satisfied with the PEG than the Corpak™ nasogastric tube.

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