- What prophylactic treatments are effective in limiting complications from postoperative swallowing abnormalities?
- Are there high-risk patient subgroups, based either on the characteristics of operation or on recognized risks for swallowing abnormalities, that are candidates for extra precautions to limit complications of swallowing dysfunction after cardiac operations?
- Is it possible that alternative, less-invasive procedures can limit oropharyngeal dysphagia in certain high-risk patients undergoing cardiac procedures?⁵
- Does early postoperative endoscopic and swallowing assessment diagnose and limit complications of oropharyngeal dysphagia?

Plowman and colleagues deserve some credit for bringing the risks of oropharyngeal dysphagia to the consciousness of cardiac surgeons. There is much work to do

to define high-risk populations and to devise treatment plans to limit intraoperative and early postoperative swallowing difficulties.

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Commentary: Postoperative esophageal function: Important lessons for cardiac surgeons to swallow

Robert B. Cameron, MD

There is perhaps no more universally held surgical doctrine than the belief that esophageal dysfunction leading to aspiration is one of the sources, if not the single greatest sources, of morbidity and mortality in both intensive care unit (ICU)

Robert B. Cameron, MD

CENTRAL MESSAGE

Some degree of esophageal dysfunction is present in >90% of postoperative cardiac surgery patients, necessitating careful attention to contributing factors and postoperative functional evaluation.

and surgical patients. This is particularly true in cardiothoracic surgery.^{1,2} The complex nature of esophageal dysfunction integrates abnormalities not only of “forward-flow” (oropharyngeal dysphagia), but also of “backflow” (gastroesophageal reflux). Aggravating factors include sedating medications, intubation-associated oropharyngeal trauma,

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pharyngeal atrophy, respiratory dyssynchrony, and loss of an effective cough reflex.¹⁻³

Unfortunately, esophageal function is not as easily measured in real time as the functions of other intrathoracic organs. Therefore, when dysfunction occurs, it is more often occult until a catastrophic event occurs, such as aspiration pneumonia. Despite the gravity of postoperative esophageal dysfunction, the number of prospective high-quality studies is relatively limited.

In this issue of the *Journal*, Plowman and colleagues¹ provide outstanding prospective, single-center data on postoperative swallowing function/dysfunction in 182 cardiac surgery patients who had no prior swallowing symptoms by history and on assessment with the swallowing screening tool Eating Assessment Tool (EAT)-10.¹ Routine postoperative fiberoptic endoscopic evaluation of swallowing (FEES) utilized progressive food consistencies from liquid to solid. The validated 8-point Penetration-Aspiration Scale and 5-point Yale Pharyngeal Residue Severity Rating Scale were scored by 2 independent, blinded speech-language pathologists. Risk factors identified include New York Heart Association class III-IV heart failure, reoperation, endotracheal tube (ETT) size ≥ 8 (regardless of gender), prolonged intubation >27 hours, and extensive transesophageal echocardiography (TEE) probe manipulation (surrogate = image number >110). Patients with ≥ 3 or ≥ 4 risk factors had 16.4-fold and 22.4-fold higher odds of aspiration, respectively. Most notably, only 11 of 182 patients (6%) were classified as “safe!” Tracheal aspiration was documented in 53/182 (29%), whereas the remaining 118/182 (65%) had some element of laryngeal penetration. Furthermore, 45 aspirating patients (85%; 25% of 182) exhibited an ineffective cough in response to tracheal penetration, and 28 (53%; 15% of 182) had “silent” aspiration without any cough response. Aspirating patients experienced worse outcomes, with increased odds of pneumonia (2.6), reintubation (5.7), and death at 90 days (2.8). Despite waiting 43% longer to restart oral intake, these patients required

>4 -day longer ICU and 6-day longer hospital stays while incurring \$49,372 additional hospital expenses.

It is disturbing that some degree of swallowing dysfunction was almost universally present (94%) in cardiac surgery patients, even in those without preexisting esophageal symptoms. This finding alone may justify the use of routine postoperative FEES. However, since preoperative swallowing evaluations (with or without FEES) were not performed (a study weakness), it is actually impossible to determine how much of the observed swallowing dysfunction was an unrecognized preexisting problem versus a consequence of surgery. Addressing this question will be crucial in future studies. Furthermore, preoperative detection of swallowing dysfunction may facilitate earlier, more beneficial interventions than are possible postoperatively alone, preventing or at least reducing related complications. Use of a preoperative esophageal “stress FEES” (analogous to a preoperative “stress echocardiogram”) can be imagined. Granted, the number and effectiveness of esophageal therapeutic interventions (beyond nil per os prolongation with or without total parenteral nutrition/feeding tube) pale in comparison to coronary interventions, but some do exist.^{4,5} Limiting TEE manipulations and using smaller ETT size are 2 such factors from the current study. With additional research, more will no doubt be identified.

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