

Discriminant Ability of the 3 Ounce Water Swallow Test to Detect Aspiration in Cardiac Surgical Patients.

Kelly Leonard, Justine Allen, Amber Anderson, Eric Jeng, Thomas Beaver, Emily Plowman.

COLLEGE OF PUBLIC HEALTH & HEALTH PROFESSIONS.

BACKGROUND:

- Dysphagia is a common complication of cardiothoracic surgical procedures associated with delayed return to oral intake, malnutrition, reintubation, pneumonia, increased cost and length of hospital stay.¹⁻⁴
- Early detection of swallowing impairment is therefore critical to mitigate the development of these sequelae and underscores the need for a rapid sensitive screening tool for this clinical setting.
- The 3 oz Water Swallow Test (WST) is a validated simple screening tool for use in general pediatric⁵ and adult⁶ hospitalized patients that is noted to demonstrate >96% sensitivity to detect aspiration.
- The utility of the 3 oz WST to detect aspiration in hospitalized postoperative cardiothoracic patients has not yet been determined.

AIM:

Determine the sensitivity and specificity of the 3 oz WST to detect aspiration in postsurgical cardiothoracic patients.

METHODS:

Demographics:

- 197 adults who had undergone a cardiothoracic procedure and in the Cardiac Intensive Care Unit (CICU) were enrolled in this study.
- Participants underwent the 3 oz Water Swallow Test (WST) and Fiberoptic Endoscopic Evaluation of Swallowing (FEES).
- Participants were seen \leq 72 hours of extubation, on room air or LFNC oxygen and had confirmed absence of delirium as verified by a score of 0-2 on the Confusion Assessment Method for the ICU.

Table 1. Patient Demographics.

	Mean:	SD:	Range:
Age (years)	63	12.8	19 - 88
Body Mass Index	30	6.4	16 - 57
EuroSCORE II	9.5	9.4	0.29 - 44
STS Risk Score	2.1	2.0	0.25 - 13

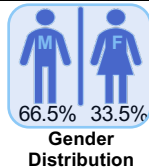


Fig 1. New York Heart Association Score

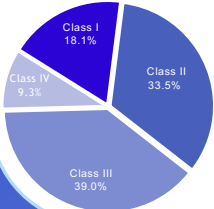


Table 2. Primary Surgical Procedure.

Procedure:	%:
CABG, Valve	38%
Aortic Root	7%
Aortic Arch	42%
LVAD, Transplant	5%
Transcath', Endo'	5%
MAZE, ASD, VSD	3%

Procedures and Outcomes:

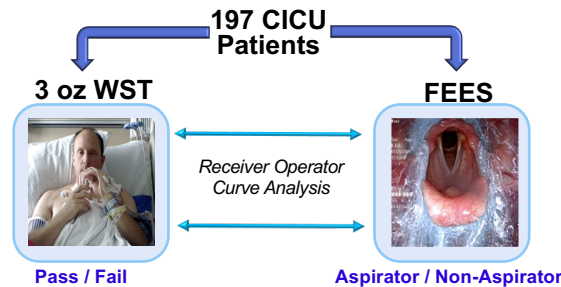
3 oz WST:

Patients were given 90cc water, instructed to drink without stopping.

- PASS: uninterrupted completion with no cough or throat clear.
- FAIL: interrupted drinking, cough or throat clear.

FEES:

- Standardized bolus protocol (x2 5cc, x2 10cc, x2 comfortable cup sip, x2 teaspoon pudding, x2 bite of saltine cracker, x3 M&Ms).
- Two independent blinded raters analyzed each swallow.
- Penetration Aspiration Scale (PAS).
- Aspirators: PAS \geq 6 vs. Non-Aspirators: PAS \leq 5.



RESULTS:

3 Ounce Water Swallow Test Profiles:

Pass:	Fail:
55%	45%

Aspiration Profiles in Cardiothoracic Patients:

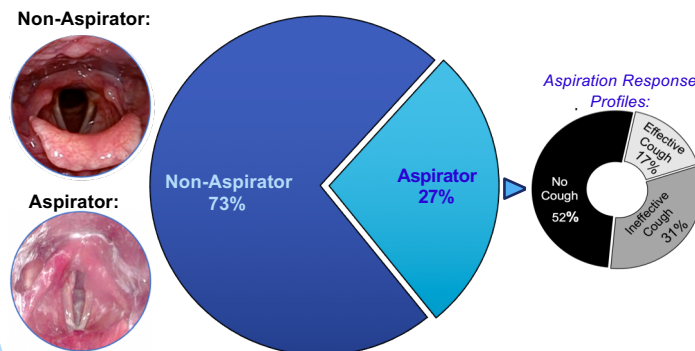
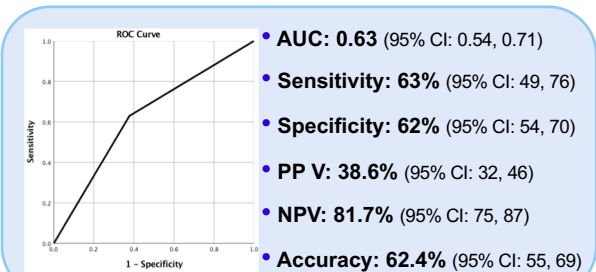


Fig 2. Aspiration occurred in 54 patients (27%), with silent aspiration representing the most common response pattern to tracheal aspirate (52%). Seventy three percent of patients did not aspirate.

Clinical Utility of the 3 Ounce WST:

Table 3. Two-by-Two Contingency Table Denoting Relative Frequency of Aspiration and Testing Status.

		FEES:		
		+	-	
3 oz WST:	Fail	34 (True +)	54 (False +)	n=88
	Pass	20 (False -)	89 (True -)	n=109
		n=54	n=143	



CONCLUSIONS:

- The 3 oz WST misclassified aspiration status in approximately one-third of cardiothoracic patients. Therefore these results do not support the use of the 3 oz WST *in isolation*, in this patient population.
- The observed high rate of 'silent' aspiration in this study and by others⁷ may provide an explanation for the observed reduced sensitivity of the 3 oz WST to detect aspiration in cardiothoracic patients given that it utilizes the presence of a cough or throat clear as part of the fail criteria.
- Our findings suggest that additional clinical tests indexing the physiologic capacity of a cardiothoracic patients' ability to swallow safely are warranted to accurately screen dysphagia.
- We are currently examining additional bedside assessment techniques to triage high-risk patients for further comprehensive instrumental evaluation of swallowing.

References:

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