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Post-extubation dysphagia in trauma patients: it's hard to swallow

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Dysphagia;
Trauma;
Postextubation;
Aspiration;
Swallow evaluation

BACKGROUND: There is a significant incidence of unrecognized postextubation dysphagia in trauma patients. The purpose of this study was to evaluate the incidence, ascertain the risk factors, and identify patients with postextubation dysphagia who will require clinical swallow evaluation.

METHODS: A prospective observational study was performed on 270 trauma patients. Bedside clinical swallow evaluation was done within 24 hours of extubation. Logistic regression analysis was used to adjust for confounding variables.

RESULTS: The incidence of oropharyngeal dysphagia (OD) in our study was 42%. Ventilator days was the strongest independent risk factor for OD (3.6 vs 8.0, $P < .001$). The odds ratio showed a 25% risk for OD for each additional ventilator day. Silent aspiration was found in 37% of patients with OD.

CONCLUSIONS: Trauma patients requiring mechanical ventilation for ≥ 2 days are at increased risk for dysphagia and should undergo routine swallow evaluations after extubation.

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Dysphagia is defined as difficulty or inability to swallow. In patients requiring endotracheal intubation for mechanical ventilation, swallowing function is often temporarily impaired after removal of the endotracheal tube. The described incidence of postextubation dysphagia (PED) in a mixed medical and surgical population ranges from 3% to 62%.¹ PED results from both mechanical and cognitive mechanisms. Mechanical causes are related to the endotracheal tube and include mucosal abrasion, laryngeal edema, and decrease in laryngeal sensation. Cognitive mechanisms include traumatic brain injury or critical illness, which can lead to decreased coordination of the swallowing reflex.² Consequences of PED include aspiration of

oral secretions, food, and liquids, leading to pneumonia with resultant prolongation of hospital stay and increased mortality.³ Martino et al⁴ showed that the risk for developing pneumonia is 11 times greater in adult patients with stroke who aspirate compared with those with no aspiration, leading to increases in mortality and hospital cost. We hypothesized that there is a significant incidence of unrecognized PED in trauma patients. The purpose of this study was to evaluate the incidence of dysphagia in recently extubated trauma patients, to ascertain risk factors for dysphagia, and to identify trauma patients at high risk for PED, including those with silent aspiration, who will benefit from clinical swallow evaluation (CSE) and intervention.

Methods

A prospective observational study was performed, at an American College of Surgeons–verified level 1 trauma

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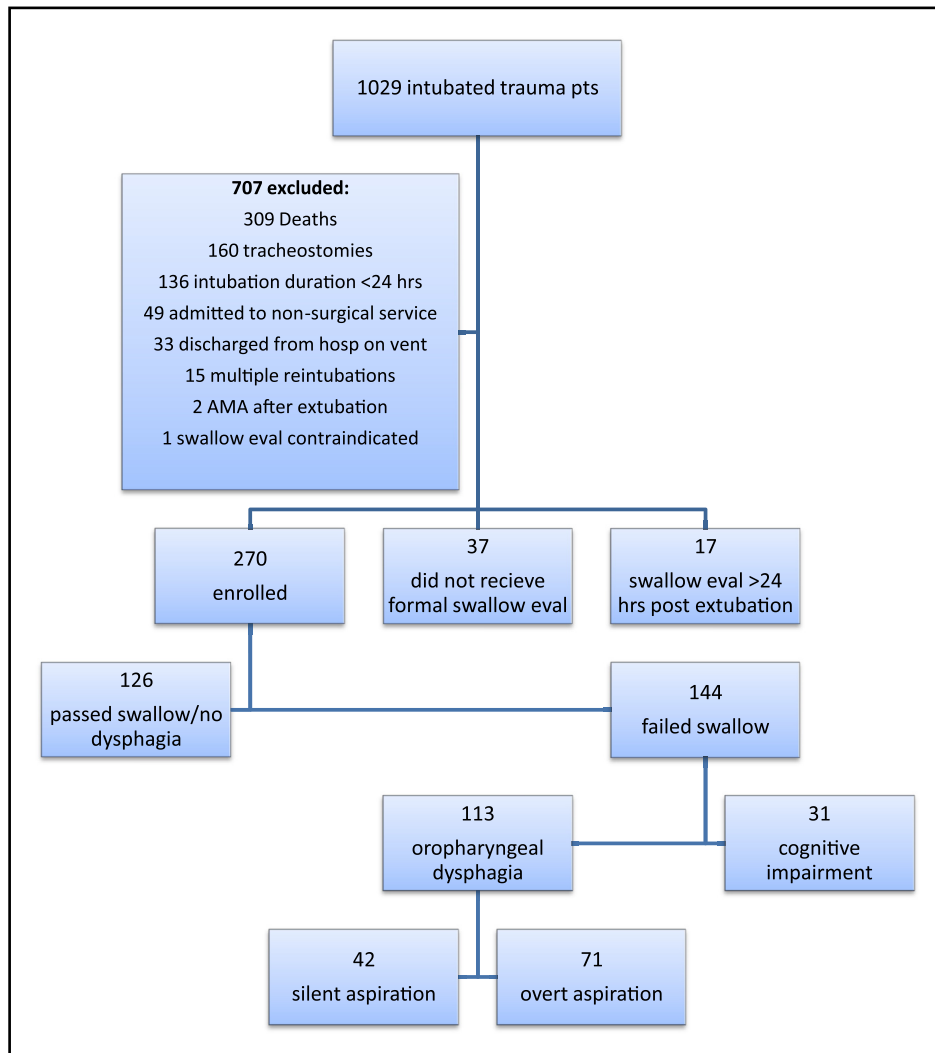


Figure 1 Flow diagram of patient inclusion. AMA = against medical advice.

center, from January 1, 2011, to December 31, 2012. Adult trauma patients who were endotracheally intubated, were subsequently extubated, and had bedside CSE performed by a speech language pathologist within 24 hours after extubation were included. Patients were excluded if they were extubated within 24 hours of intubation, died before extubation, underwent tracheostomy, had multiple repeat intubations, or did not have swallow evaluations done within 24 hours of extubation.

The CSE included an oral peripheral exam, assessment of laryngeal function, upper airway assessment, and trials of different consistencies, starting with the thickest consistency and progressing to thin liquids. Failure was defined as coughing when drinking, laryngeal or pharyngeal residue, inability to clear the oropharynx, or multiple reswallows. Silent aspiration was suspected when airway wetness was heard when talking or by auscultation of the larynx, or delayed cough after swallowing was seen on exam. Reasons for swallow evaluation failure were further differentiated into cognitive impairment, defined as somnolence or sedation and/or decreased mental ability to coordinate swallowing,

and oropharyngeal dysphagia (OD), a mechanical inability to swallow.

Patient variables included age, gender, Glasgow Coma Scale (GCS) score on arrival, Abbreviated Injury Score (AIS) by region, Injury Severity Score, endotracheal tube size, total ventilator days, and development of aspiration pneumonia after extubation. This study was approved by the institutional review board of UCSF Fresno.

Statistical analysis was performed using chi-square analysis and the Mann-Whitney *U* test for independent samples. Logistic regression analysis was used to adjust for confounding variables and to determine odds ratios. Significance was attributed to a *P* value < .05.

Results

During the 2-year study period, 1,029 trauma patients required endotracheal intubation. Of these patients, 136 patients were extubated within 24 hours of intubation, 309 died, 160 underwent tracheostomy, 49 were admitted to a

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