

## Predictive Factors for Aspiration Pneumonia in Videofluoroscopic Swallowing Studies

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### Introduction

Aspiration pneumonia is a major cause of morbidity and mortality in acutely hospitalized patients. Aspiration pneumonia is considered a multifactorial problem, and risk is higher in patients with dysphagia. Although a videofluoroscopic swallowing study (VFSS) is considered the gold standard for evaluation of swallowing function, studies on the correlation between aspiration pneumonia and VFSS parameters are not well established. We aimed to identify significant risk factors associated with aspiration pneumonia in patients with suspected dysphagia who were evaluated with VFSS.

### Methods

A total of 747 patients who underwent VFSS between September 2014 and September 2017 were enrolled. Patients were divided into groups with and without aspiration pneumonia. Clinical information and VFSS findings were reviewed.

### Results

The mean age of the enrolled patients was 70.98±13.57 years, with 394 men and 353 women. Of these, 84 were diagnosed with aspiration pneumonia. There were no group differences according to underlying neurological conditions. Patients with pneumonia were significantly older than those without pneumonia ( $p=0.03$ ). There are significantly larger proportion of male subjects in aspiration pneumonia group ( $p = 0.04$ ). Within the parameters of initial VFSS, positive aspiration findings with a 1-cc or 2-cc trial irrespective of consistency showed significant differences between the two groups ( $p<0.001$ ,  $p=0.013$  respectively), while the findings of aspiration with 5 cc, penetration, or remnant of bolus showed no significant differences. Multiple logistic regression analysis showed that the finding of aspiration with a 1-cc trial in VFSS was the best predictor of aspiration pneumonia (odds ratio=4.96; 95% confidence interval, 1.98–12.43;  $p=0.001$ ).

### Conclusion

The finding of aspiration with a small bolus in VFSS is the best predictor of aspiration pneumonia, while other parameters failed to reveal a significant effect. The Results highlight the importance of detecting small amounts of aspiration on routine VFSS.