Conduction Velocity of Swallowing Pressures in the Pharynx

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INTRODUCTION

During normal swallowing, the longitudinal sequential increase of pharyngeal pressure occurs from the velopharynx to the esophagus for the transportation of a bolus. In this study, we defined this phenomenon as conduction of swallowing pressures, and analyzed the conduction velocity (CV) of swallowing pressures in the pharynx using a high-resolution manometry (HRM) system. There is no evaluation of the CV of swallowing pressures in the pharynx using a HRM system.

METHODS AND MATERIALS

Objectives

The object of the present study was to evaluate the conduction velocity of swallowing pressures in the pharynx.

Study subjects

Study subjects were 95 asymptomatic Japanese volunteers (74 males, age 22-41). A total of 69 pressure sensors in the catheter were used to measure the CV of swallowing pressures in the pharynx using a HRM system.

Study equipment

The CV of swallowing pressure was the fastest at the velopharynx and the slowest at the mesopharynx. The duration of swallowing pressure was the longest at the upper esophageal sphincter (UES) and was the shortest at the mesopharynx. There was a statistically significant difference in all of the values of CV (P<0.05).

RESULTS

CV1 was 24.7 mmHg/mm/s, CV2 was 14.5 mmHg/mm/s, CV3 was 15.0 mmHg/mm/s, and CV4 was 4.7 mmHg/mm/s. There was no significant difference in CV2 and CV3 statistically (P=0.4899). The others were significantly different from each other (P<0.0001).

CONCLUSIONS

The CV of swallowing pressure was the fastest at the velopharynx and the slowest at the mesopharynx. The duration of swallowing pressure was the longest at the UES and was the shortest at the mesopharynx. These findings indicate the conduction pattern of swallowing pressures. For example, the CV from the UES to the pharynx is generated immediately after the bolus move from the mouth to the pharynx via the UES, and continues to prevent backflow to the nasal cavity while the bolus of food passes from the mouth to the pharynx via the pharynx.

REFERENCES