Influence of Head Rotation on Upper Esophageal Sphincter Pressure Evaluated by High Resolution Manometry System

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DISCUSSION
Statistically lower in HOS than in NSF, and was statistically lower in HOS than in NSF.

We speculate that head rotation may cause changes in the anatomical relationship between the larynx and the pharynx, which is likely to facilitate swallowing in patients with unilateral neurological or structural damage to the pharynx and larynx. It is possible that the head rotation maneuver is a rehabilitative tool for dysphagic patients.

CONCLUSIONS
The present study provided us with physiological information of the normal UES pressure in head rotation, which will be an aid to the future clinical and investigative swallowing studies, as well as evidence of the safety and usefulness of the head rotation maneuver for dysphagic patients.

REFERENCES

METHODS AND MATERIALS
Subjects: 18 healthy Japanese male volunteers (age 23-31 years) without a history of dysphagia, gastrointestinal symptoms, previous upper gastrointestinal tract surgery, or other significant medical condition.

The study protocol was approved by the institutional review board committee of Nagasaki University Hospital, and written informed consent was obtained from each participant.

Measurement Using High Resolution Manometry
The protocol using the HRM system (Sierra Scientific Instruments Inc., Los Angeles, CA) was described in our previous report in detail 3, 4.

RESULTS
All results measured in the present study are demonstrated in Figures 4, 5 and 6.

The maximum and mean values of the resting UES pressure about the head rotation, which will be an aid to the future clinical and investigative swallowing studies.

In brief, after a local anesthesia in the nasal cavity, the catheter was inserted and fixed by taping at the nostril with the patient in a natural supine position. The side of the manometric sensor in the pyriform sinuses was endoscopically confirmed (Figure 1).

Figure 1. Manometric sensor (232) was placed on the side of the pyriform sinus in this case.

Figure 2. All parameters demonstrated in a selected area (highlighted line), using ManoView® analysis software.

Figure 3. Typical changes of the color-graphic patterns were demonstrated. "A" and "B" showed typical patterns. Repeated measures ANOVA revealed that the head rotation maneuver had a statistically significant effect (df=17; t=4.960 and t=5.615, and p=0.0001 and p<0.0001, respectively), and were statistically lower in HOS than in NSF (df=17; t=7.781, and p<0.0001). The RUESPL was statistically shorter in HOS than in NSF (df=17; t=8.798, and p<0.0001), but there was no significant difference in RUESPL between HSS and NSF (df=17; t=1.063, and p=0.3024).

Figure 4. Results of the maximum value of the resting UES pressure in HSS, NSF, and HOS.

Figure 5. Results of the mean value of the resting UES pressure in HSS, NSF, and HOS.

Figure 6. Results of the length of the resting UES pressure in HSS, NSF, and HOS.