Age-related changes of deglutitive pharyngeal clearance evaluated by quantitative measurement
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ABSTRACT
To know swallowing ability, one of the most important subjects is to evaluate pharyngeal clearance of swallowing. Until today age-related change of it has not yet been known well. We evaluated in every age group using our newly developed quantitative measuring method in the videofluoroscopic (VF) swallowing study.

RESULTS
The subjects were 65 healthy adults (31 male and 34 female) without dysphagia. All subjects were instructed to swallow 10ml of 100% barium and the pharyngeal clearance was measured in % with our PC-based measuring system.

Evaluation of the pharyngeal clearance in the videofluoroscopic (VF) swallowing study is one of the most serious subjects of clinical swallowing study. Until today, age-related change of it has not yet been known well. We evaluated in every age group using our newly developed quantitative measuring method.

METHODS
ABSTRACT
RESULTS 1
To know swallowing ability, one of the most important subjects is to evaluate pharyngeal clearance of swallowing. Until today age-related change of it has not yet been known well. We evaluated in every age group using our newly developed quantitative measuring method in the videofluoroscopic (VF) swallowing study.

METHODS continued

METHODS AND MATERIALS
Measuring method
Images of VF using 100% (weight per volume) barium as a contrast medium were captured by our PC system in AVI format and transformed to bit map images of 30 frames per second. Three images of a reference image, full medium image and residual medium images were selected and prepared for extracting not contrast medium image from digitally subtracting a reference image from full medium and residual medium images. Volume of contrast media can be estimated by converting brightness index shows inverse proportion with the thickness of contrast medium, and saturated within 10mm thick medium.

CONCLUSIONS
Although the elders above 85 years old demonstrate the tendency of decreasing pharyngeal clearance of swallowing in accordance with their age, the degree of it in the elders is well maintained (almost over 90%), while the mean value is significantly less than in the youngers.

REFERENCES

DISCUSSION
Pharyngeal clearance (%) could be measured in all subjects by this system. The mean pharyngeal clearance of them was 93.5%. We divided an age group into under 60 years old (younger group) and 60 years or older (elder group), and we compared the clearance between these two groups. The pharyngeal clearance in the younger group was over 90% (mean = 94.1%, SD = 0.04), while in the elder group, however, the pharyngeal function of them should be better maintained than we expected. In the elder, merely aging will not but other pathological factors lead to dysphagic condition.

METHODS
The subjects were 65 healthy adults (31 male and 34 female) without dysphagia, whose age ranged from 14 to 88 years old. All subjects were instructed to swallow 10ml of 100% barium and the clearance was measured in %. Images of VF were captured, and volumes of contrast medium were estimated by calculating thickness as a function of brightness.

RESULTS 2
Pharyngeal clearance (%) could be measured in all subjects by this system. The mean pharyngeal clearance of them was 93.5%. We divided an age group into under 60 years old (younger group) and 60 years or older (elder group), and we compared the clearance between these two groups. The pharyngeal clearance in the younger group was over 90% (mean = 94.1%, SD = 0.04), while in the elder group, however, the pharyngeal function of them should be better maintained than we expected. The clearance in the elder group, however, the pharyngeal function of them should be better maintained than we expected. In the elder, merely aging will not but other pathological factors lead to dysphagic condition.

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