

VOCAL FOLD TISSUE OF A 104-YEAR-OLD LADY

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Introduction

The elongation of the average span of human life has brought us an increase of geriatric voice problems. For the evaluation and treatment of geriatric voice problems, it is important to have a thorough understanding of geriatric changes of anatomy and physiology of the vocal mechanism. A world-wide data basis for geriatric vocal fold anatomy is desired. We have had an opportunity to study the vocal fold tissue of a 104-year-old Japanese lady. The purpose of this study is to congratulate Professor Masayuki Sawashima on his sixtieth birthday by presenting histological findings of the vocal fold of a 104-year-old lady.

Material and Method

The larynx of a 104-year-old Japanese lady was contributed by courtesy of Dr. Hiroyuki Shimada, Tokyo Metropolitan Institute of Gerontology. She was a non-smoker and died of cerebral infarct. Autopsy revealed she had bronchiectasia and heart fibrosis. No pathology was observed in the larynx and neighboring structures. The larynx was divided at the mid saggital plane. The right half was sectioned horizontally whereas frontal sections were prepared from the left half for a histological study. The Hematoxylin-Eosin, Azan, Weigert and Elastica van-Gieson stains were employed.

Results

The length of the membranous vocal fold, cartilaginous vocal fold and lateral wall of the posterior glottis was 8.8 mm, 1.8 mm and 5.6 mm respectively. The terminology for these structures is based on Hirano's definition. The anteroposterior dimension of the glottis was 16.3 mm.

Figure 1 shows a horizontal section of the right vocal fold and Figure 2 depicts frontal sections of the left vocal

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fold at five locations. The thickness of the mucosa and the muscle at the five locations is shown in Table 1. The thickness of the mucosa was greatest at the both ends (A and E) and smallest at the middle (C) whereas the thickness of the muscle increased as the posterior end is approached. This is a general rule for normal vocal folds. 2)

The epithelium was squamous cell epithelium at the edge of the membranous vocal fold and it was ciliated epithelium at the other structures including the posterior glottis, laryngeal ventricle, false fold and subglottis. No hyperplasia, dysplasia, metaplasia and hyperkeratosis were observed.

At the vocal fold edge, the superficial layer of the lamina propria was poor in collagenous and elastic fibers. Some fibers were found sparcely underneath the basement membrane. Fibroblasts were sparce. No marked edema was noted in this particular individual. In the intermediate layer of the lamina propria, there were dense elastic fibers presenting no atrophy. The normal contour of this layer was well preserved. The deep layer of the lamina propria did not show marked increase in collagenous fiber density and fibrotic pattern.

There was no muscle atrophy. Glands were not atrophic either. The thyroid cartilage was ossified at small posterior and inferior portions.

Comments

Hirano et al 3) investigated histologically the vocal fold tissue of different age groups ranging from 0 to 60's. They reported that, with aging, the superficial layer of the lamina propria tended to become thicker and edematous while the density of fibroblast and fibers decreased, the elastic fibers in the intermediate layer tended to become less dense and atrophied, the collagenous fibers in the deep layer tended to become dense, thickened and fibrotic, and the muscle tended to become atrophied. These tendency was more marked in males than in females and varied greatly from individual to individual.

The vocal fold tissue of the 104-year-old lady investigated in the present study displayed minimum geriatric changes.

We hope Professor Sawashima's vocal fold keeps being as young as the vocal fold presented here.

Summary

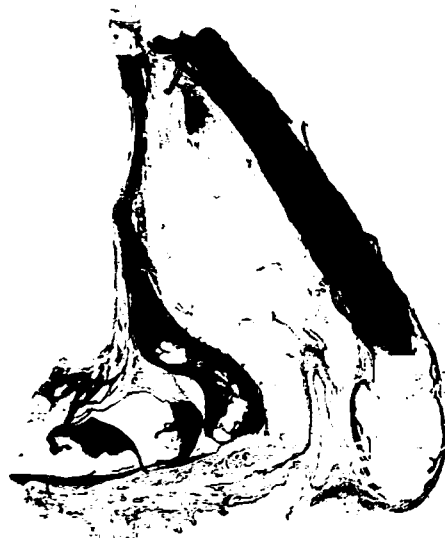


Figure 1. Horizontal section of the right vocal fold.
Elastica van Gieson stain.

Table 1. Thickness of the mucosa and the muscle in mm at five locations.

	Mucosa	Muscle
A	1.95	1.20
B	Not available	
C	0.95	4.15
D	1.10	5.60
E	1.80	5.80

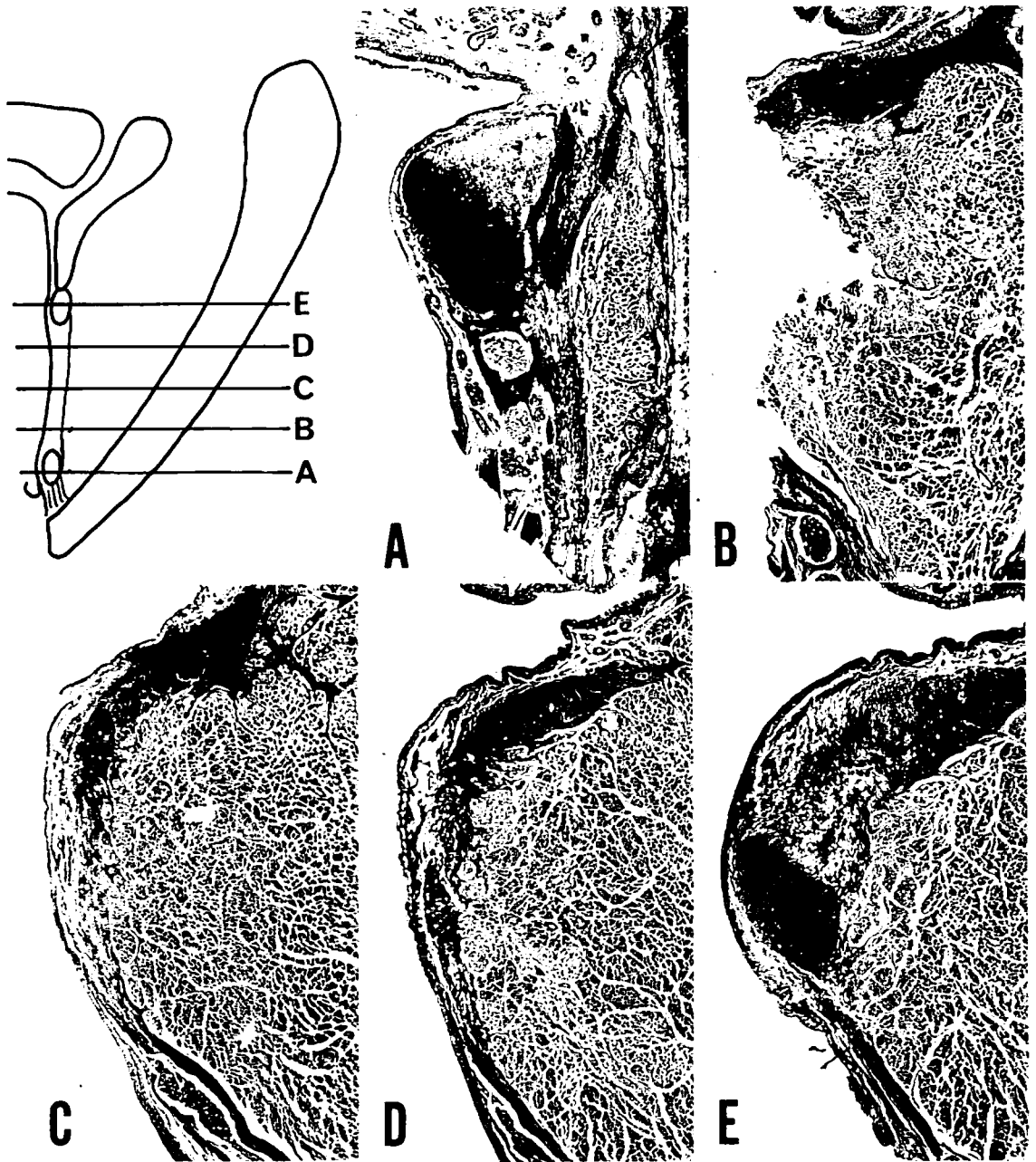


Figure 2. Frontal sections of the left vocal fold at five locations. A: At the anterior macula flava, B: At the midpoint between A and C, C: At the middle of the membranous vocal fold, D: At the midpoint between C and E, E: At the posterior macula flava. The vocal fold edge in B is missing because of an artifact. Elastica van Gieson stain.

Histological findings of the vocal fold of a 104-year-old lady were presented. Geriatric changes in this particular individual were minimum.

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