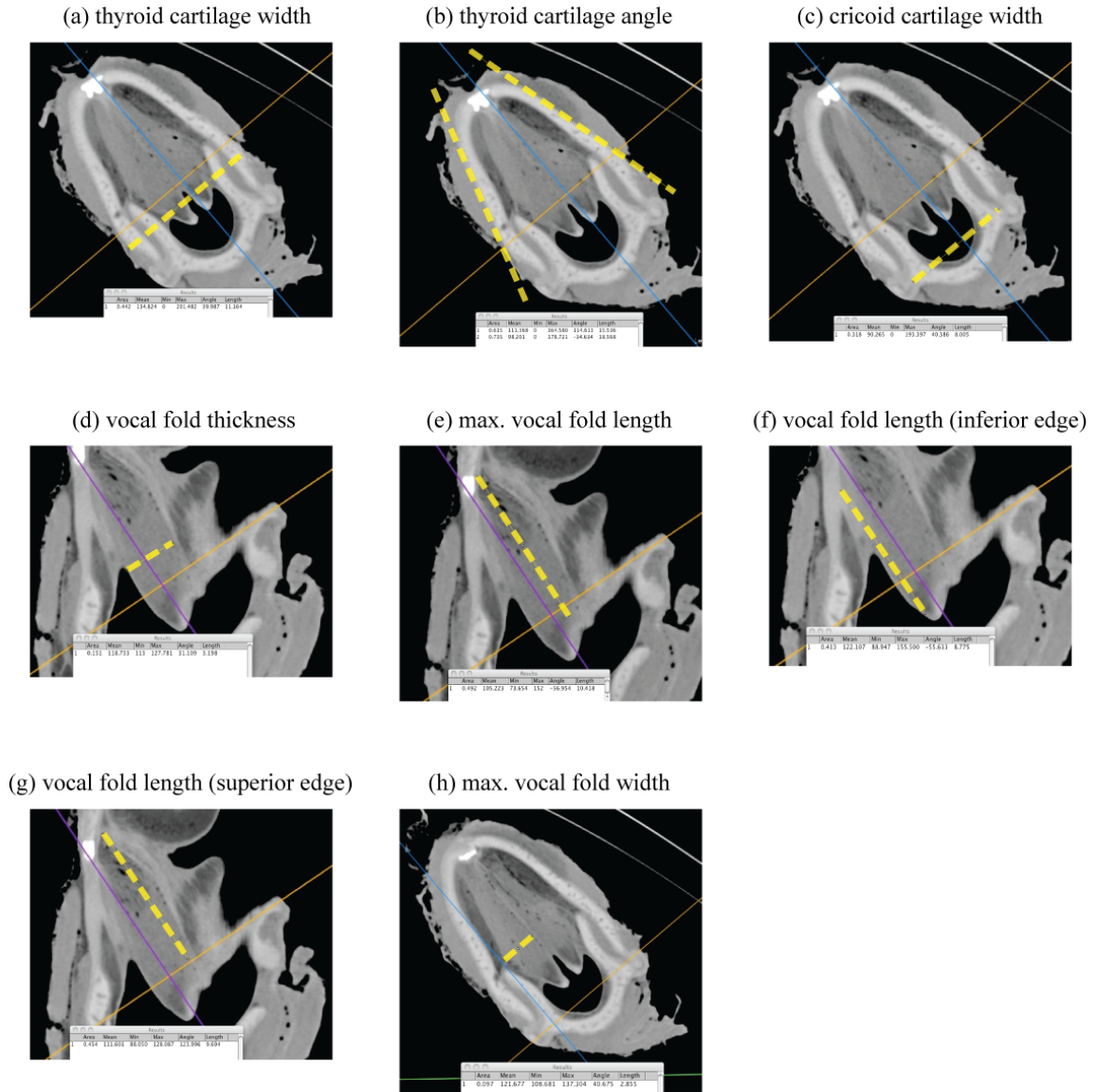
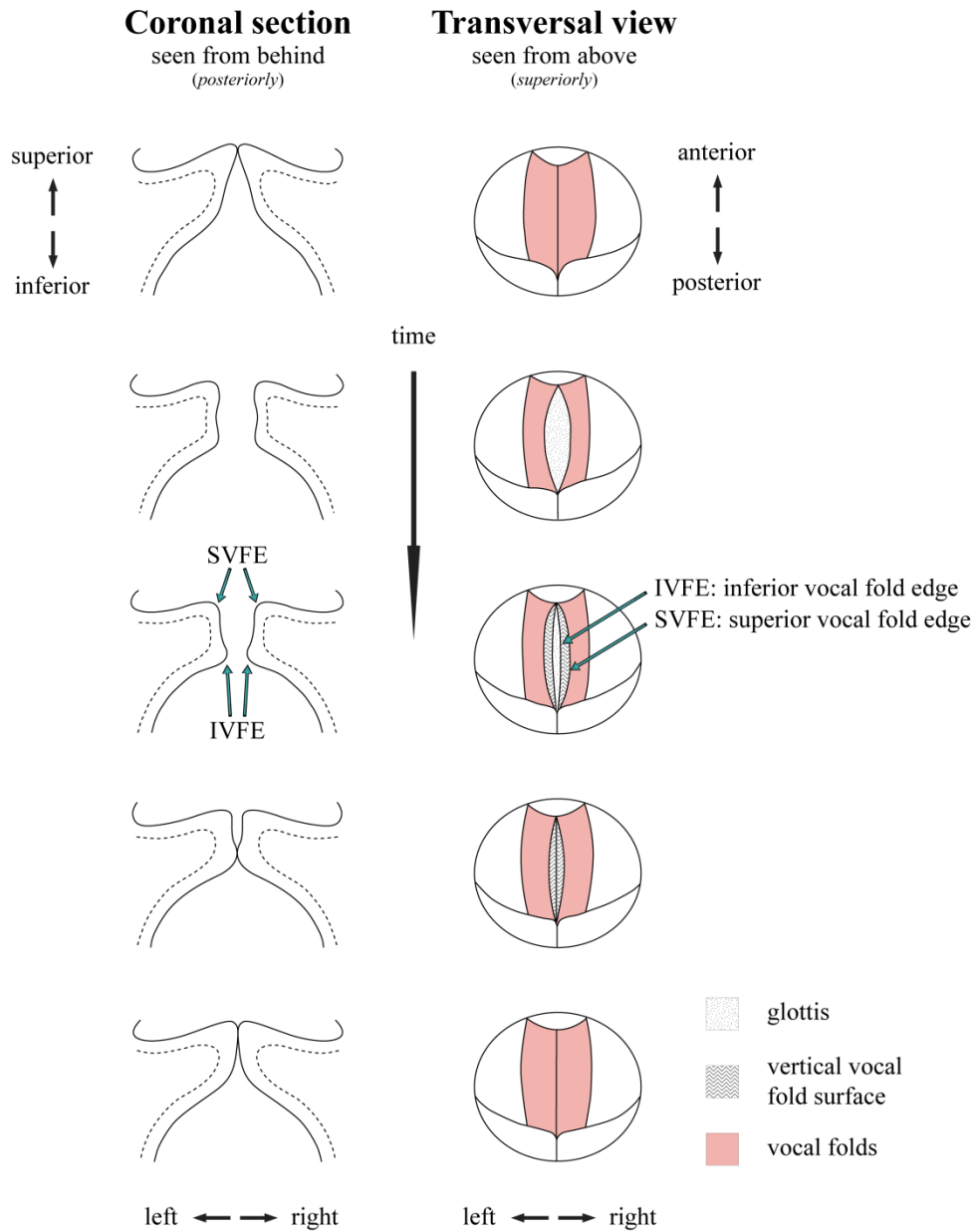


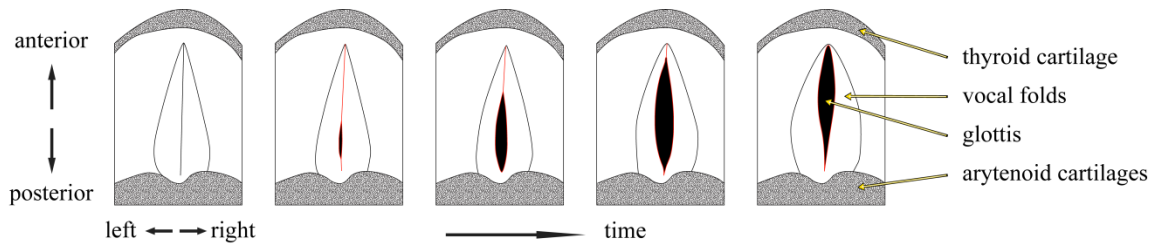
# Supplementary Material



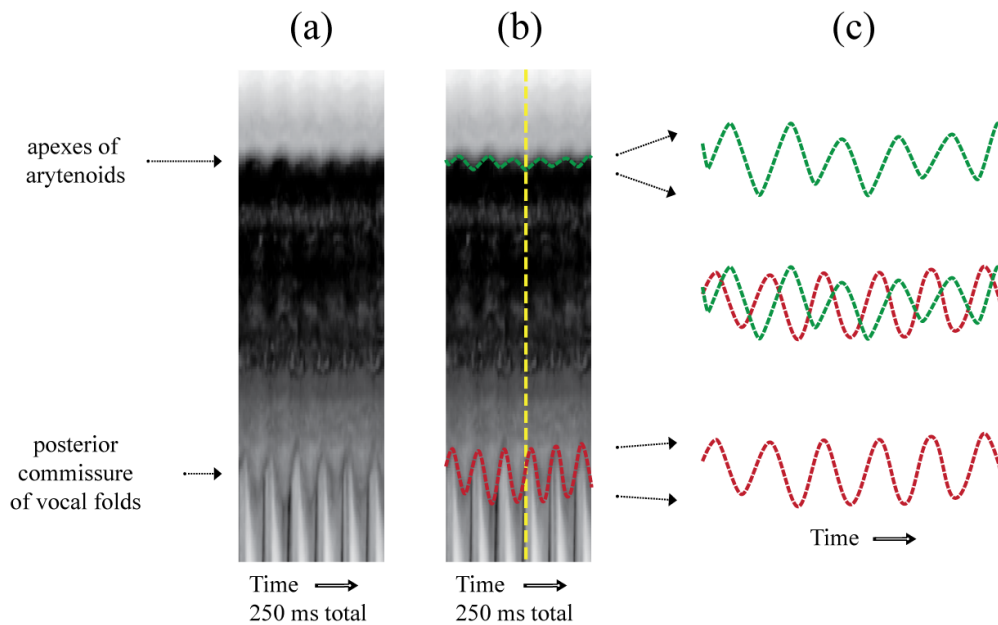
**Supplementary figure 1: Sections through 3D volume renderings of CT data, used for making the anatomical measurements shown in Table 1.**



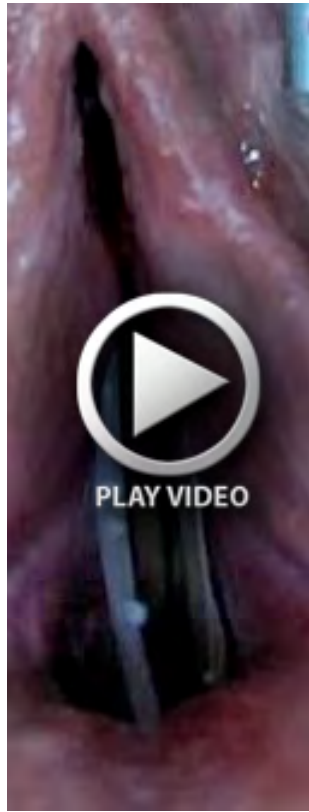
**Supplementary figure 2: Schematic illustration of vertical phase differences during vocal fold vibration (based on Hirano, 1981, Fig. 4.1). The lower (inferior) vocal fold edge “leads” the vibration in relation to the upper (superior) vocal fold edge. As a consequence, both the inferior and the superior vocal fold edges are visible in that phase of the vibratory cycle where the inferior edges of the vocal folds are moving medially while the superior vocal fold edges are still in a lateral position (see transversal view, third row).**



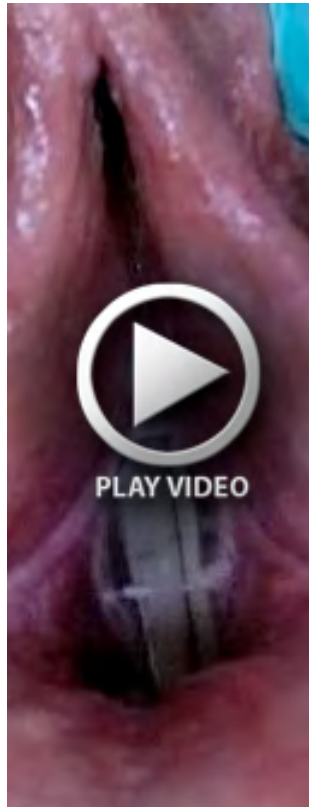
**Supplementary figure 3: Schematic illustration of a “zipper-like” glottal opening, caused by a posterior-anterior phase difference. The initial glottal opening (second frame) does not occur in the middle of the anterior-posterior glottal axis, but more towards the back (posteriorly). The initial opening is then propagated forward (anteriorly) in frames 3 – 5.**



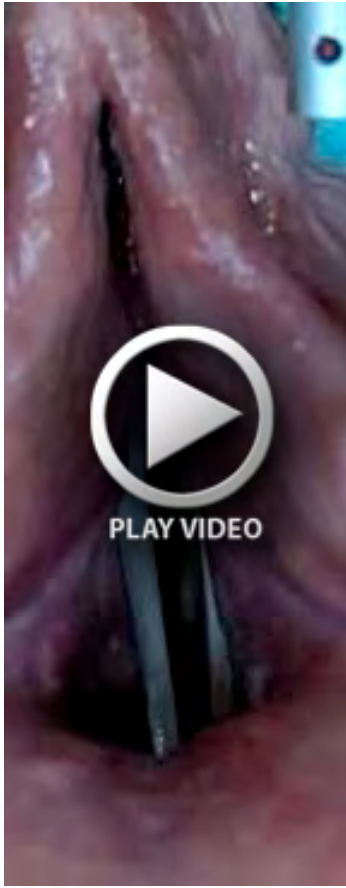
**Supplementary figure 4: Illustration of vibratory phase differences in laryngeal structures. (a) enlarged DKG, taken from Fig. 6C, zoomed to show only the posterior part of larynx; (b) vibration of the apices of the arytenoids (top) and posterior commissure of vocal folds (bottom) traced in yellow; (c) Top and bottom: Amplitude-scaled time-synchronous vibratory traces of both structures (apices of arytenoids and posterior commissure of vocal folds). Center: Superimposed normalized vibratory traces of both structures. Note the phase delay of approximately 100 – 110 degrees.**



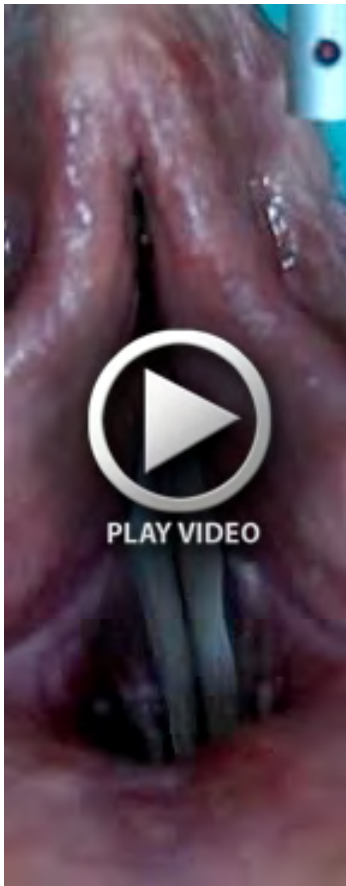
**Movie 1.**



**Movie 2.**



**Movie 3.**



**Movie 4.**



Movie 5.

**Supplementary movie M 1: Periodic Vocal Fold Vibration. High-speed video of flow-induced phonation in excised elephant larynx, recorded with a frame rate of 600 fps (frames per second).**

**Supplementary movie M 2: Synchronized vibration of vestibular and vocal folds. High-speed video of flow-induced phonation in excised elephant larynx, recorded with a frame rate of 600 fps. In order to stay within the journal's limit of 5 MB for supplementary materials, only the final portion of the sequence shown in Fig. 5 is covered by the video sequence.**

**Supplementary movie M 3: Complex "double-zipper" vibratory pattern of vocal folds. High-speed video of flow-induced phonation in excised elephant larynx, recorded with a frame rate of 600 fps.**

**Supplementary movie M 4: Irregular vocal fold vibration. High-speed video of flow-induced phonation in excised elephant larynx, recorded with a frame rate of 600 fps.**

**Supplementary movie M 5: Intermittent episodes of anterior-posterior travelling waves. High-speed video of flow-induced phonation in excised elephant larynx, recorded with a frame rate of 600 fps.**

## **Reference**

**Hirano, M.** (1981). *Clinical Examination of Voice*. New York: Springer-Verlag.