

Anatomy of the Larynx

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2nd London

Phonosurgery Course



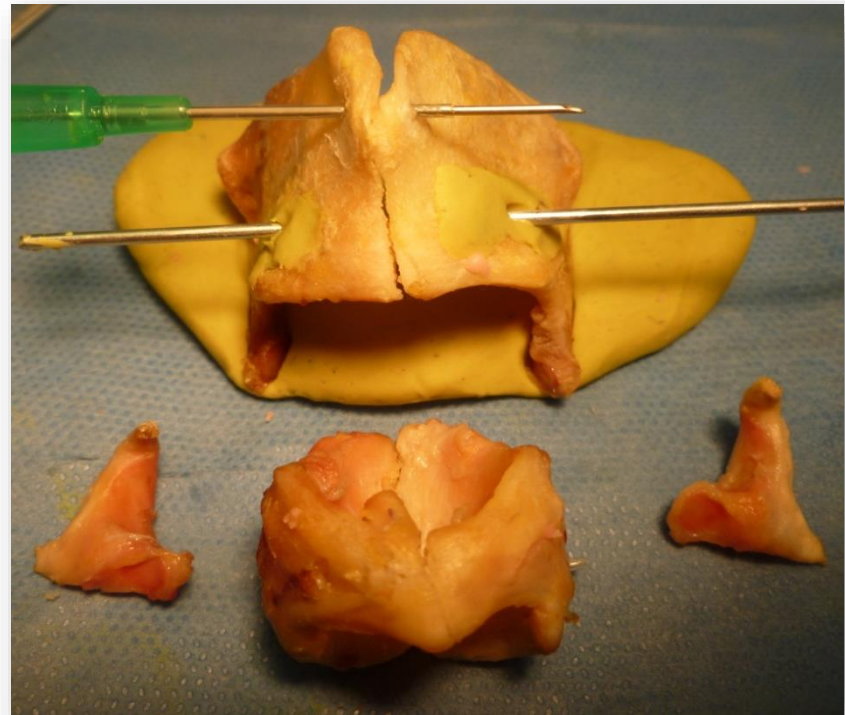
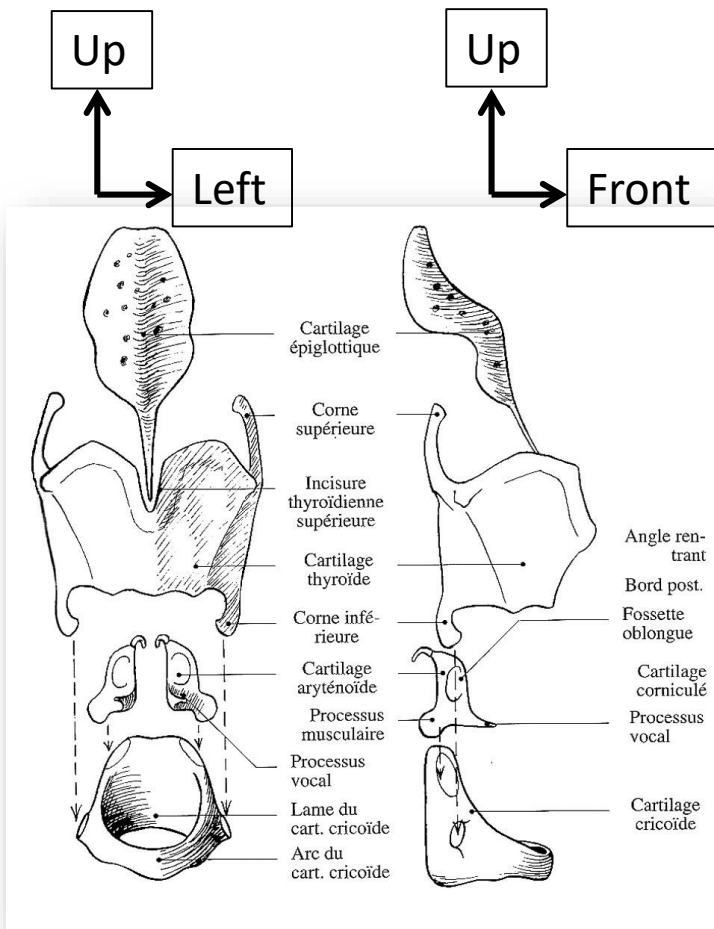
PHONOSURGERY AND NEUROLARYNGOLOGY

Hands-On Dissection Course

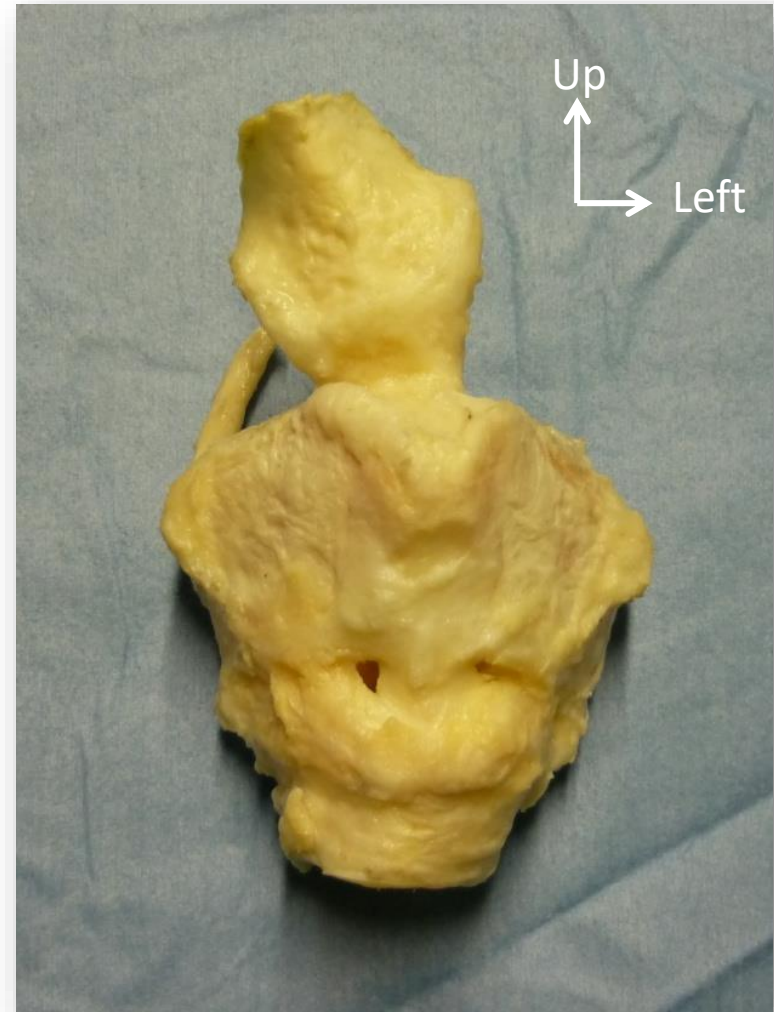
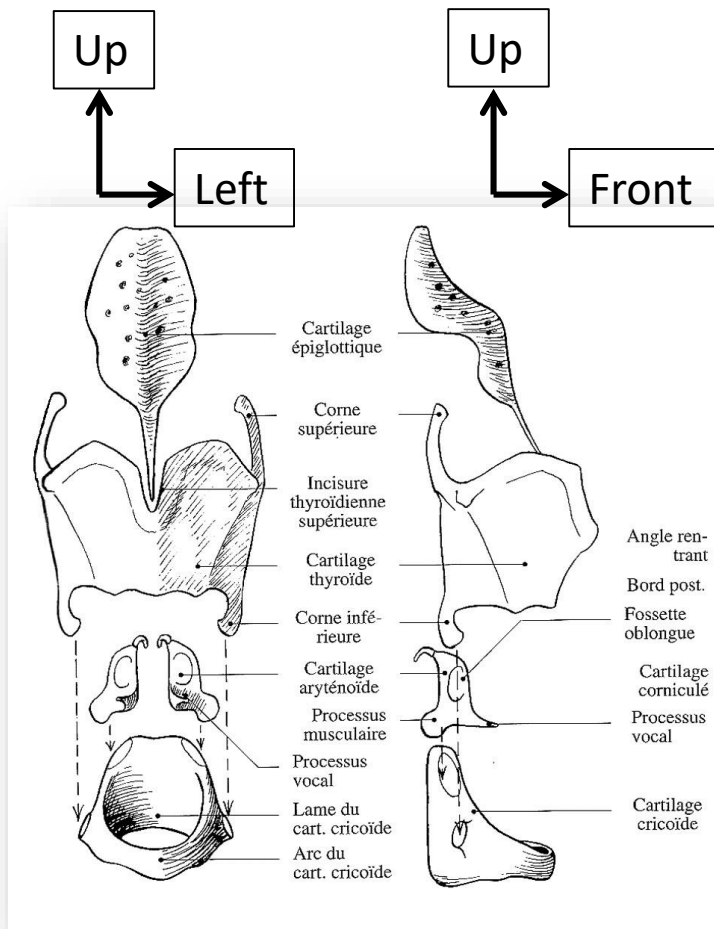
2-3 August 2022



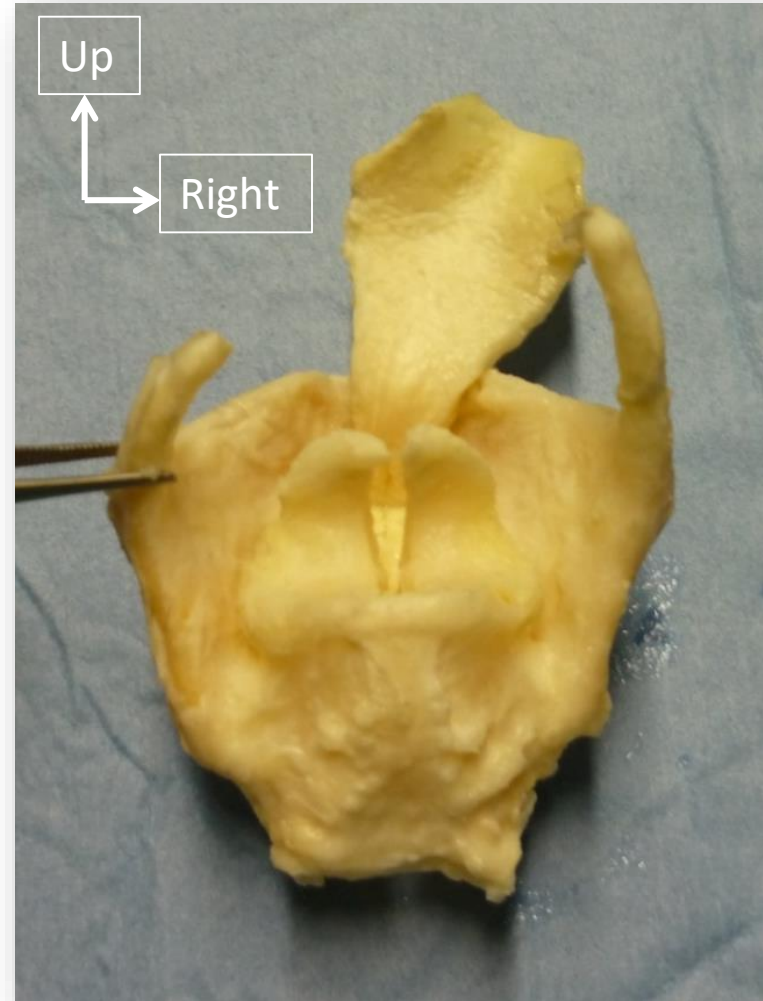
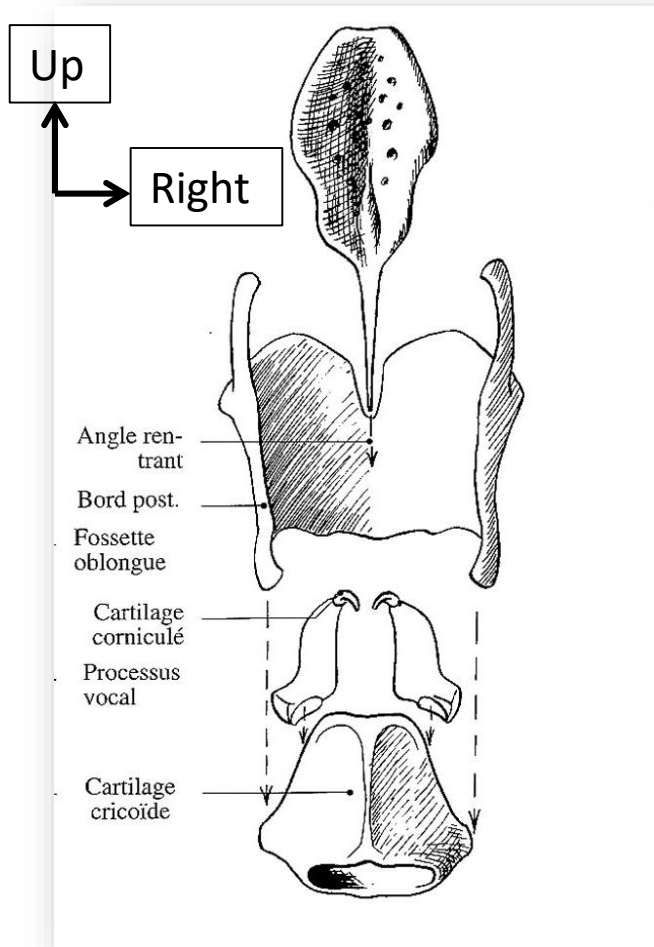
Cartilages and joints of the larynx

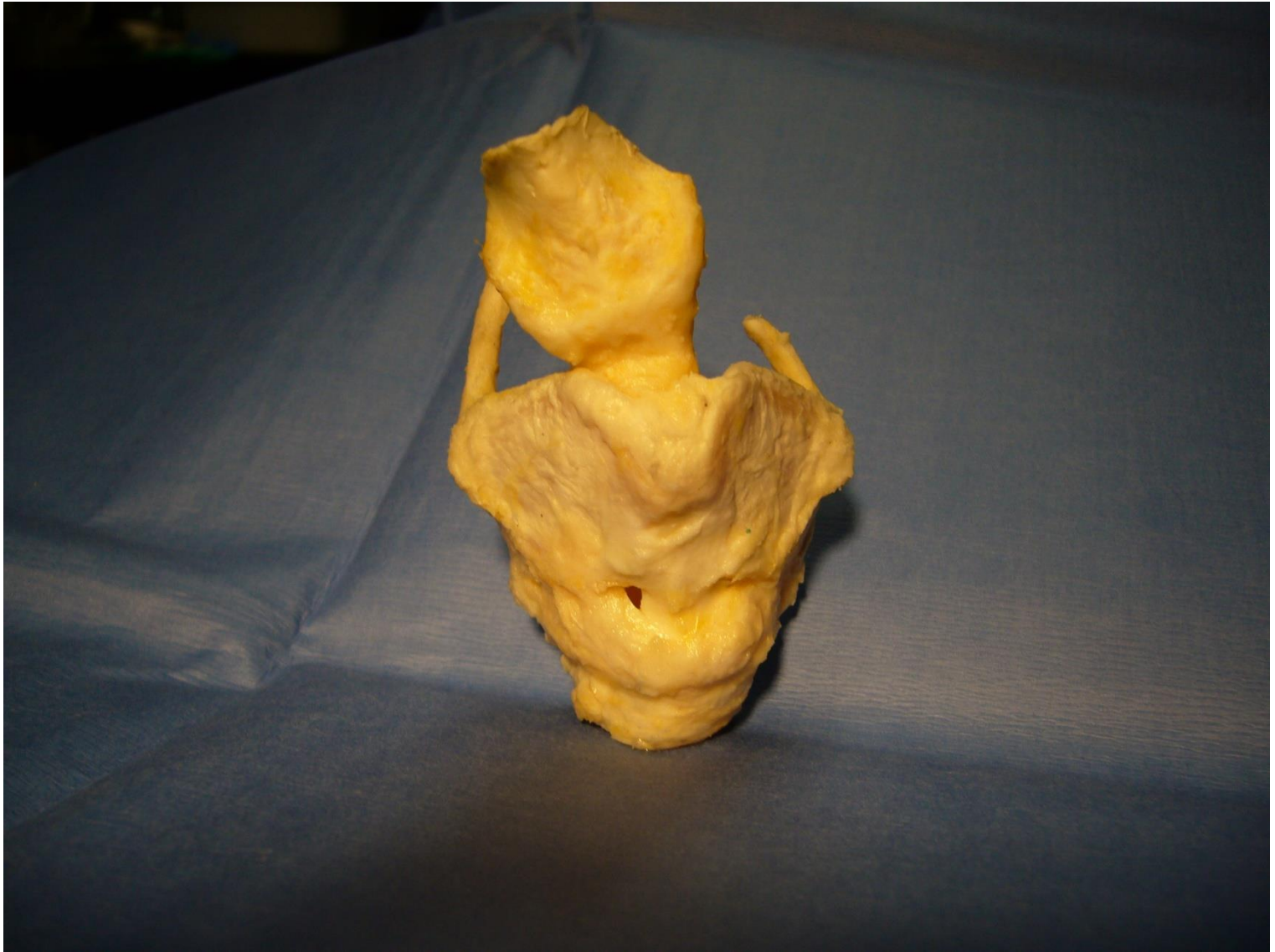


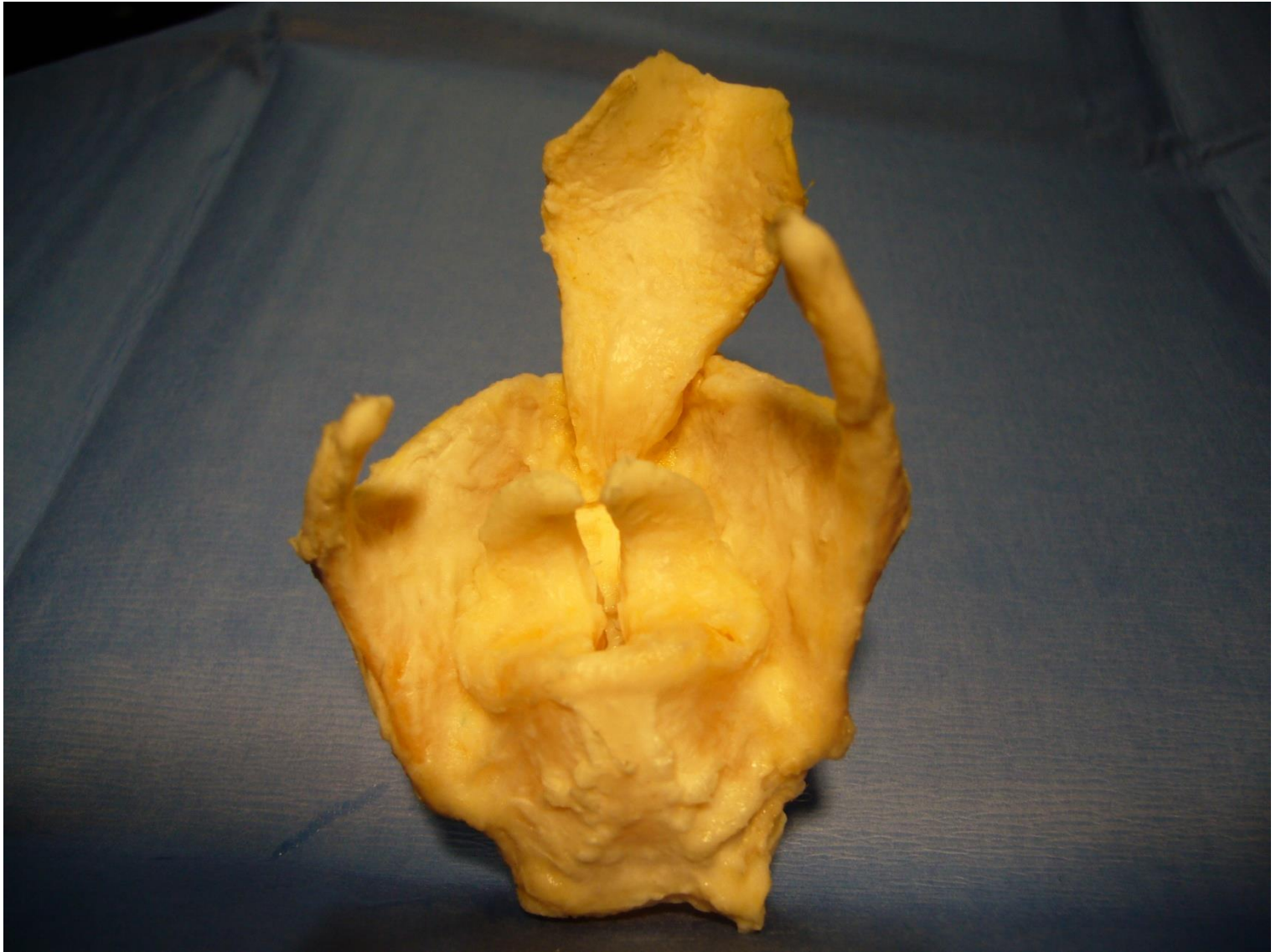
Cartilages and joints of the larynx



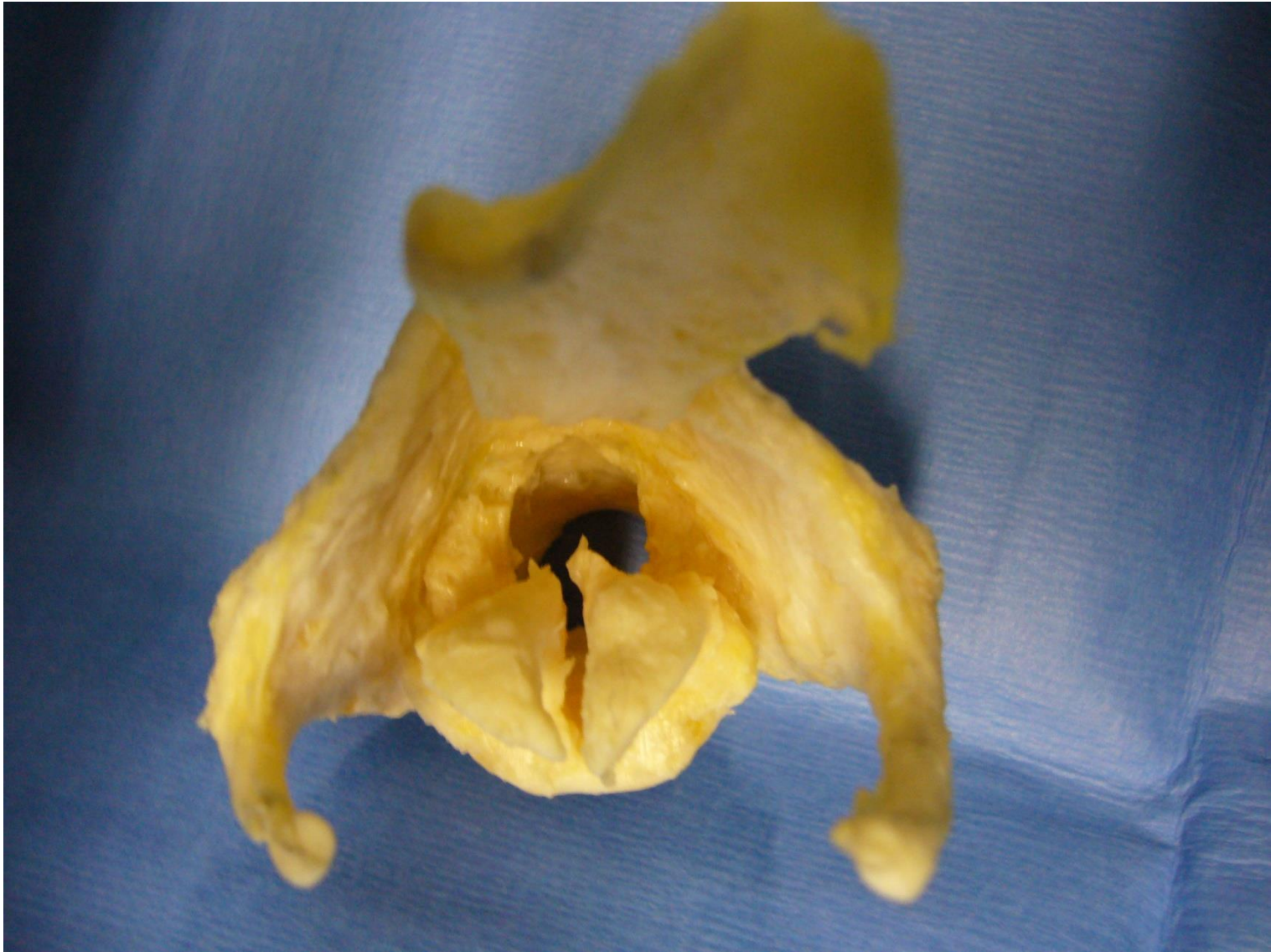
Cartilages and joints of the larynx







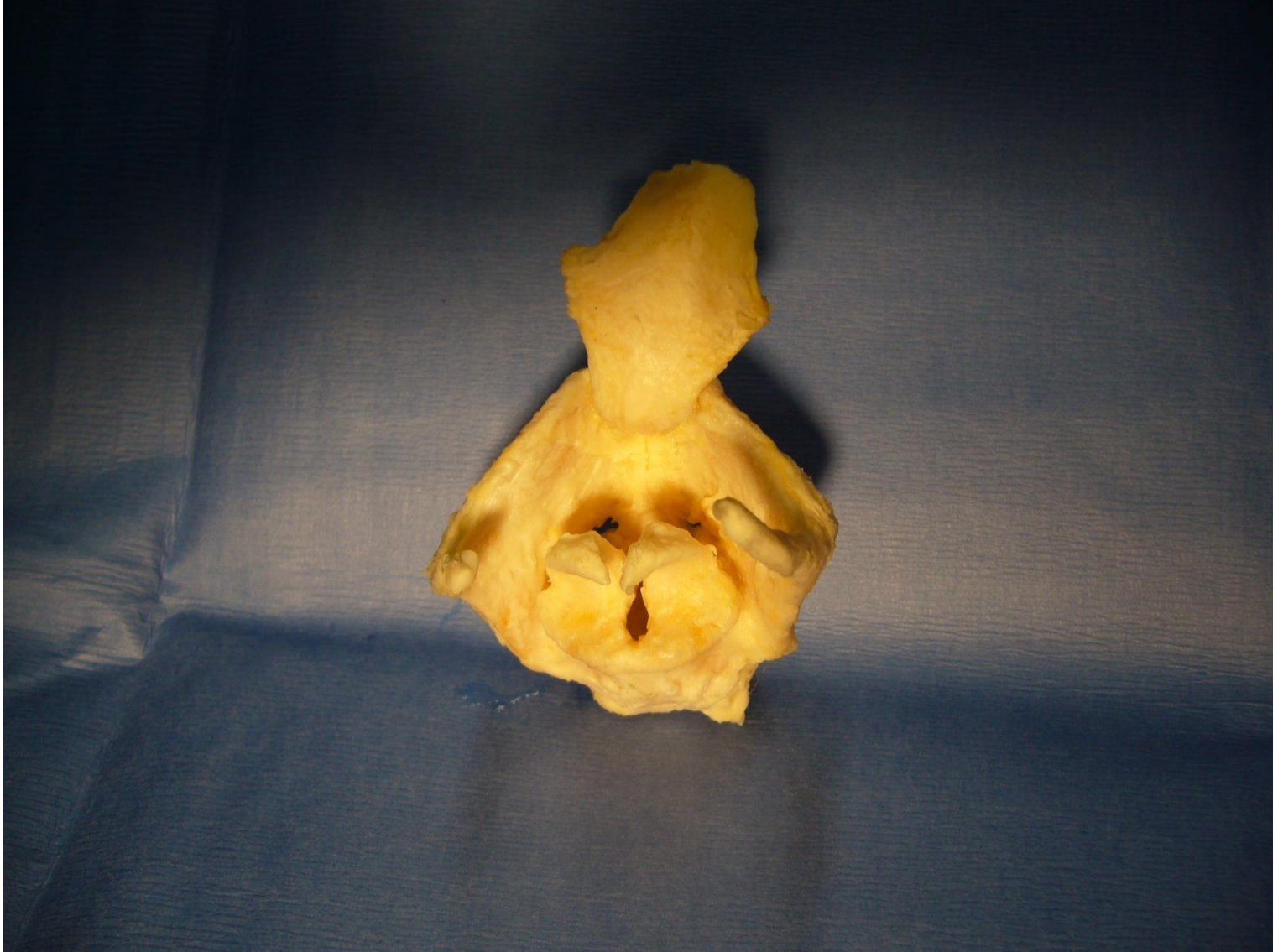


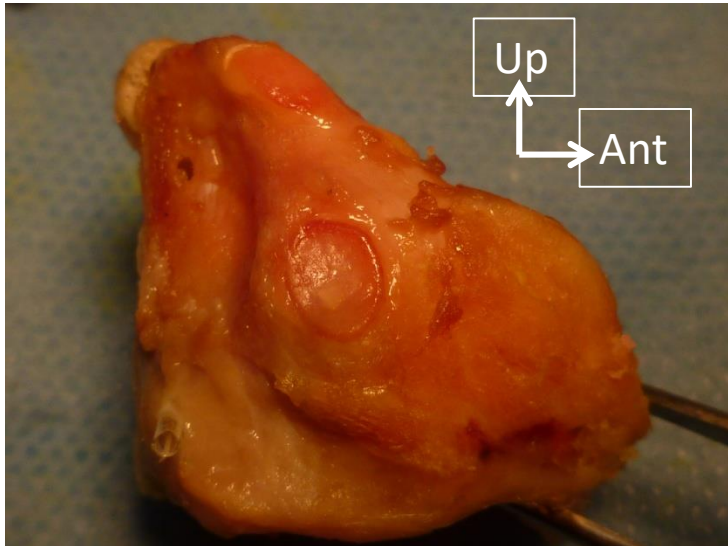
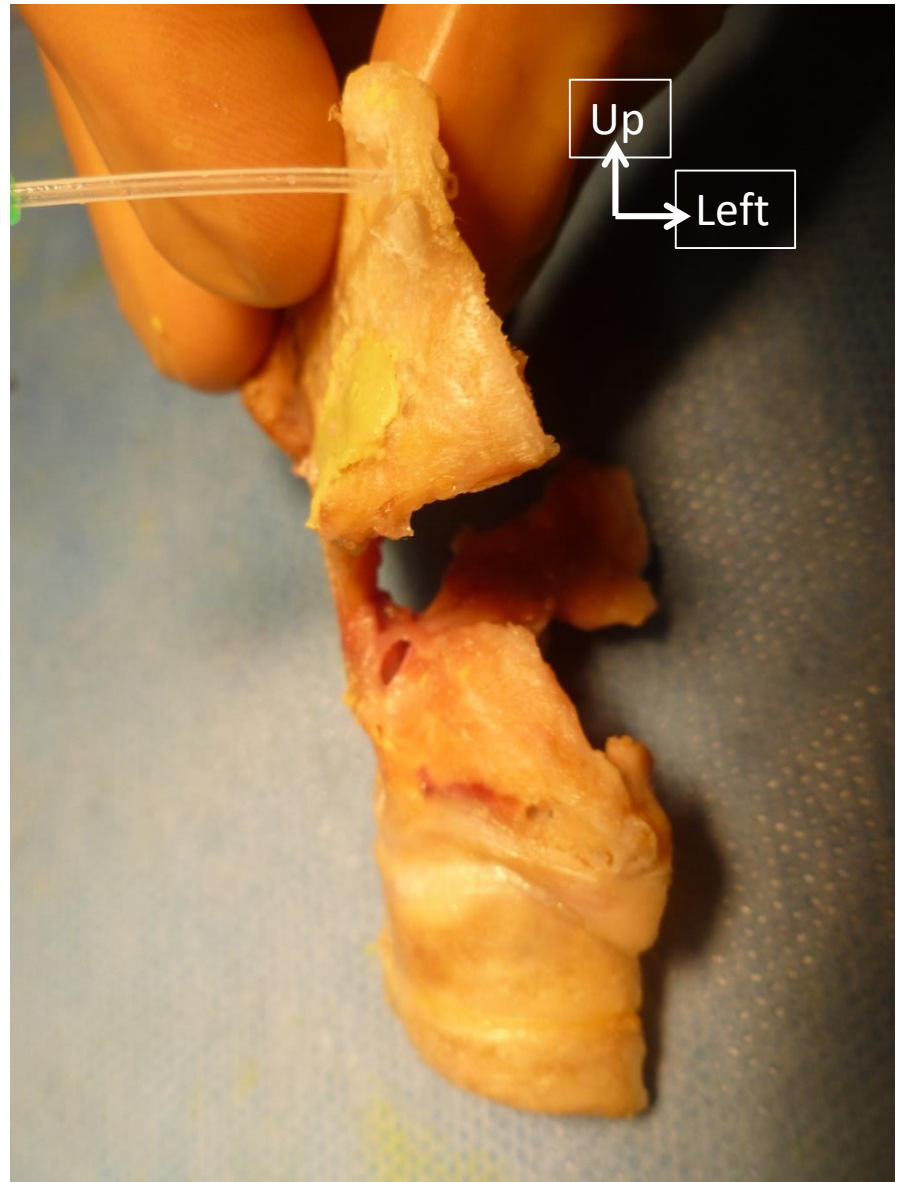
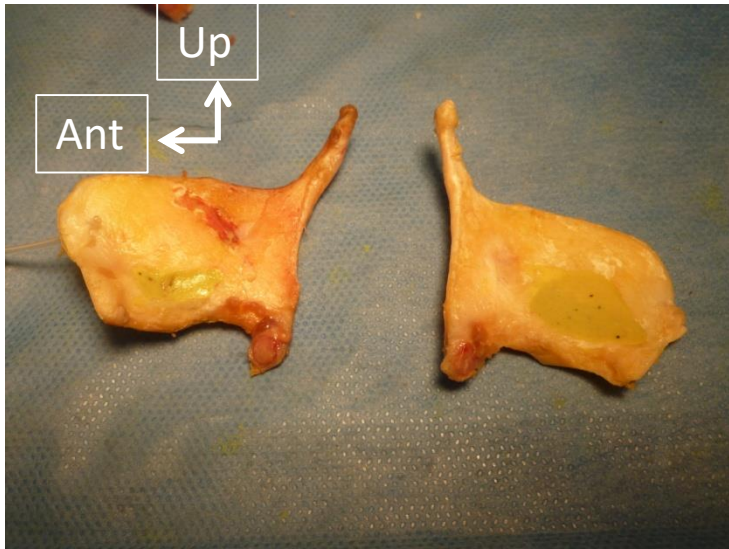




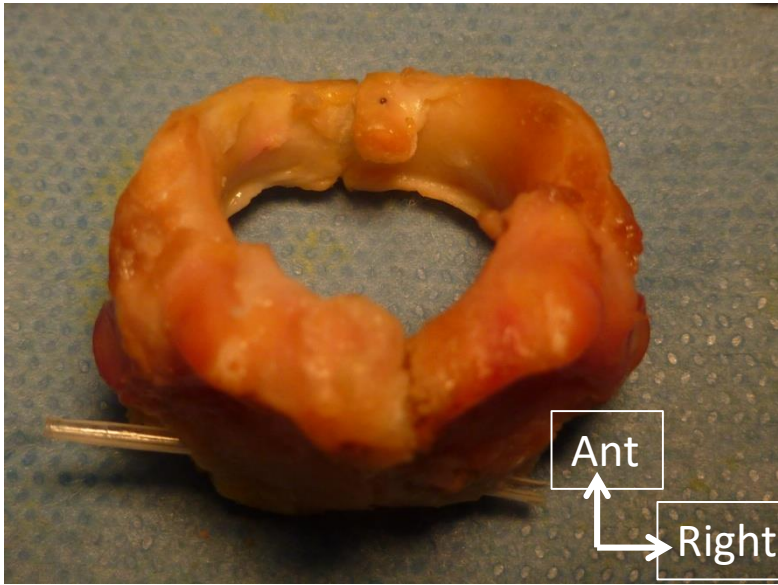




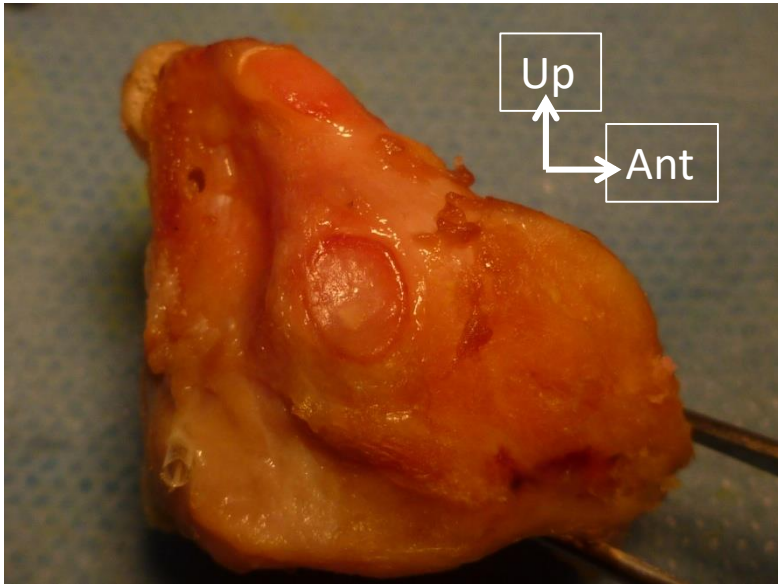
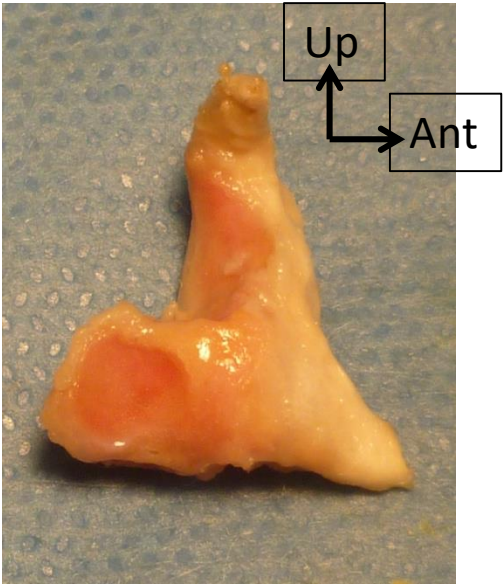




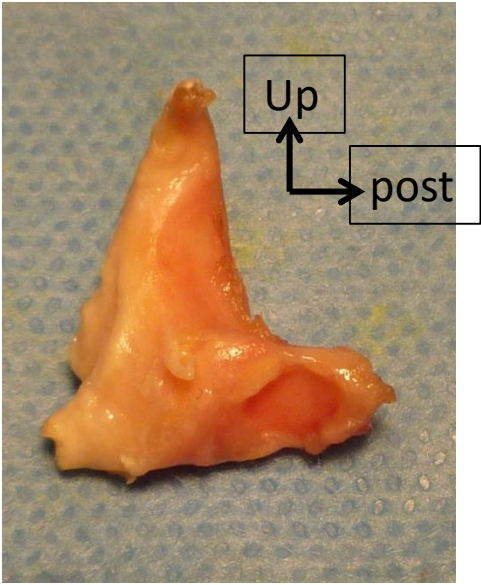




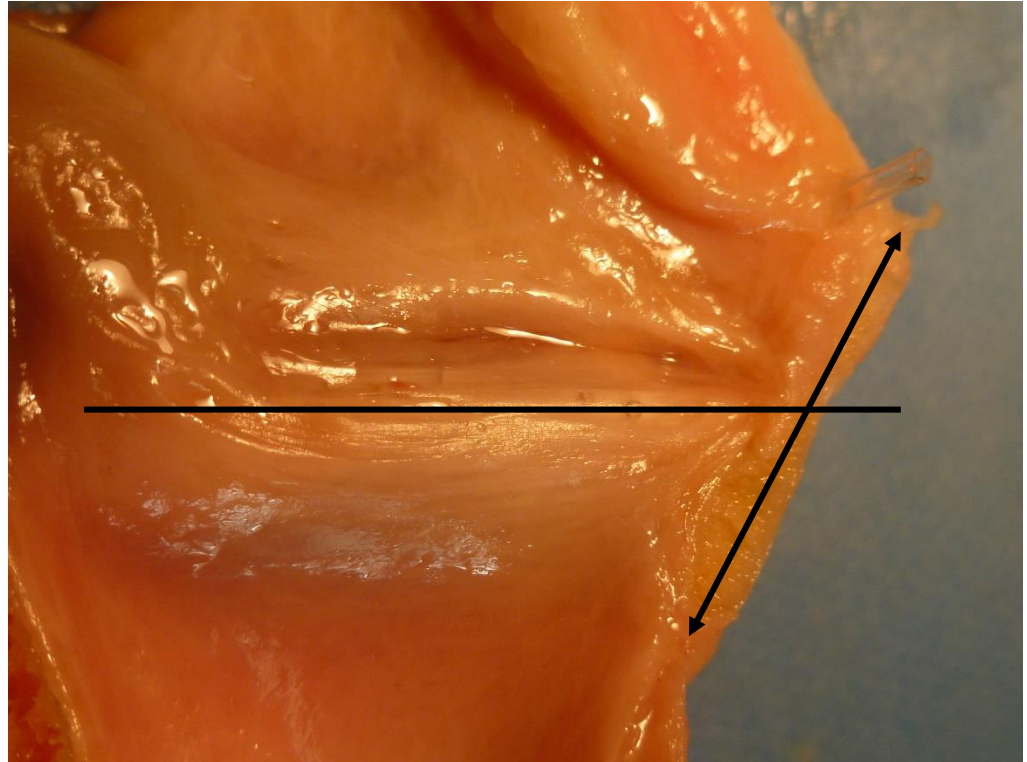
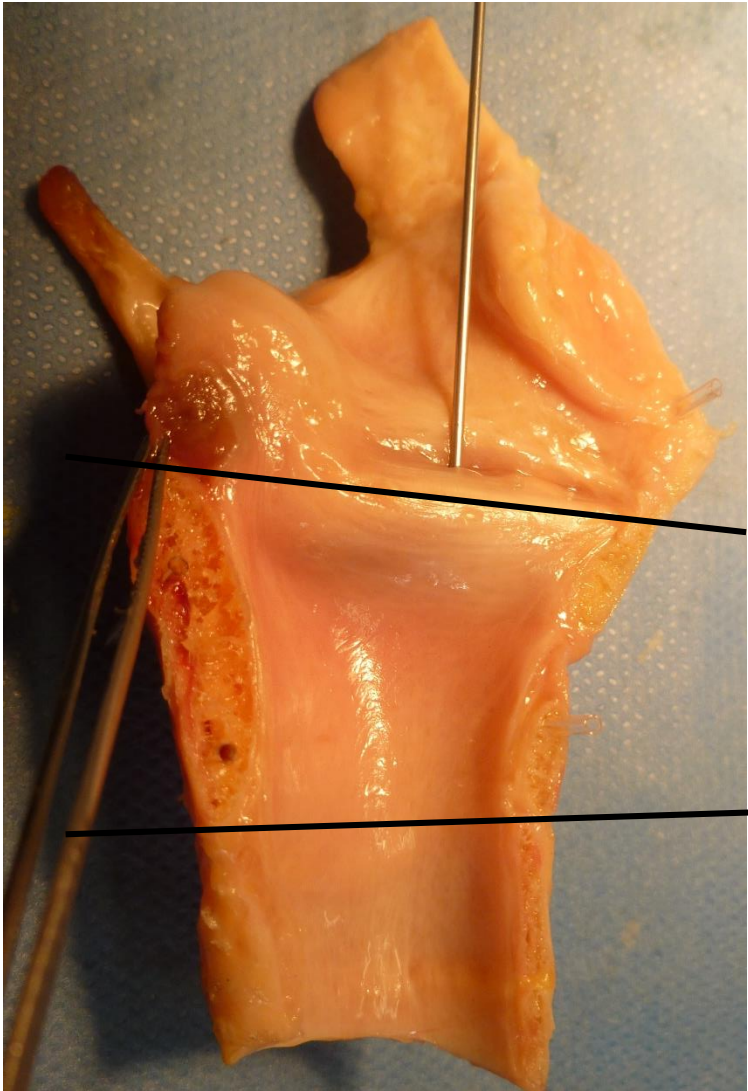
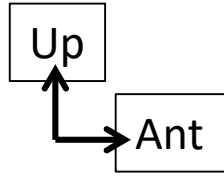
Left Arytenoid



Cricoid



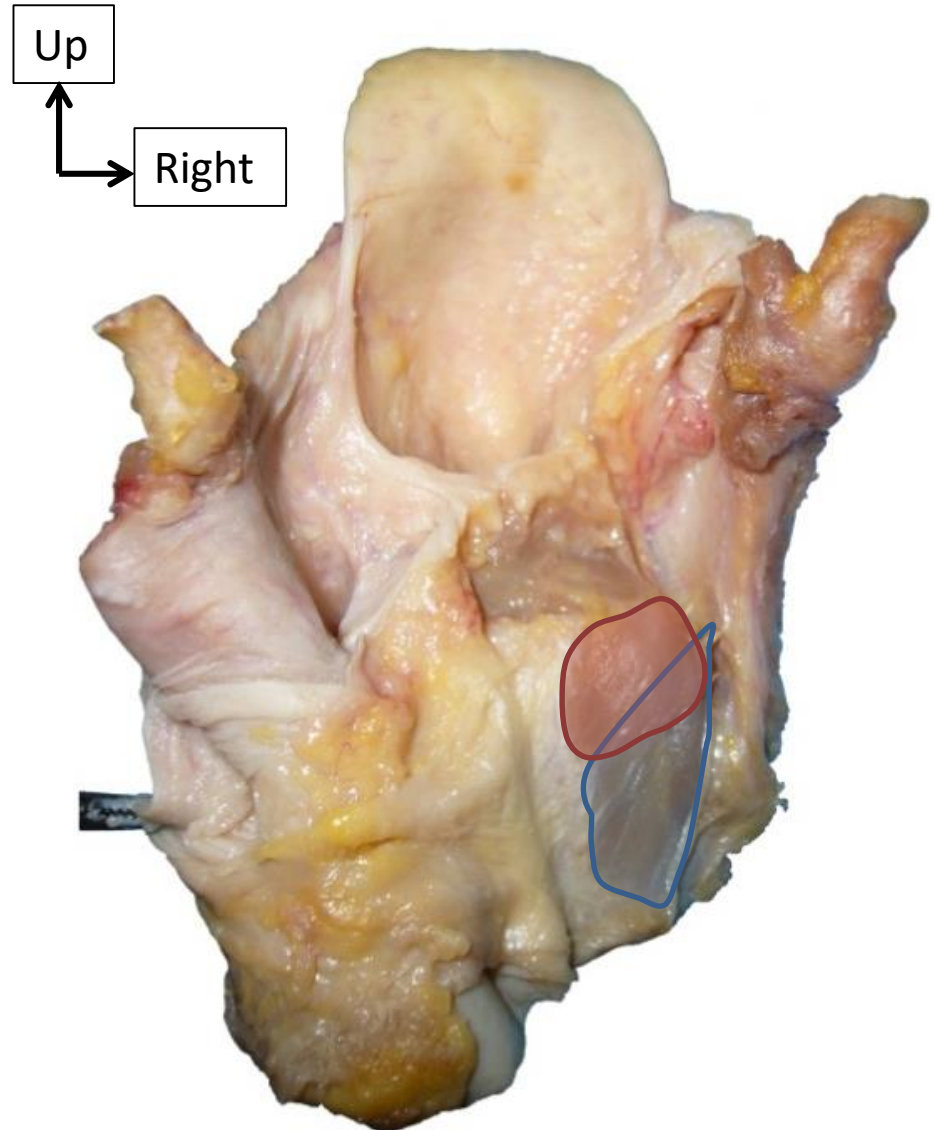
Right Arytenoid



Intrinsic laryngeal muscles

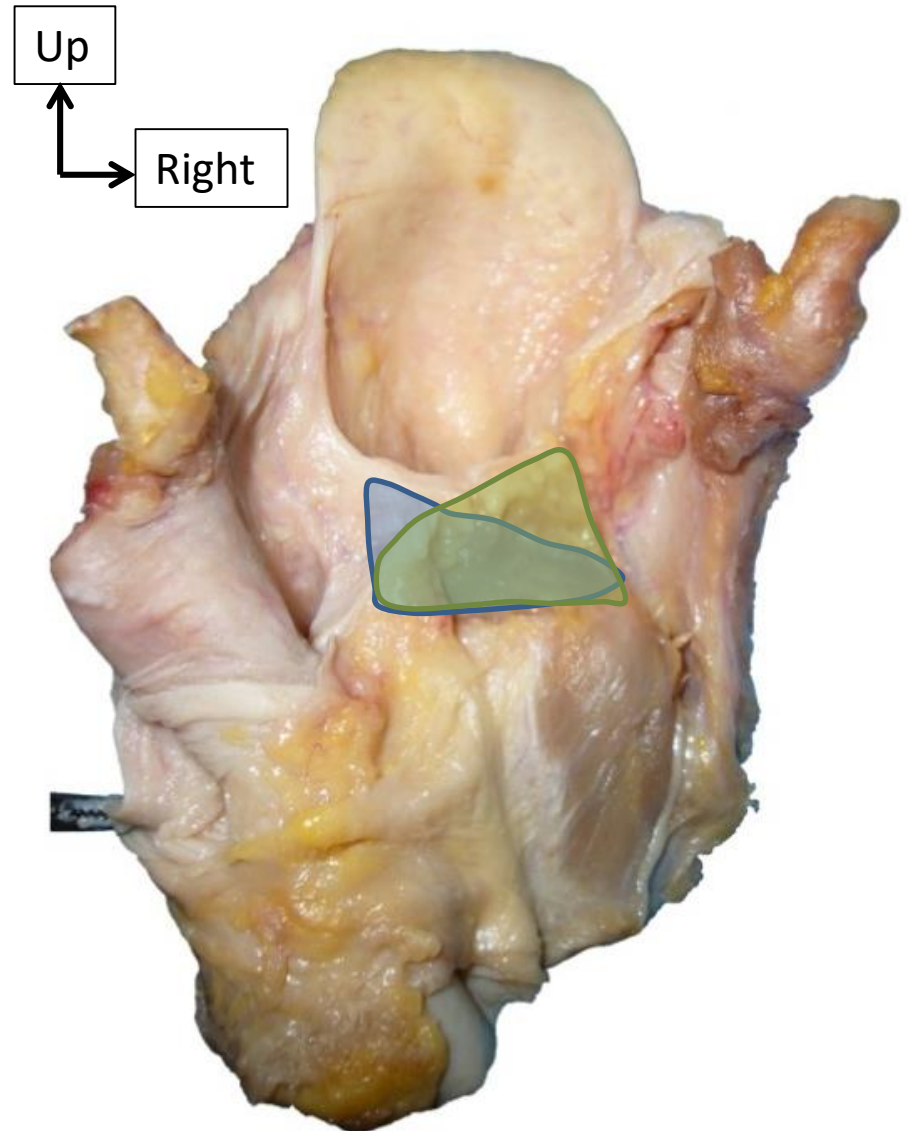
Posterior Crico-Arytenoid Muscle (PCA)

- Abduction of the vocal folds
 - Breathing muscle



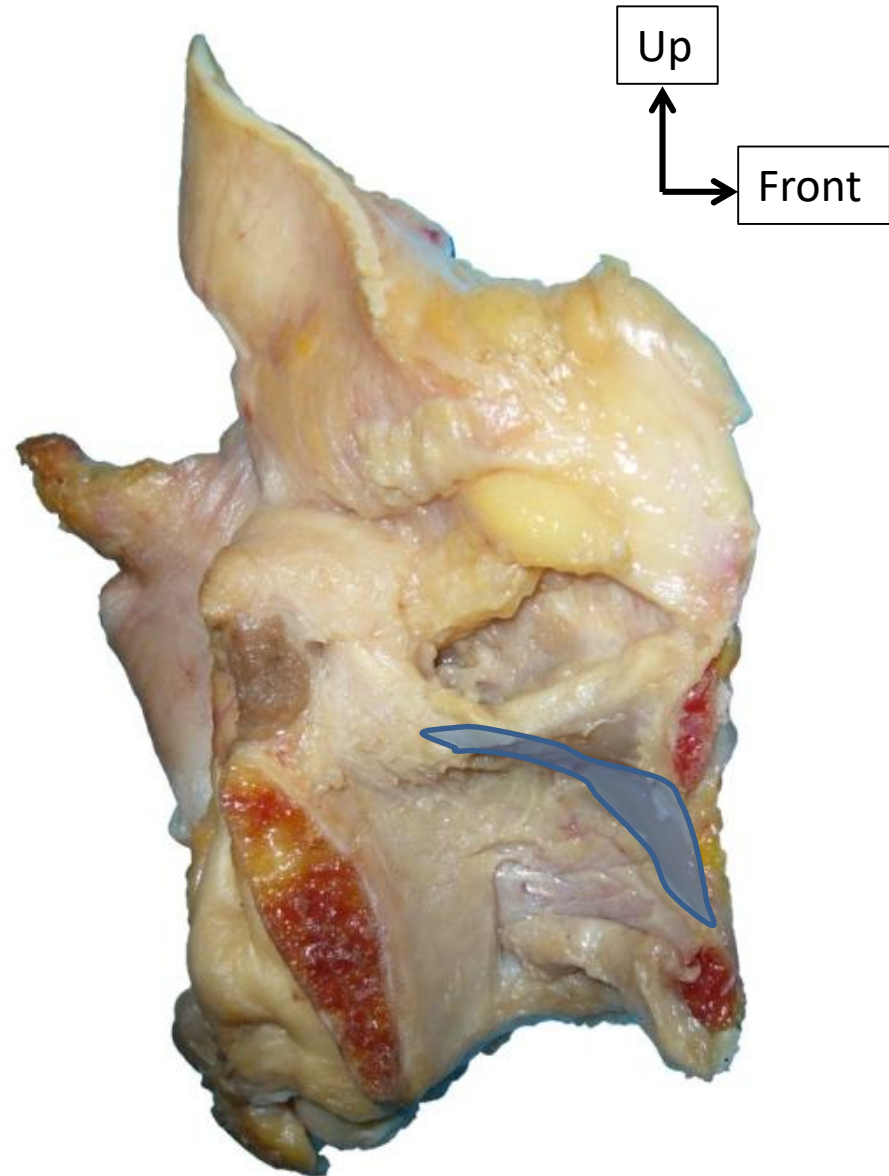
Inter-Arytenoid Muscle (IA)

- Adduction of the arytenoids



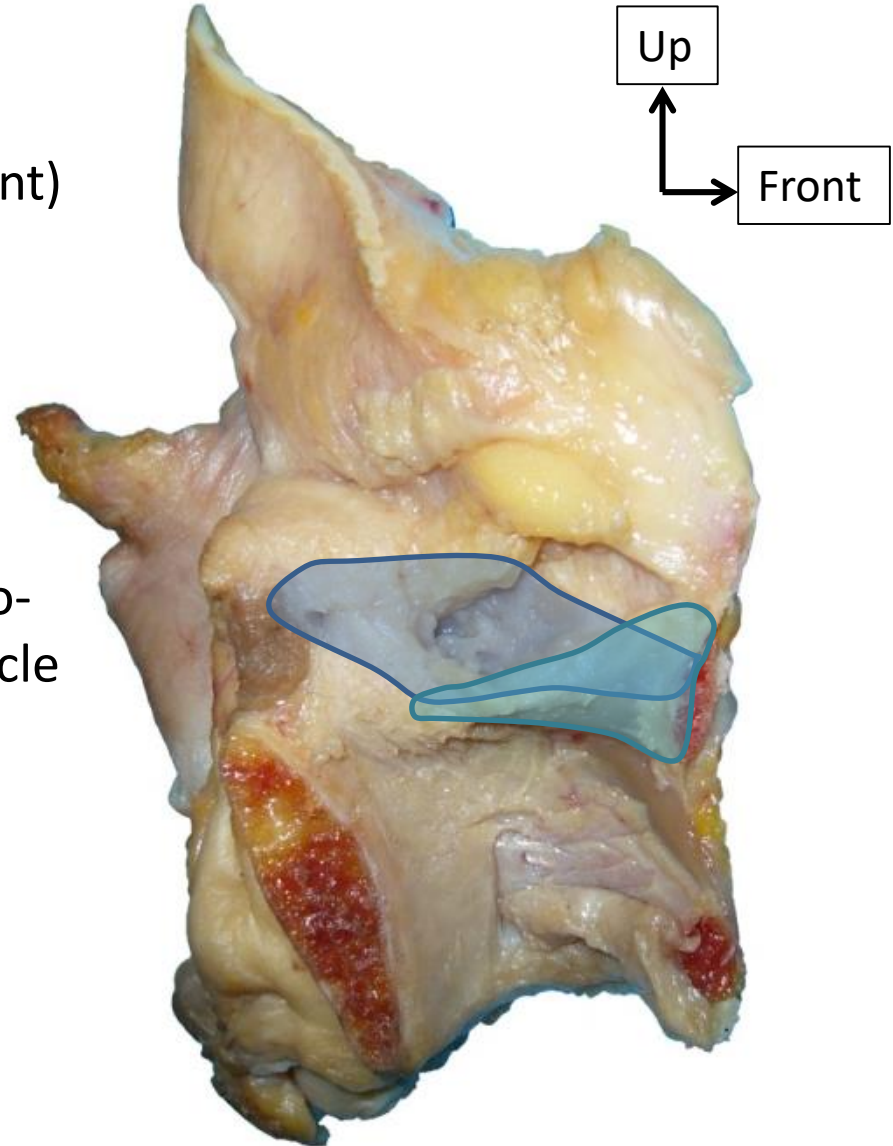
Lateral Crico-Arytenoid Muscle

- Adduction of the vocal process of the arytenoids
- Sharpening of the vocal fold edge



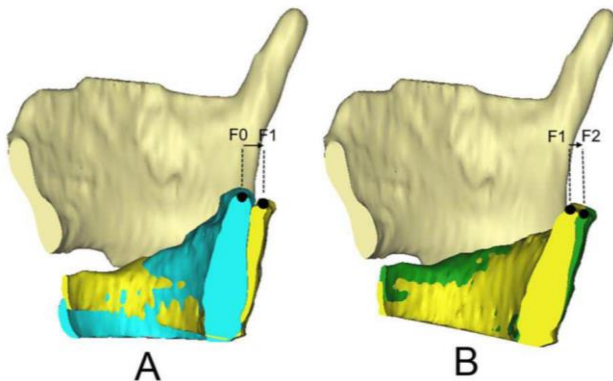
Thyro-Arytenoid Muscle

- Adduction of the vocal folds
 - (Action on the crico-arytenoid joint)
 - Action on the membranous part
- Shortening of the vocal folds
 - Rigidity of the vocal folds with co-contraction of crico-thyroid muscle

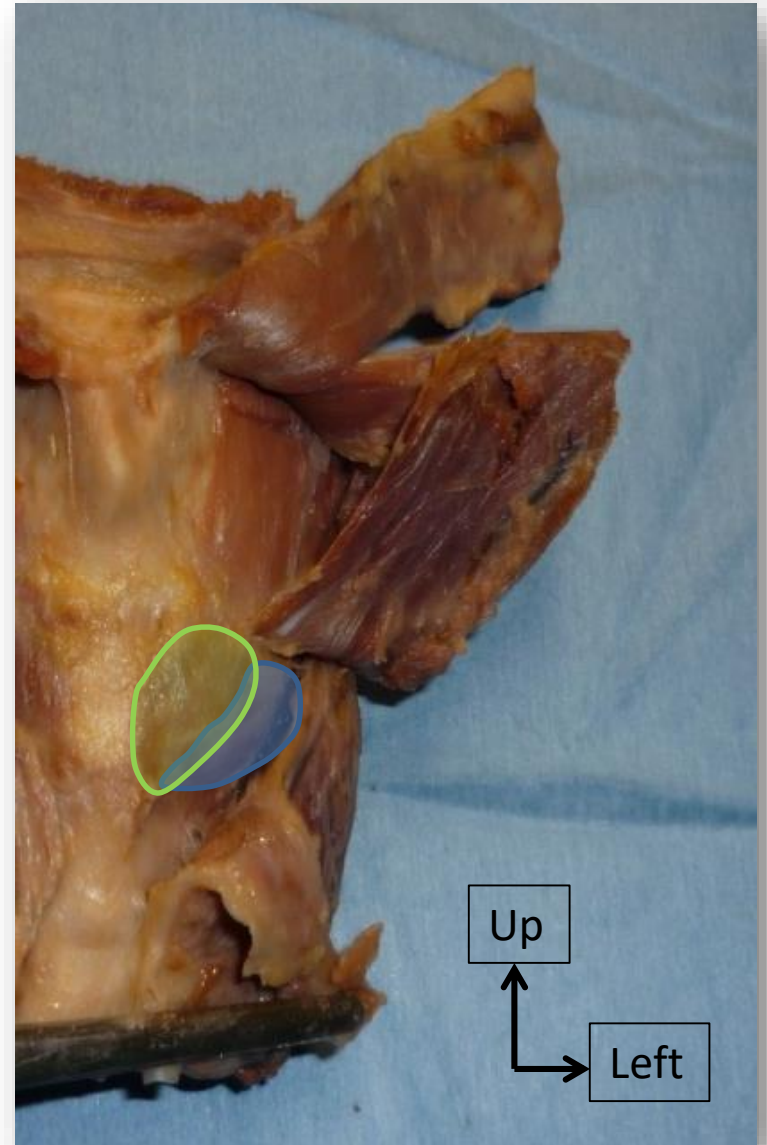


Crico-Thyroid Muscle

- Crico-thyroid tilt
 - Backward rotation of the cricoid in relation to the thyroid

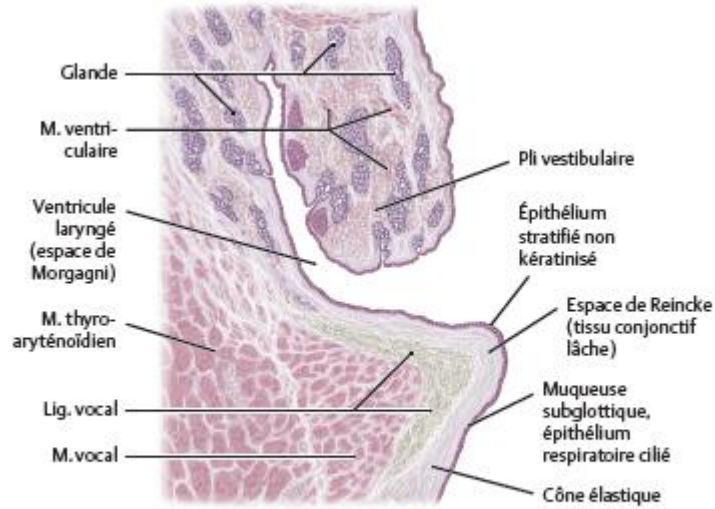


- Lengthening/tension of the vocal folds
- Adduction of the membranous part of the vocal folds

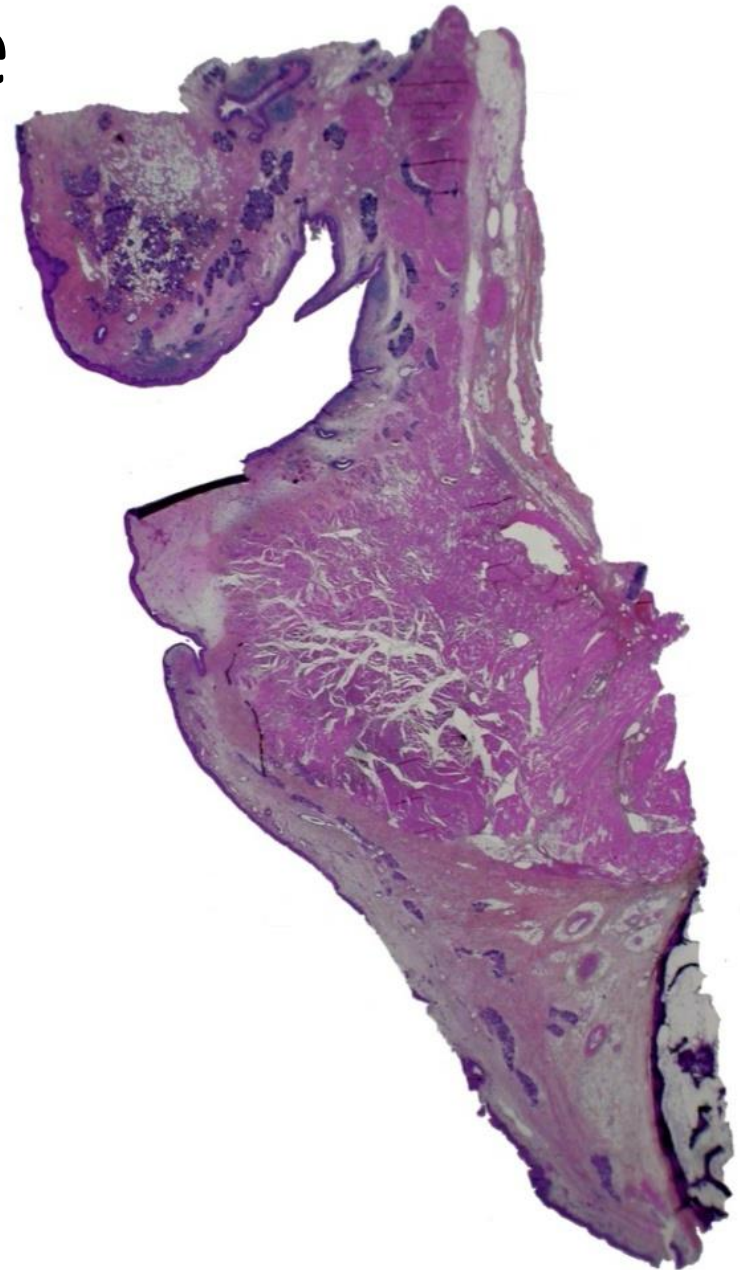


Vocal fold structure

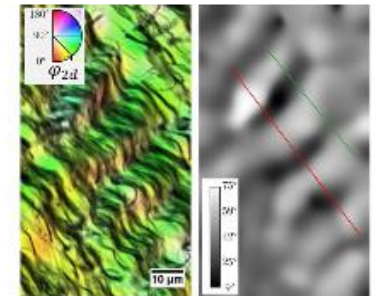
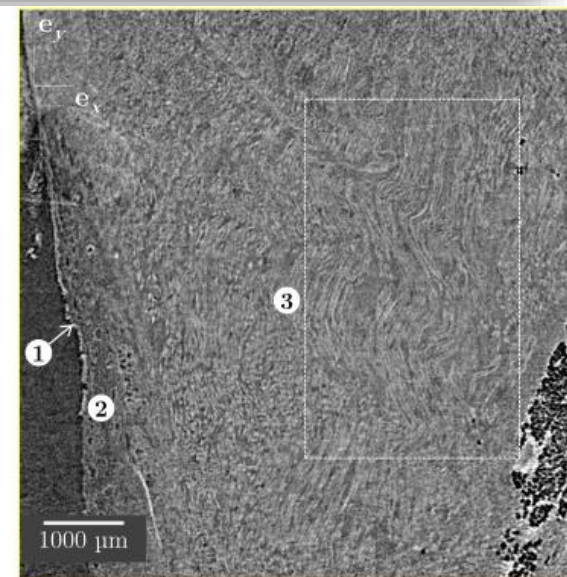
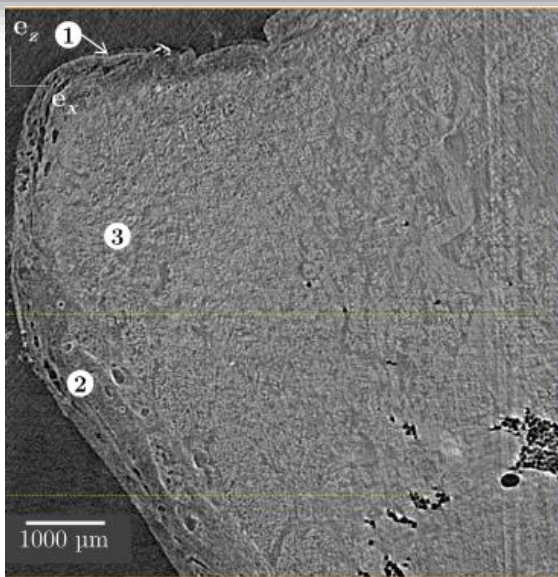
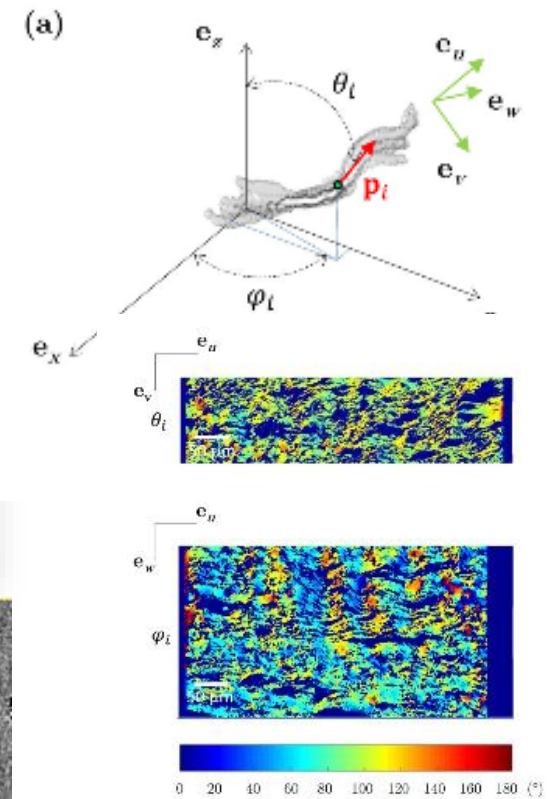
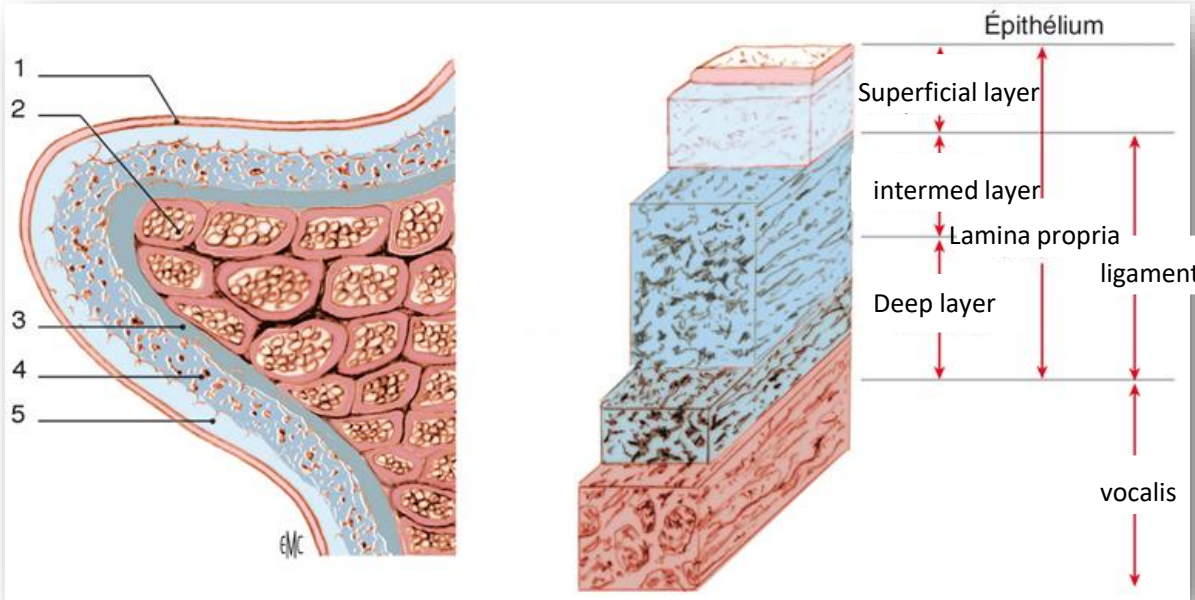
Vocal folds structure



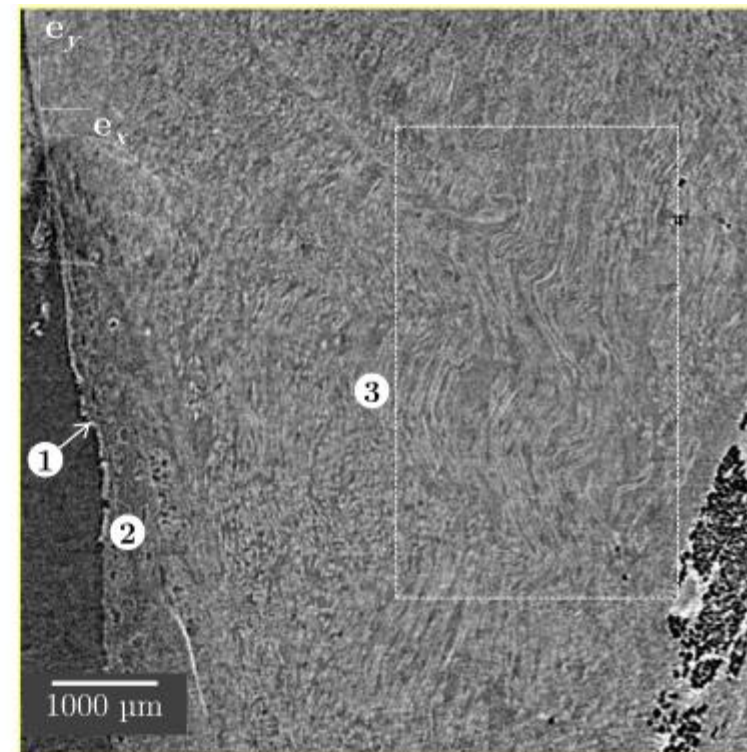
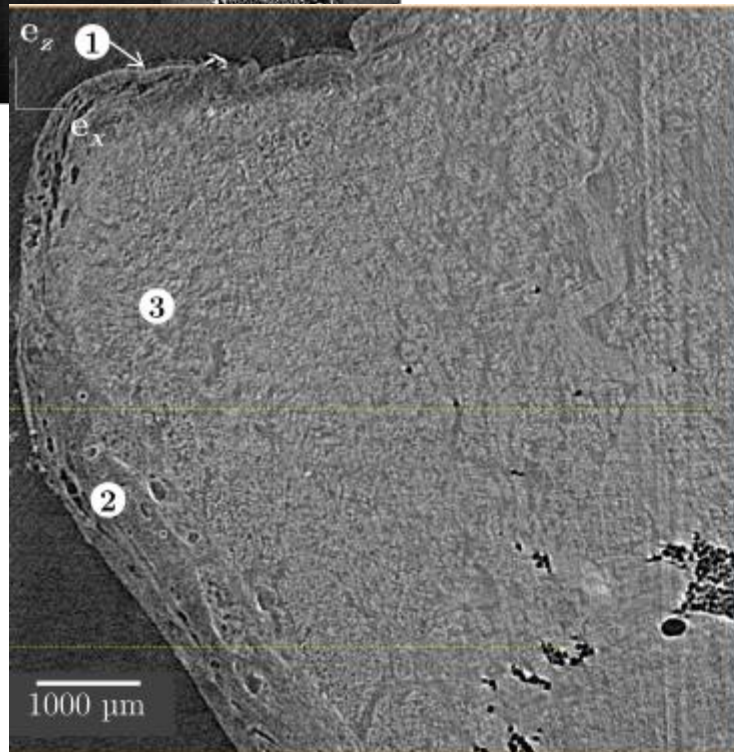
Structure d'un pli vocal, coupe histologique frontale schématique; vue postérieure



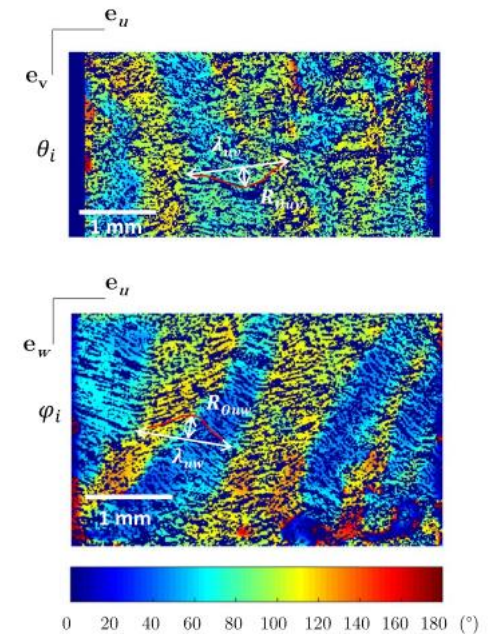
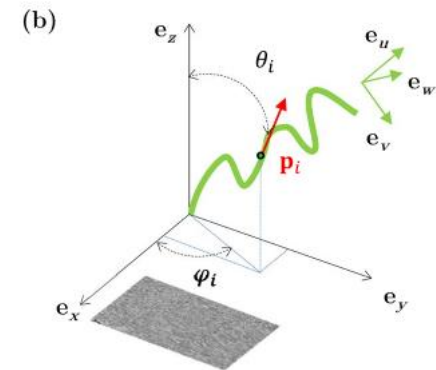
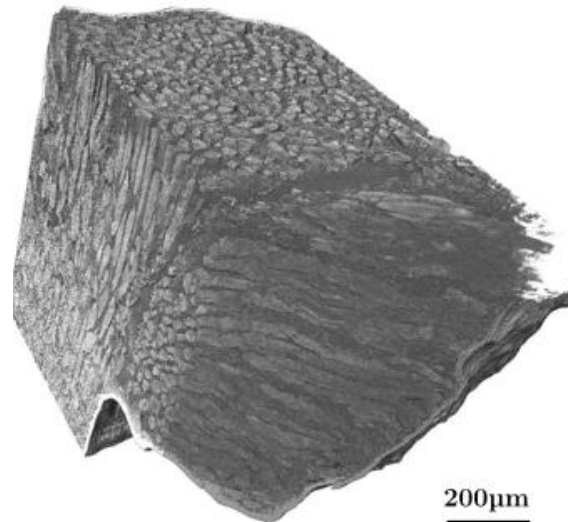
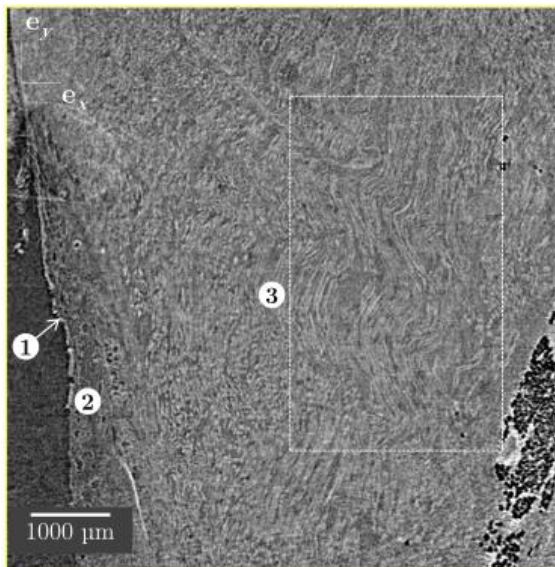
Vocal folds structure



Research of Lucie Bailly (Grenoble):
3D multiscale imaging of human vocal folds using
synchrotron X-ray microtomography in phase retrieval mode.
Bailly L, Cochereau T, Orgéas L, Henrich Bernardoni N,
Rolland du Roscoat S, McLeer-Florin A, Robert Y, Laval X,
Laurencin T, Chaffanjon P, Fayard B, Boller E.
Sci Rep. 2018 Sep 18;8(1):14003. doi: 10.1038/s41598-018-
31849-w.

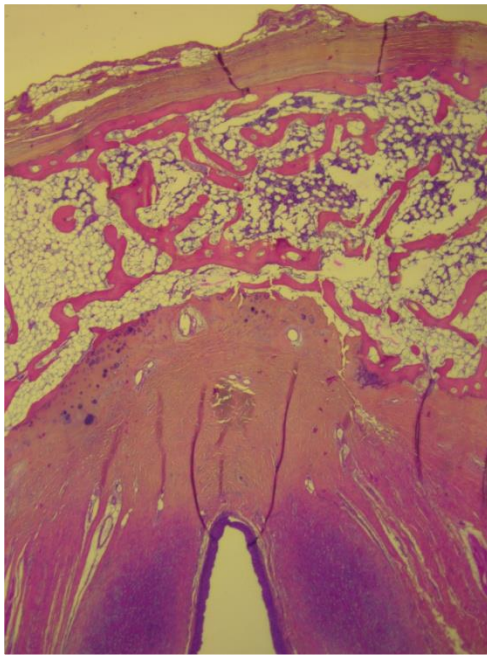


- Vocal muscle:
 - Close to the lamina propria,
 - Fibers orientated longitudinally
 - 1 mm and more from the lamina propria,
 - Some fibers orientated orthogonally
 - Transition between vocalis and LCA



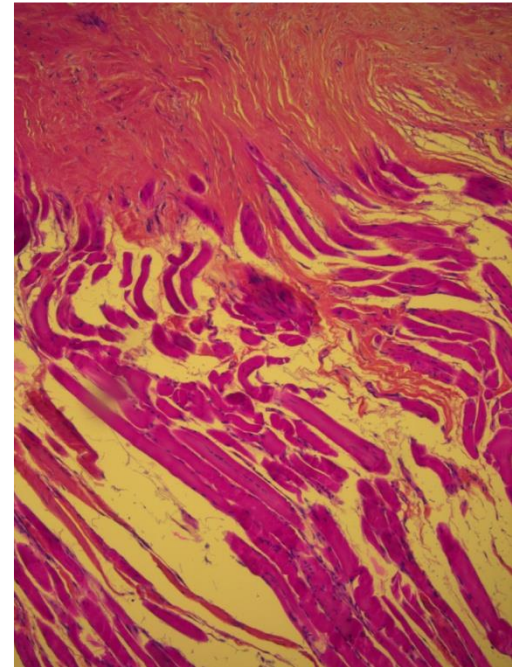
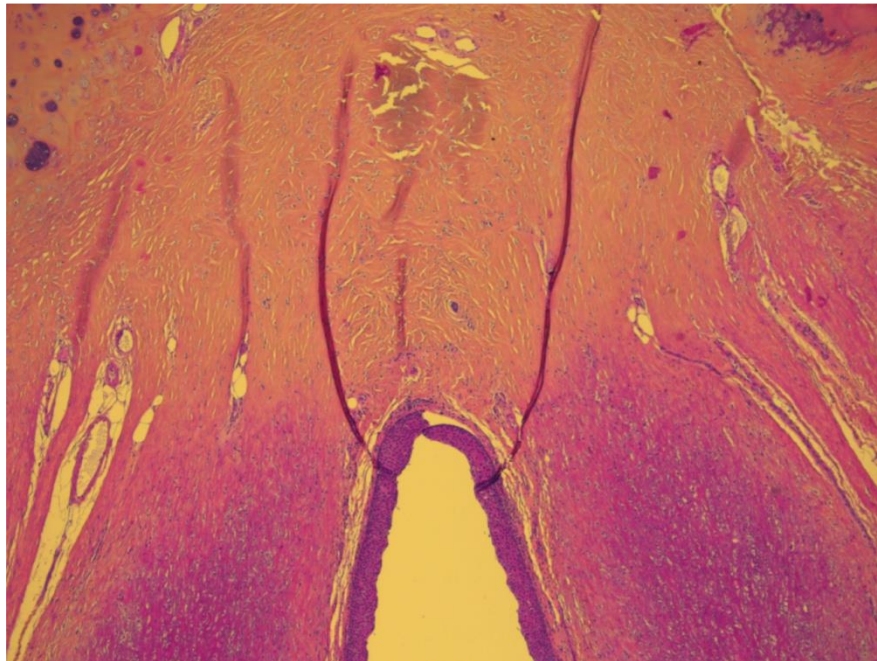
Bailly L, et al. 3D multiscale imaging of human vocal folds using synchrotron X-ray microtomography in phase retrieval mode.

Sci Rep. 2018 Sep 18;8(1):14003. doi: 10.1038/s41598-018-31849-w.



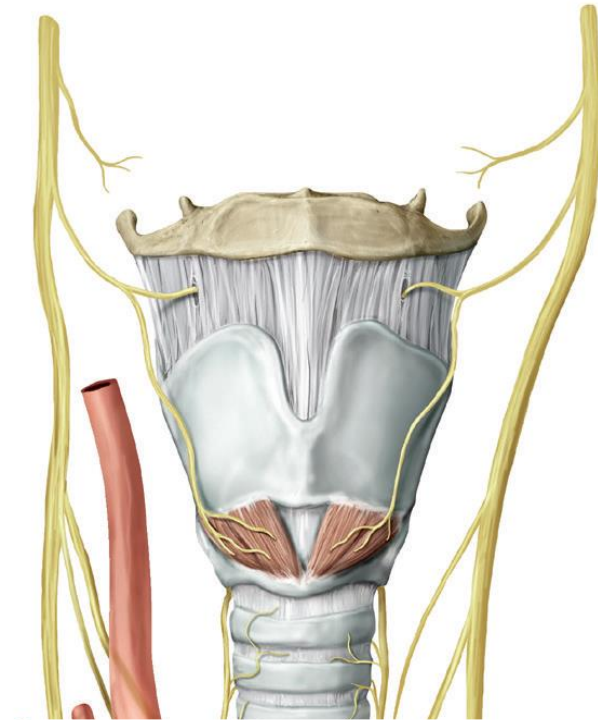
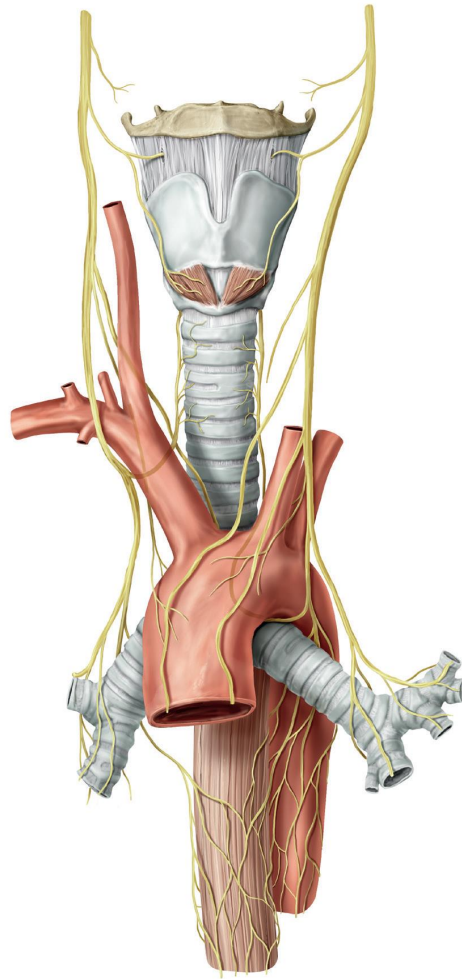
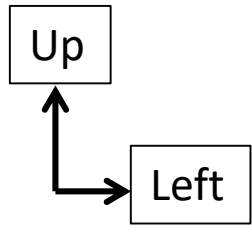
Anterior Commissure

- Maculae flavae
- Absence of périchondrium



Laryngeal innervation

Laryngeal innervation



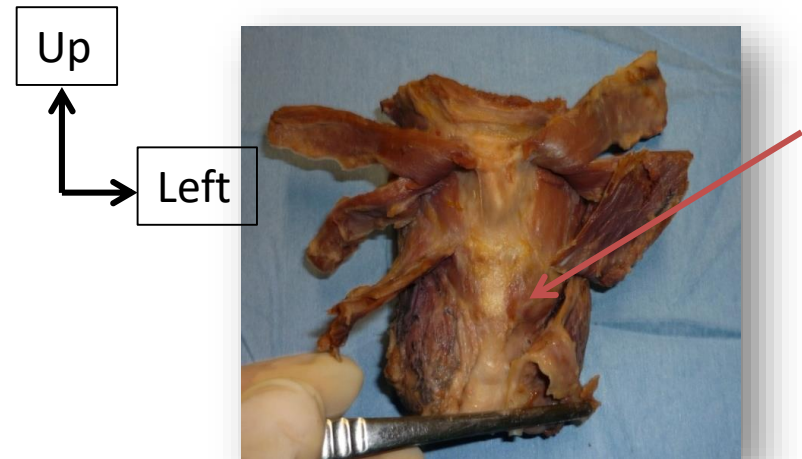
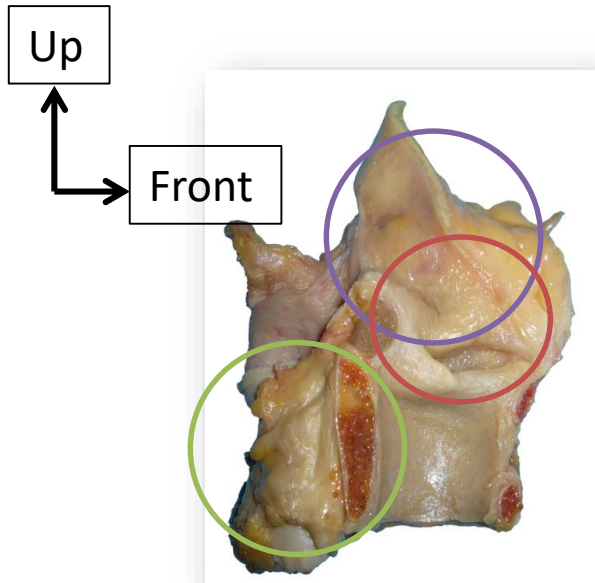
Supérieur Laryngeal Nerve-Ending



Superior laryngeal nerve trunk

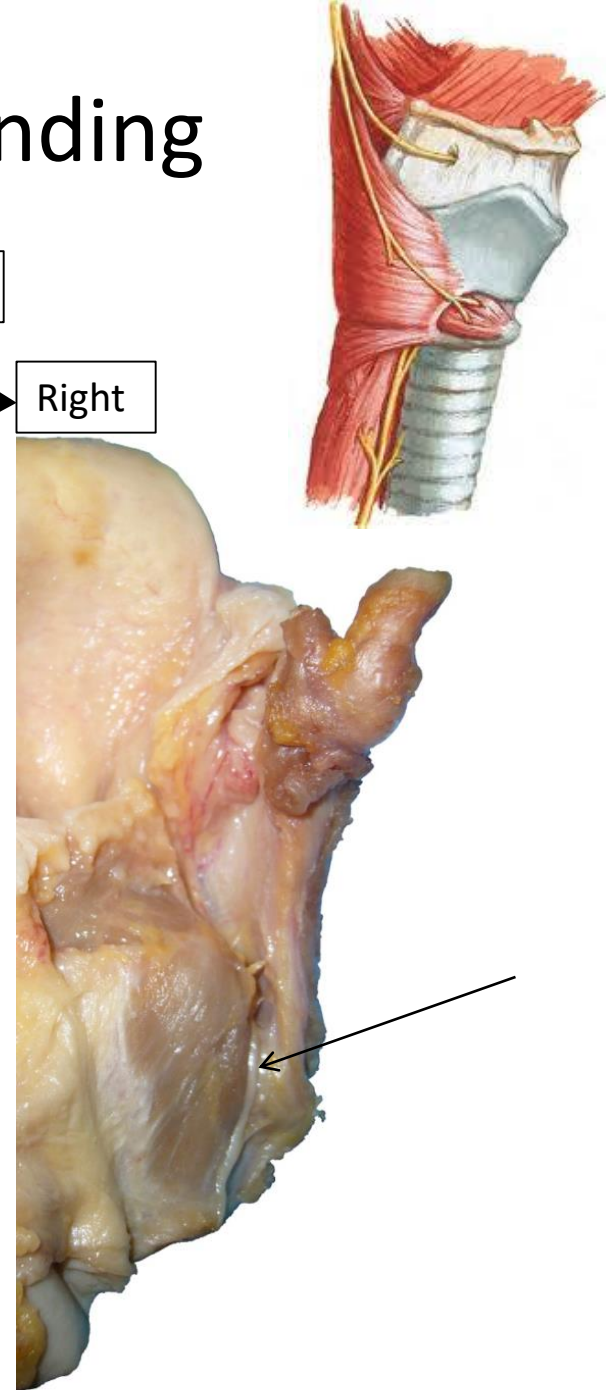
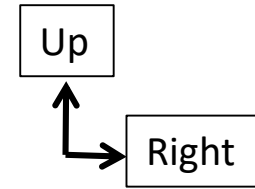
- Internal laryngeal nerve
 - Sensory
 - Laryngeal vestibule, glottic level, posterior wall

- External laryngeal nerve
 - Motricity
 - Crico-thyroid Muscle



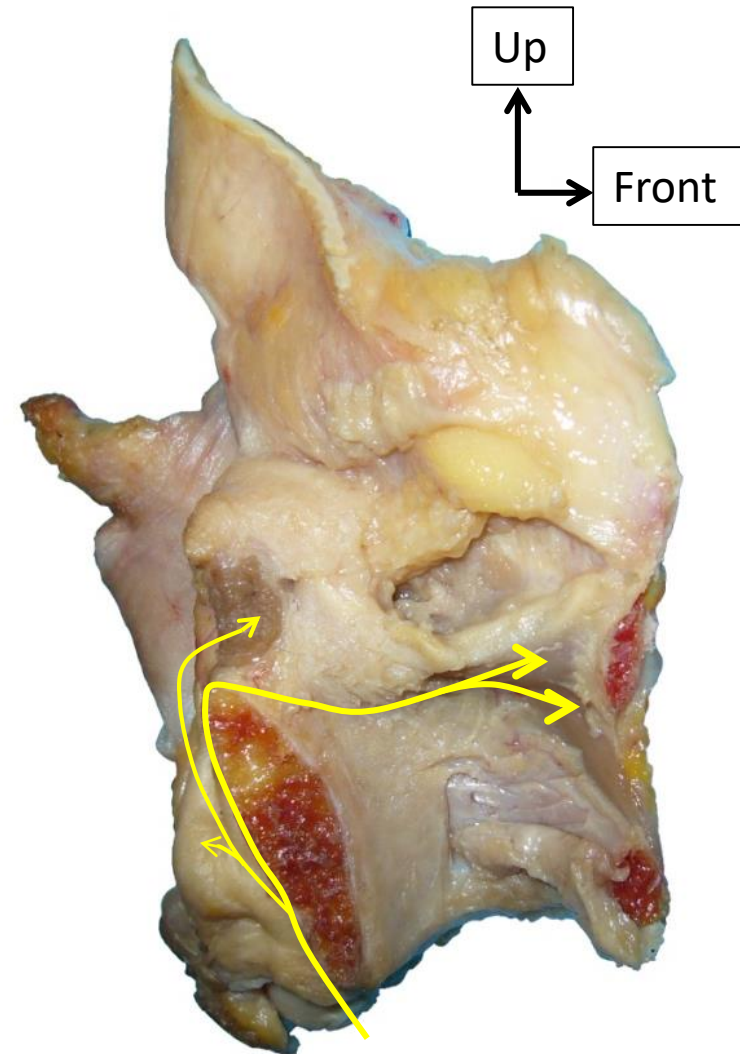
Inferior Laryngeal Nerve-Ending

- Enters in the larynx
 - Under the inferior pharyngeal constrictor
 - Behind the crico-thyroid joint
 - Under the hypopharynx mucosa



Inferior Laryngeal Nerve-Ending

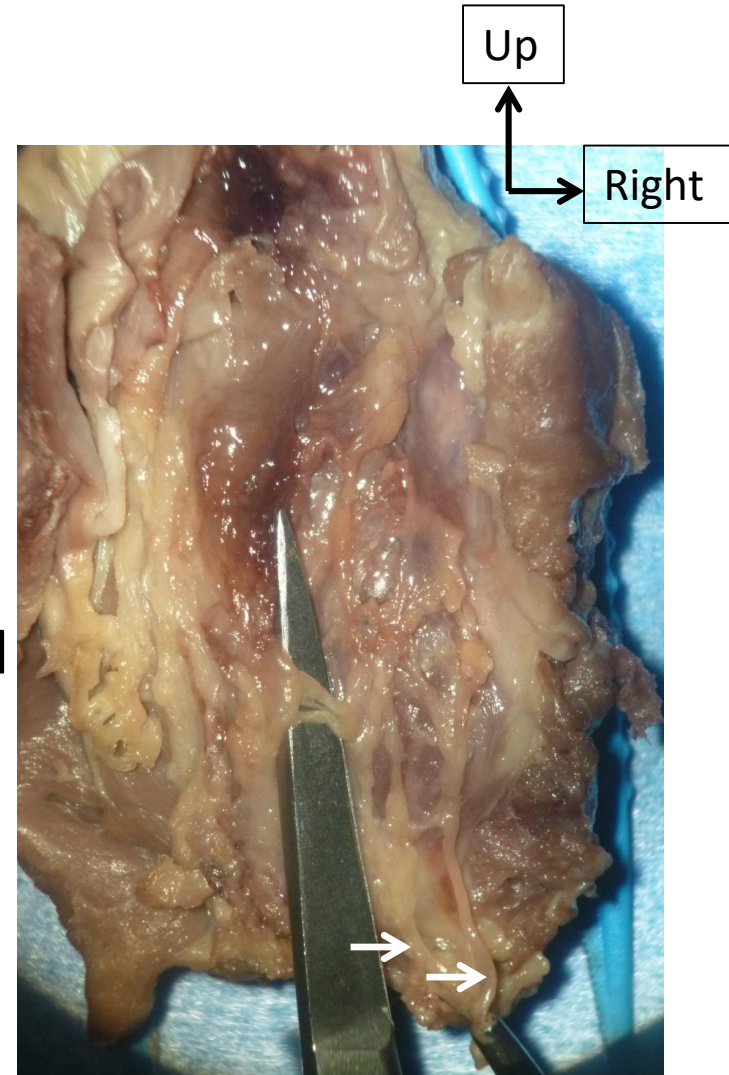
- Motor nervous branches
 - For all the intrinsic laryngeal muscles
 - EXCEPT crico-thyroid muscle



Inferior Laryngeal Nerve-Ending

2 Terminal branches

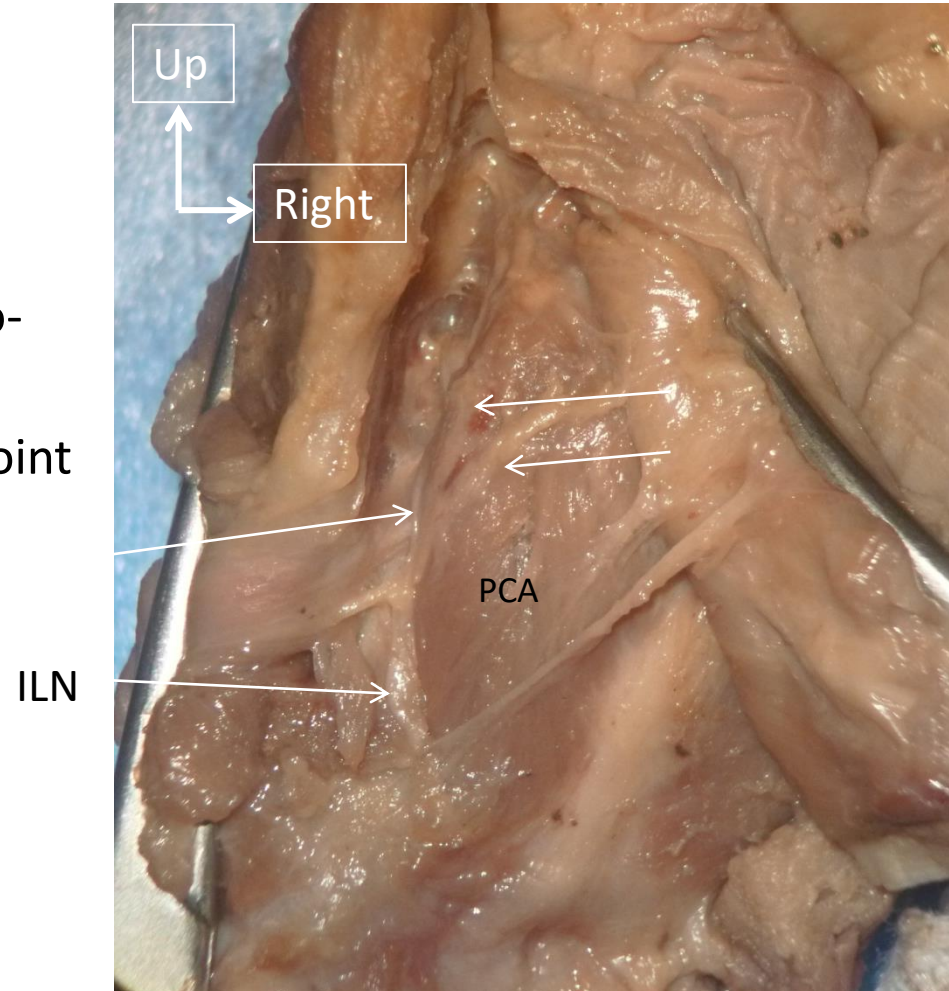
- Posterior
 - Runs on the posterior aspect of the PCA, under the pharyngeal mucosa
 - Communication with the internal laryngeal nerve
 - Galien ansa



Inferior Laryngeal Nerve-Ending

2 Terminal branches

- Anterior
 - Motor Innervation of the intrinsic muscles
 - Vertical segment: behind the cricothyroid joint
 - Genu: Anterior curve, above the joint
 - Oblique segment, laterally to LCA muscle

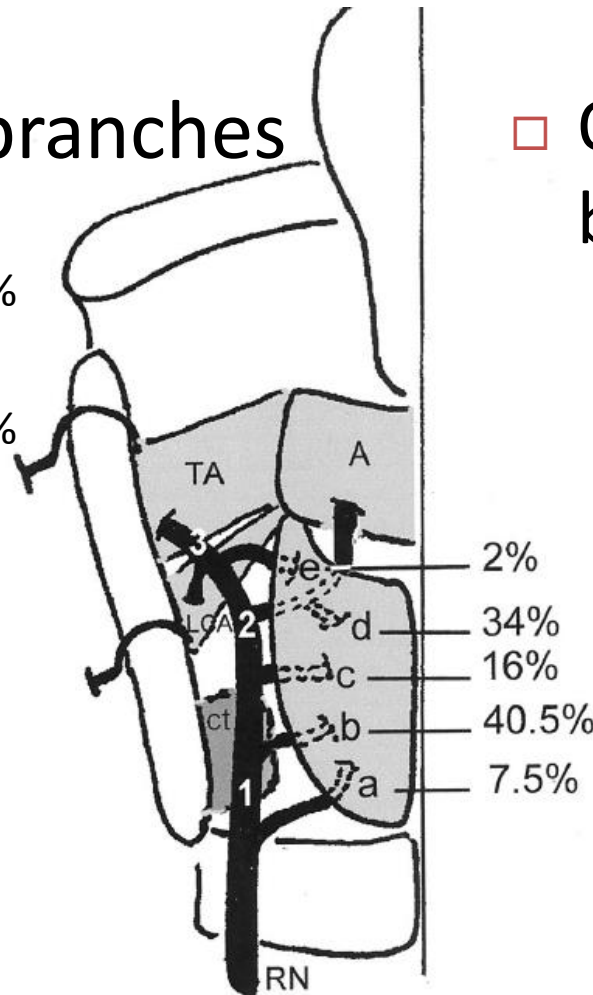


Inferior laryngeal Nerve :

variability of the terminal branches

- Number of branches

- 1 branch=7.3%
- 2 branches=42.7%
- 3 branches=34%
- 4 branches=10.7%
- 5 branches=4.7%
- 6 branches: 0.6%

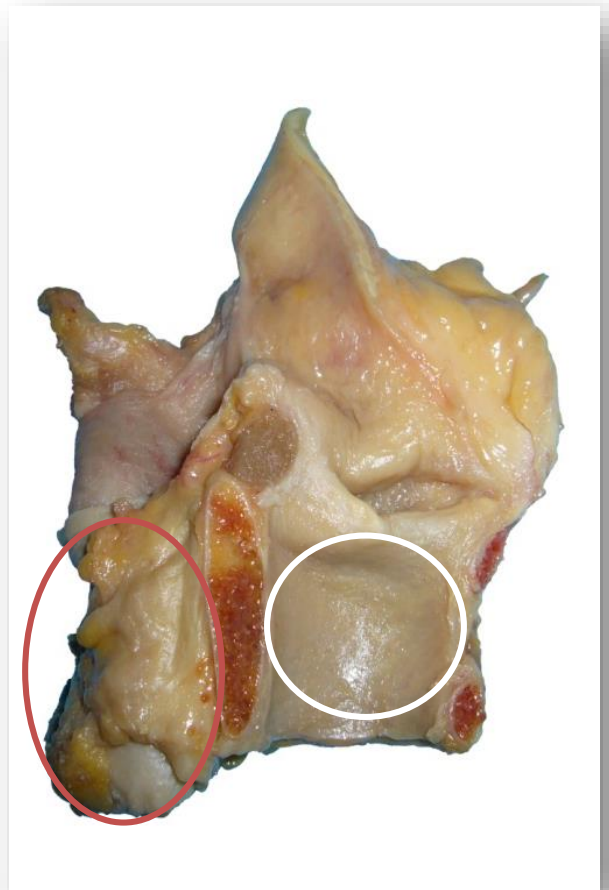


- Origins of the PCA branches

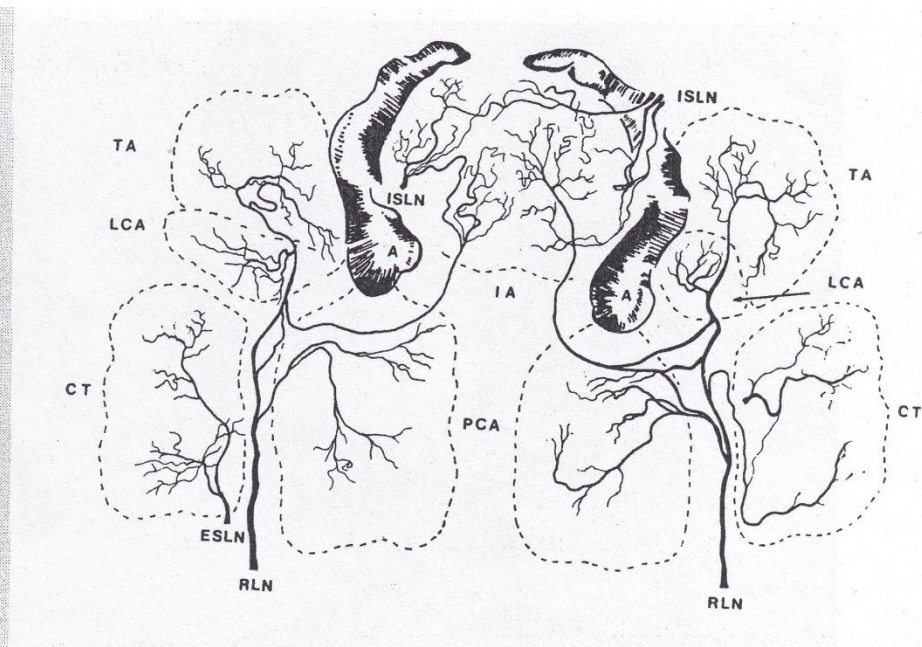
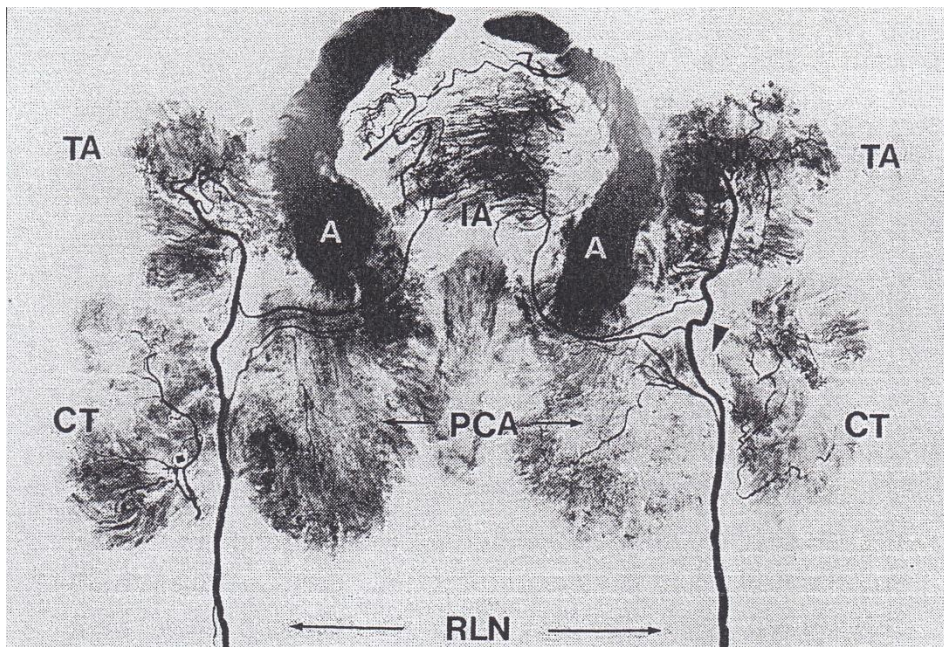
- A: vertical segment under CT joint
- b: vertical segment behind CT joint
- c: vertical segment above CT joint
- d=genu, common origin with IA nerve branch
- e=oblique segment, between the IA and LCA branches

Inferior laryngeal nerve-Ending

- Sensory branches
 - Piriform sinus
 - Subglottic space



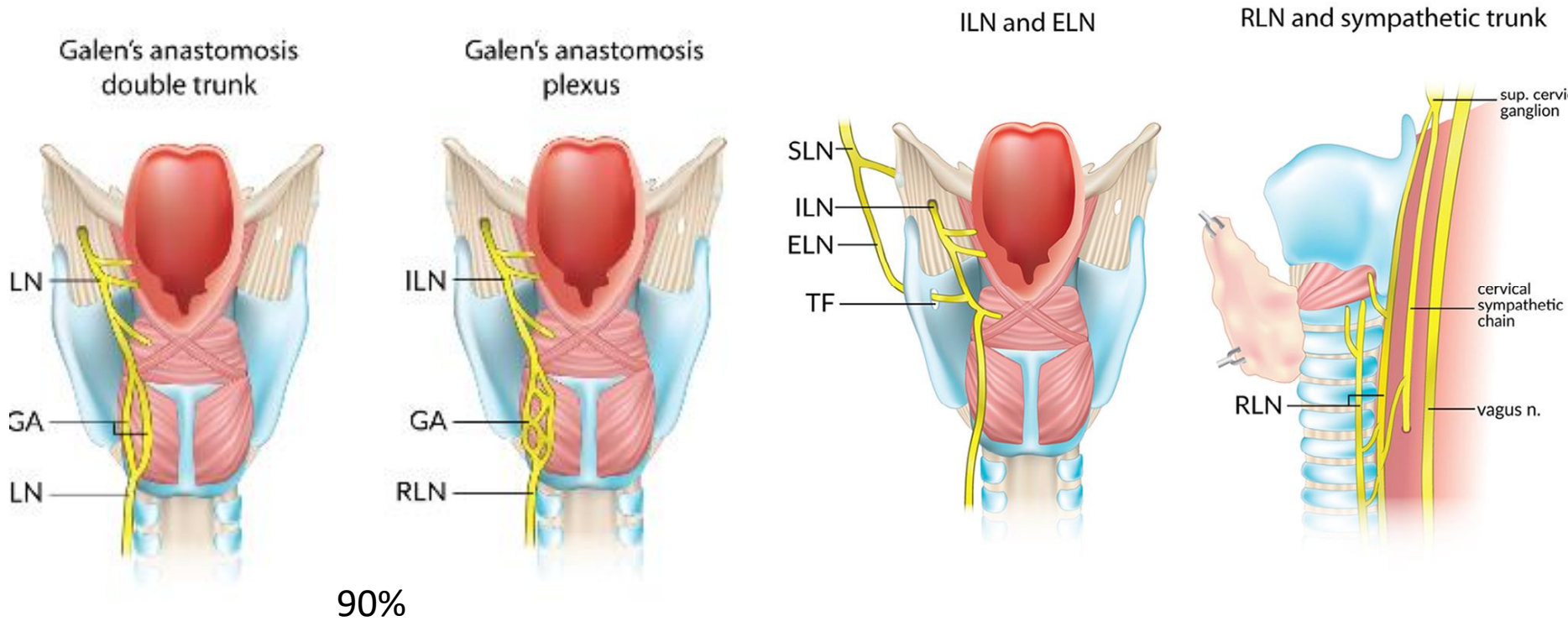
Communications between ILN and SLN



Sanders I, Wu BL, Mu L, Li Y, Biller HF.

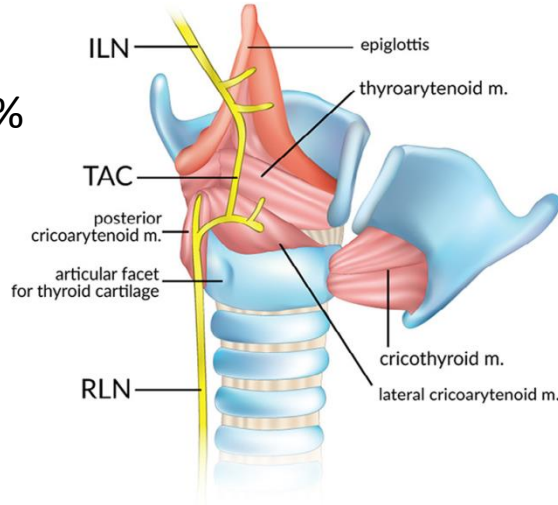
The innervation of the human larynx. Arch Otolaryngol Head Neck Surg. 1993 Sep;119(9):934-9.

Communications between ILN and SLN



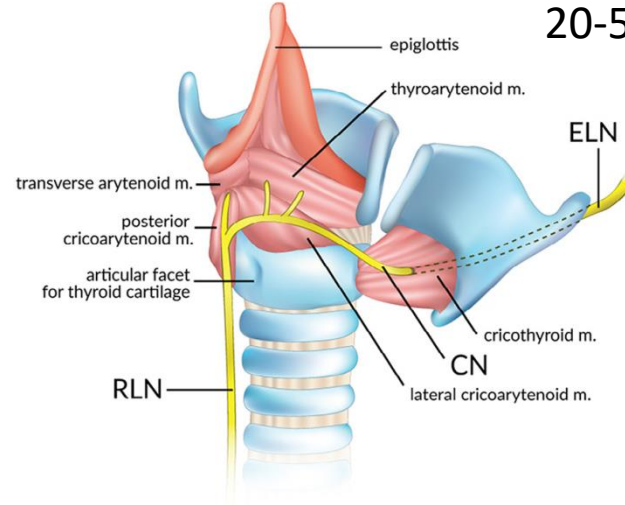
Thyroarythenoid communication

8-15%



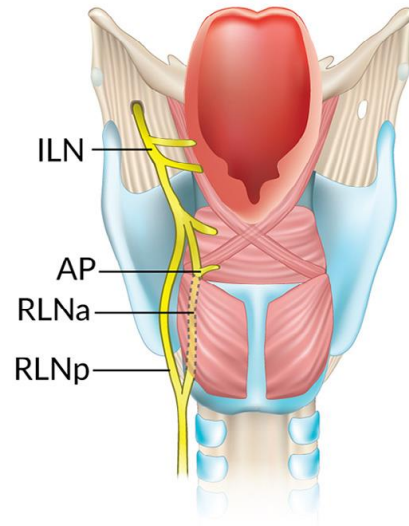
Communication between ELN and RLN

20-50%



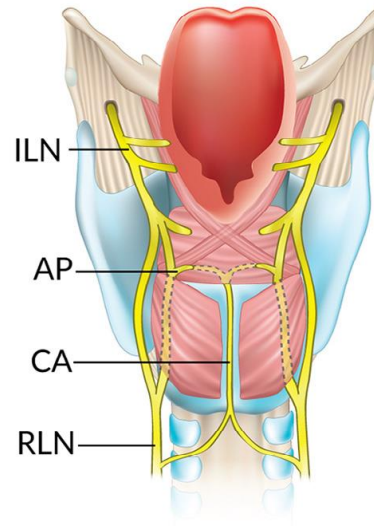
Arytenoid plexus

70%



Cricoid communication

20%



Thank you for your attention!

