Motorized Cricothyroid Tilt Control on human excised larynx

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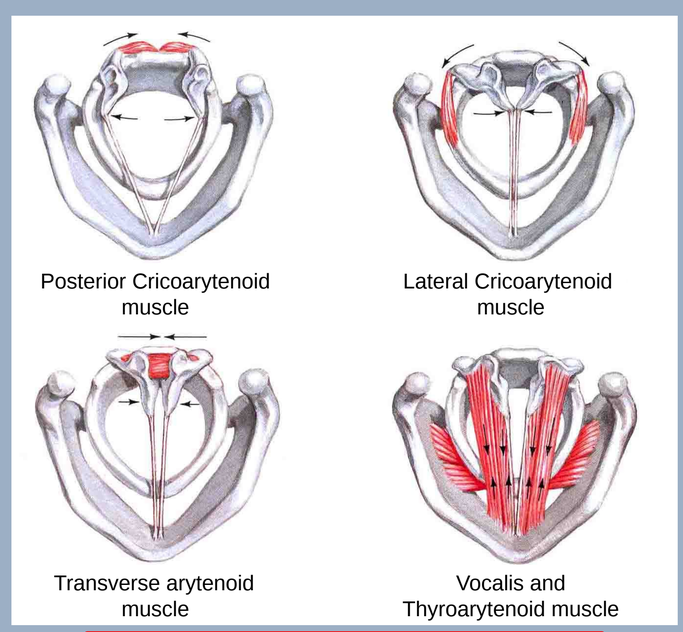
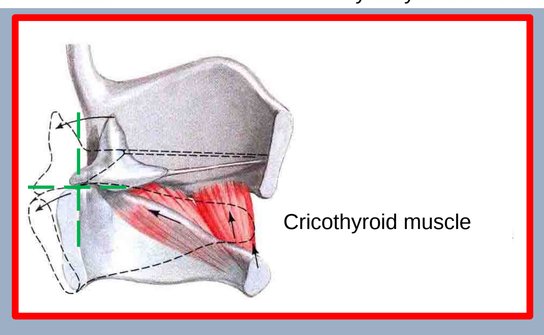
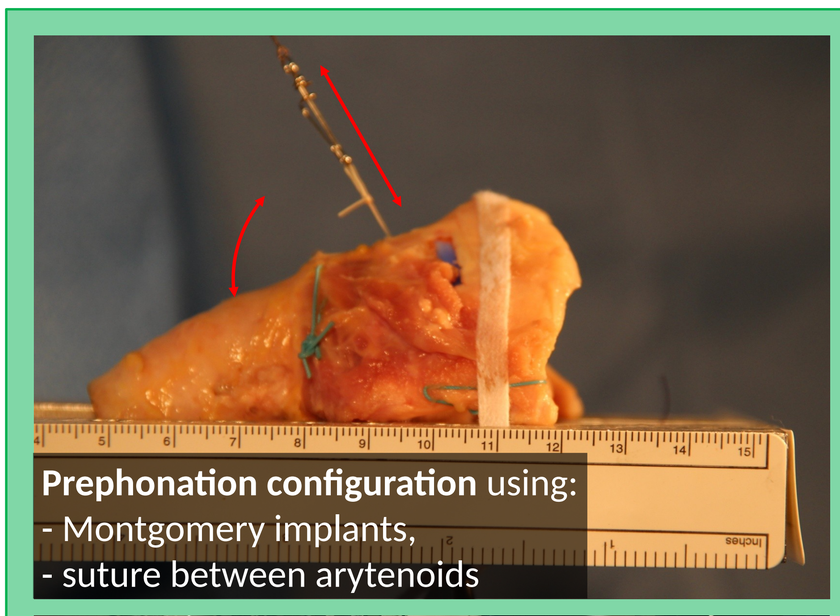
Introduction

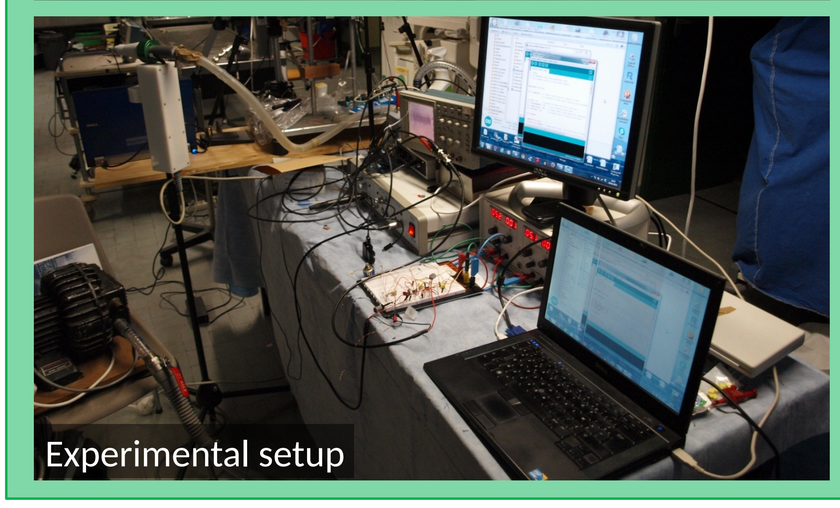
A controlled human phonation needs the coordination of several extrinsic and intrinsic muscles.
In order to study the contribution of the Cricothyroid muscle (CT), we implement a mechanical control of excised human larynx able to finely reproduce actions of the CT and measure its consequences on phonation.

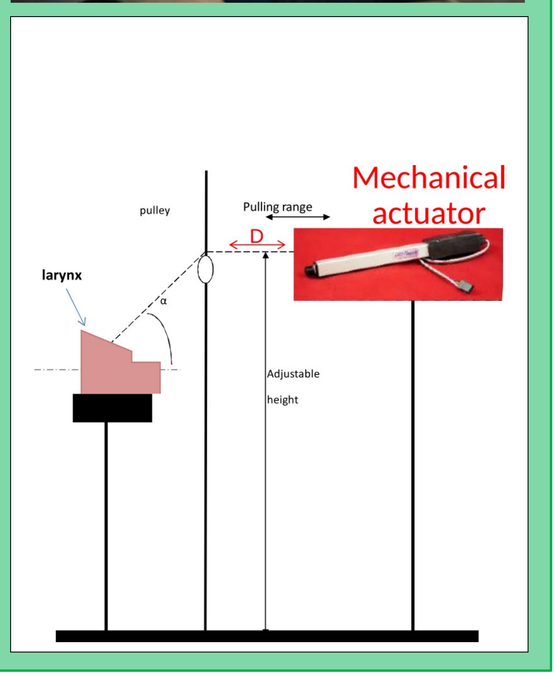
Main Intrinsic Laryngeal Muscles



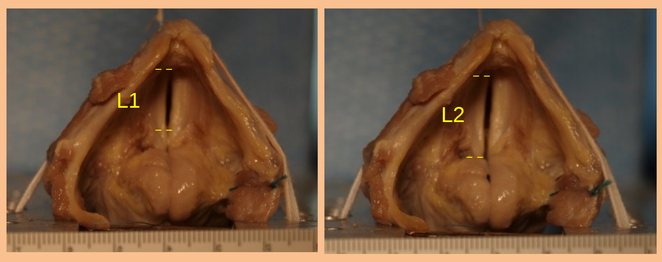


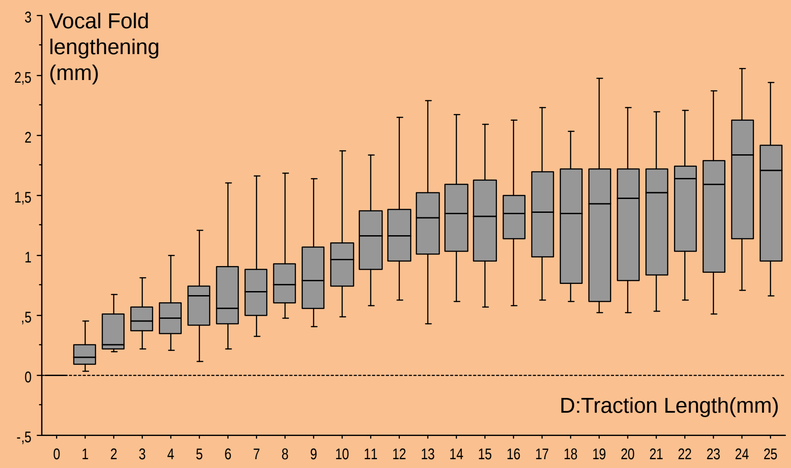






Effect on lengthening and tension of vocal folds

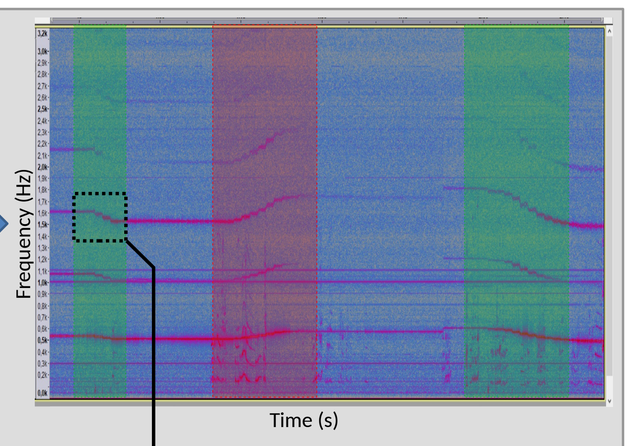


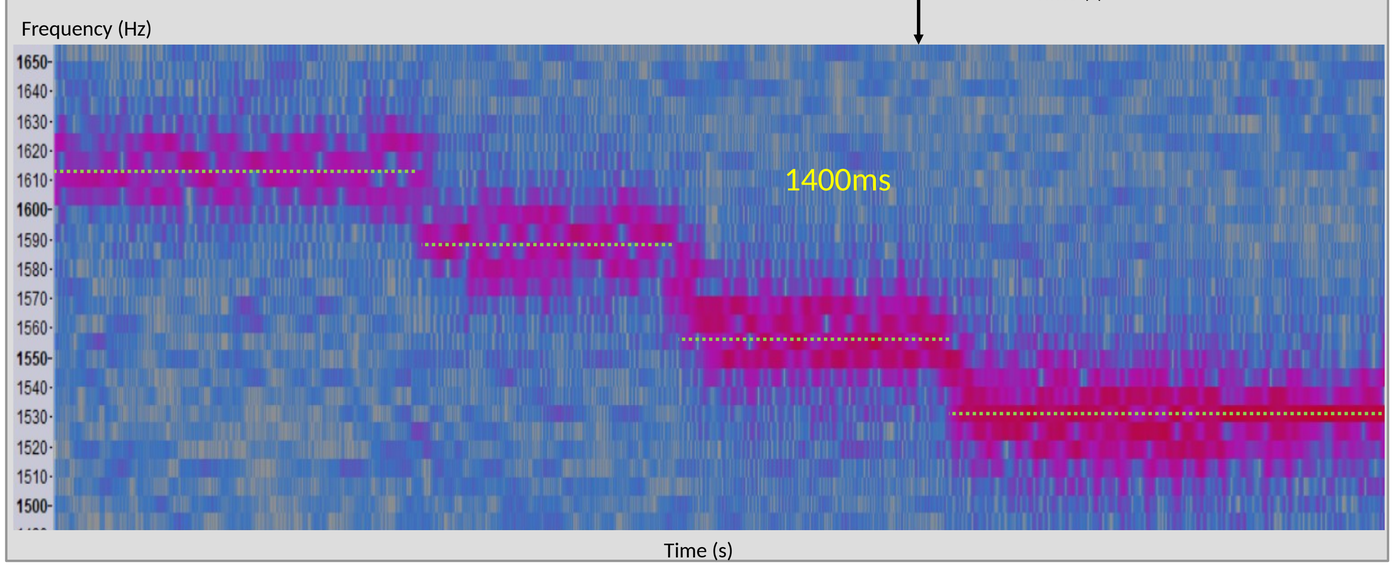


Effect on phonation (F_o)

Sequence of traction/release cycles on the mechanical actuator (+/- 1mm step series)

Limited effective range





Discussion

This pilot study **validates the motorized Cricothyroid tilt,** by checking its effects onto:
- the **length of vocal folds**
- The phonatory **fundamental frequency** (F_o): traction increases F_o, while relaxation decreases F_o.

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References

[1] Garcia and Herbst, Anthropological Science 126(1):9-17, 2018
[2] Legou, Lagier, Silva, Henrich, Champsaur and Giovanni, *Test bench for human excised larynx studies*, MAVEBA, Florence, 2015
[3] Lagier, Legou, Champsaur, Henrich and Giovanni, *Control of the Glottal Configuration in Ex Vivo Human larynges*, Voice Fundation Conference, Philadelphia, 2015