

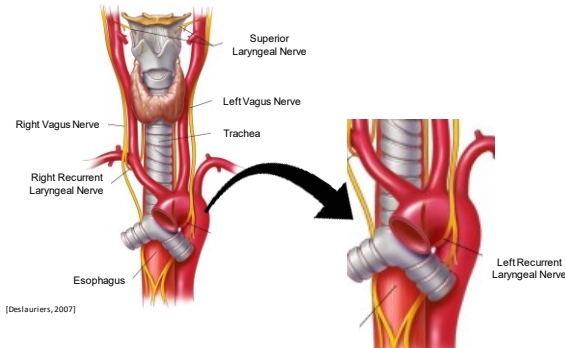
Inverse Finite Element of the Aortic Arch, Implications for UVP Patients

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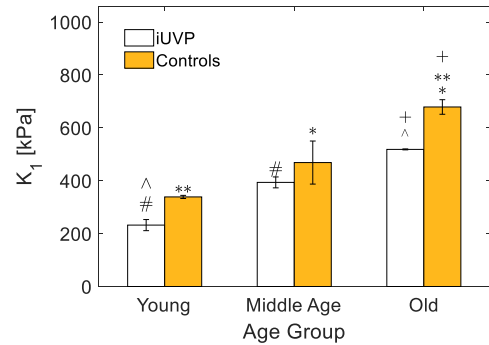
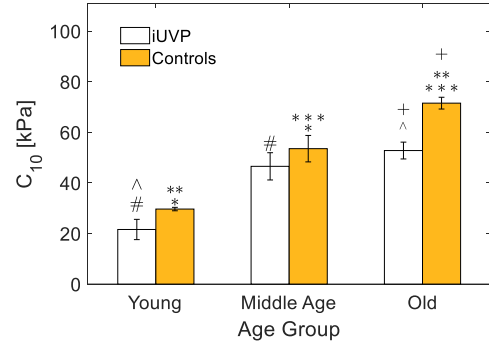
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INTRODUCTION

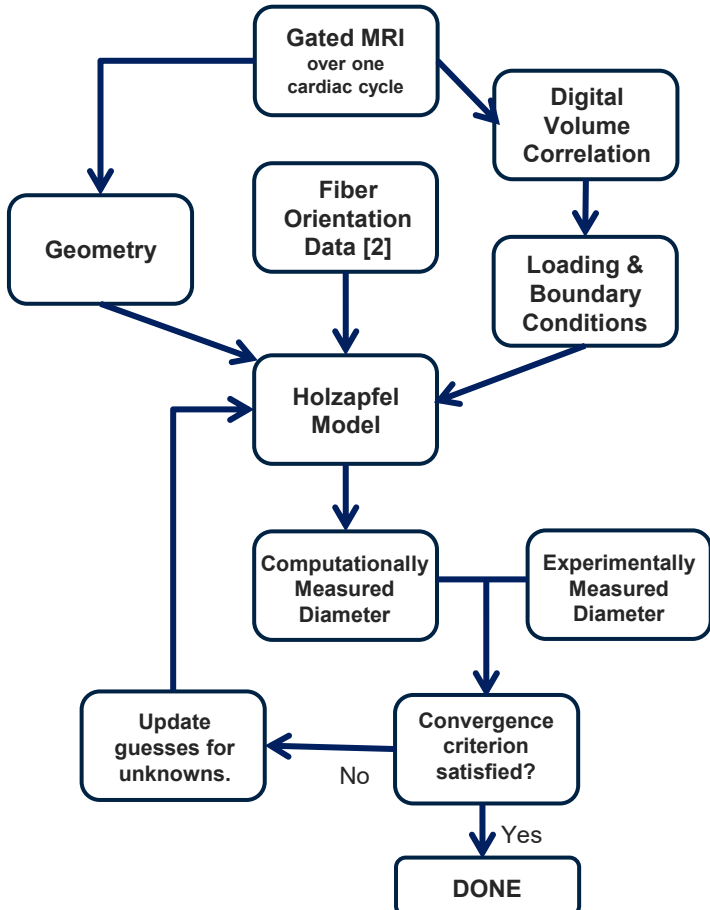
- Impairment of the recurrent laryngeal nerve (RLN) is the primary cause of unilateral vocal fold paralysis (UVP).
- On the left side, the RLN loops around the aortic arch, exposing the nerve to supraphysiological loads.
- Previously, our research group found that patients with iUVP presented higher aortic arch compliance than their age and gender matched controls [1].
- The purpose of this study was to investigate the difference in the mechanical properties of the aortic arch between iUVP patients and their age matched controls.



RESULTS



METHODS



CONCLUSIONS

- We confirmed that matrix and collagen fiber stiffness (C_{10} and K_1 , respectively) increases with age.
- Our study showed that matrix and fiber stiffness is smaller for the old iUVP group when compared to their age matched control. This suggests a lack of load-bearing, stiff structural components, which might allow for supraphysiological loads on the RLN.

FUTURE DIRECTIONS

- Include residual stress and smooth muscle cell contraction to the model. This could allow us to better describe the biomechanical behavior of the aortic arch.

ACKNOWLEDGMENTS

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REFERENCES

- [1] Behkam *et al*, JAP, 123:303-309, 2017.
- [2] Haskett *et al*, BMM, 9:725-736, 2010.

- Two-way ANOVA was performed with age and disease as the independent variables. Post-hoc analysis was done using Tukey's Test.