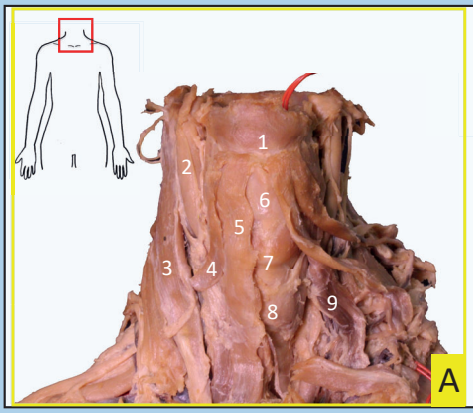
Relational Anatomy of the Larynx-Trachea-Lung Pathway

Coakley Medal Competition 2021

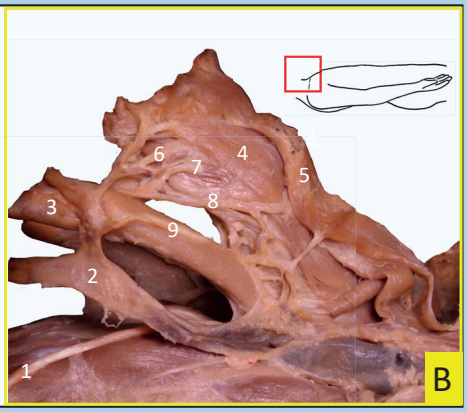
Conor Kennedy, GEM 2024

Muscles of the Larynx in-situ



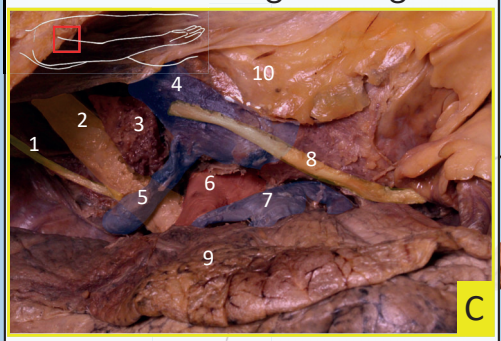
1. Hyoid Bone
2. Common Carotid Artery
3. Sternocleidomastoid Muscle
4. Omohyoid Muscle
5. Sternothyroid Muscle
6. Thyroid Cartilage
7. Cricoid Cartilage
8. Thyroid Gland
9. Sternothyroid Muscle (reflected)

Neurovasculature of the Larynx in-situ

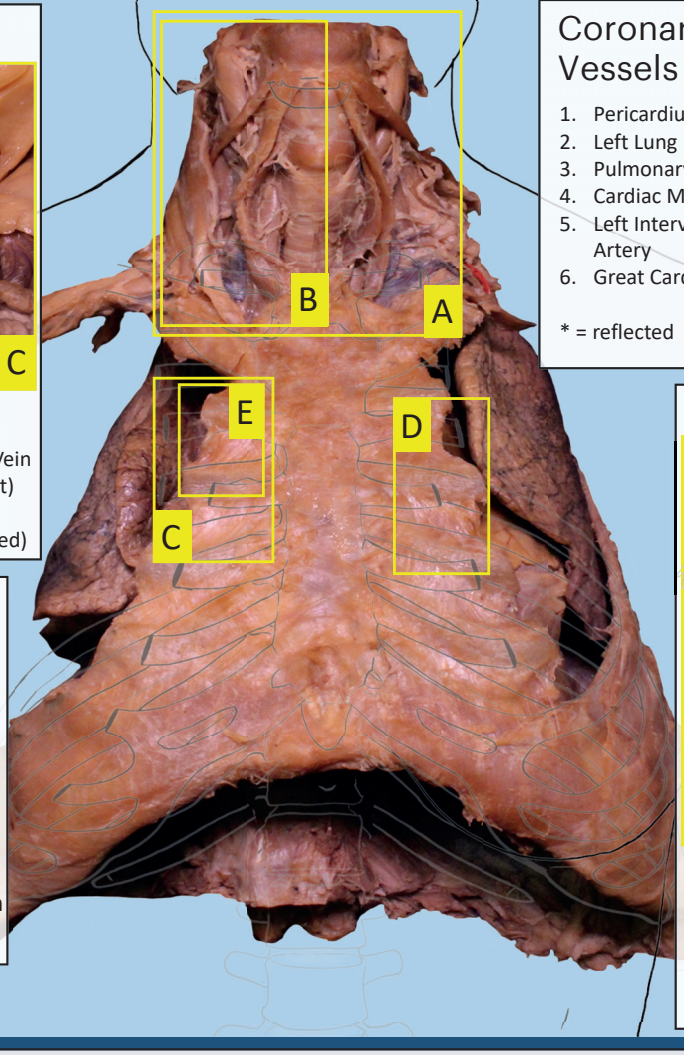


1. Vagus Nerve
2. Internal Jugular Vein
3. Carotid Bifurcation
4. Sternothyroid Muscle
5. Sternohyoid Muscle
6. Superior Laryngeal Nerve
7. Superior Laryngeal Artery
8. Superior Thyroid Artery
9. Superior Root of Ansa Cervicalis

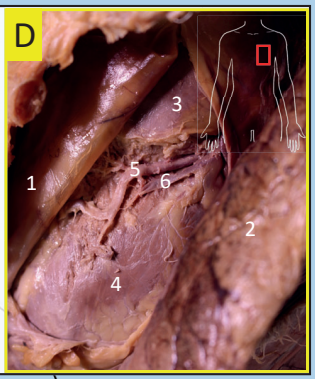
Hilum of the Right Lung



1. Vagus Nerve (Cut)
2. Trachea
3. Peribronchial Lymph Nodes (Necrotic)
4. Azygous Vein
5. Superior Vena Cava
6. Right Pulmonary Artery
7. Right Pulmonary Vein
8. Phrenic Nerve (Cut)
9. Right Lung
10. Pericardium (incised)



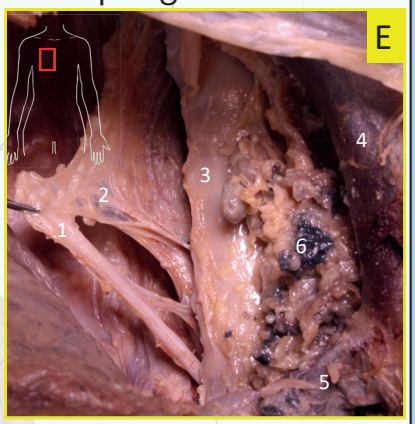
Coronary Vessels



1. Pericardium *
2. Left Lung *
3. Pulmonary Trunk
4. Cardiac Muscle
5. Left Interventricular Artery
6. Great Cardiac Vein

* = reflected

Oesophageal Plexus



1. Vagus Nerve (Cut)
2. Oesophageal plexus
3. Right Main Bronchus
4. Superior Vena Cava
5. Azygous Vein
6. Peribronchial Lymph nodes (necrotic)

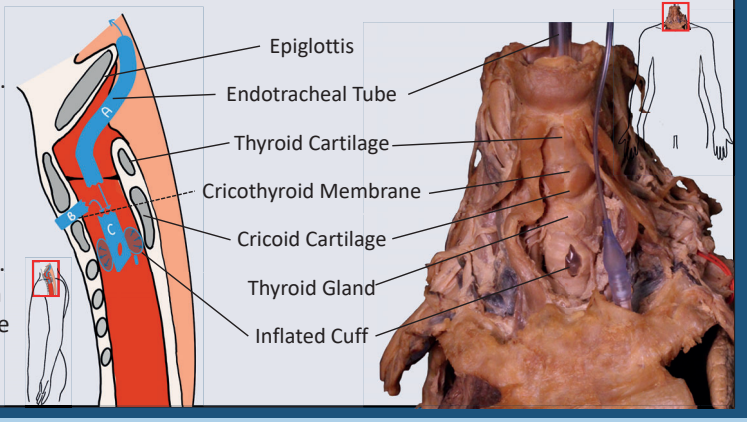
Surgical Considerations

The Recurrent Laryngeal Nerve (RLN) innervates all intrinsic laryngeal muscles except cricothyroid. It travels superiorly from its site of recurrence to behind the thyroid gland. Due to its highly variable location, it can be difficult to preserve during para/thyroidectomy. Perioperative injury can cause dysphonia presenting as hoarseness – as such, care should be taken while operating in this area.

Airway Management

Emergency Airway Access is required in situations of upper airway obstruction (e.g. anaphylaxis) or where physiological parameters indicate worsening respiratory distress e.g. acidosis, labored breathing, worsening respiratory rate.

Airway access in these situations can be achieved by reflecting the epiglottis and passing an endotracheal tube through the larynx (A-C). A balloon cuff is then inflated to ensure the tube stays in place.
A cricothyroidotomy (B-C) is an emergency procedure which should only be performed where intubation has failed and there is an immediate threat to life. The cricothyroid membrane is located via palpation of the depression between thyroid and cricoid cartilages which can be incised for airway access. Where the depression cannot be found, the trachea may be accessed directly approximately halfway between the cricoid cartilage and suprasternal notch.



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