

- **Lecture 2: Clinical anatomy of thoracic cage and cavity II**
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At the end of this session, the student should be able to:

- Identify and discuss clinical anatomy of mediastinum such as its deflection, inflammation, cyst and mediastinoscopy.
- Identify clinical anatomy of trachea and bronchi.
- Discuss clinical anatomy of lung, heart and thoracic vessels such as trauma, surgical

access to lungs, postural drainage, paracentesis, aortic trauma etc.

- Describe clinical anatomy of pericardium.
- Identify clinical anatomy of procedures like coronary angioplasty, bypass surgery, central venous access and indications of using superior vena cava to access inferior vena cava.

- Clinical anatomy of mediastinum
- Deflection of mediastinum
- Tension pneumothorax pleural pressure increases
- Leads to the collapse of lung
- Shifting of mediastinum
- Trachea and heart also shifted to other side.
- Hyperlucent hemithorax.
- Leads to breathlessness and shock
- Emergency needle thoracostomy should be performed on physical examination.

- followed by tube thoracostomy after radiological examination.
- Clinical anatomy of mediastinum
- **Mediastinitis**
 - ✓ Deep infection of neck
 - ✓ Penetrating wound of chest
- **Mediastinal tumor/cyst**
 - ✓ Usually left lung tumor involve mediastinal lymph nodes
 - ✓ Can compress left recurrent laryngeal nerve
 - ✓ Compression of superior vena cava
 - ✓ Phrenic nerve, trachea and Oesophagus may also compressed

- Clinical anatomy of mediastinum
- Mediastinoscopy
 - ✓ Diagnostic procedure
 - ✓ Used for collecting specimen of tracheobronchial nodes
 - ✓ Small incision above suprasternal notch

- ✓ Can explore superior mediastinum
- Clinical anatomy of trachea and bronchi
- Compression of trachea
- ✓ Unilateral or bilateral enlargement of thyroid
- ✓ Aortic arch aneurysm
- ☐ Pulsating aneurysm tug at trachea on each cardiac systole.
- ☐ Can be felt by palpating trachea in suprasternal notch.
- Clinical anatomy of trachea and bronchi
- Inhaled foreign bodies more commonly enter right bronchus.
- Right bronchus is more wider, shorter and vertical.
- Pass to middle lobar bronchi.
- **Tracheostomy**
- Emergency
- Foreign body, severe edema, head and neck trauma

- Cricothyroid ligament palpated and needle is inserted

- Clinical anatomy of trachea and bronchi

- Routine

- Vertical midline incision is made

- Strap muscles are retracted laterally

- Thyroid isthmus is retracted inferiorly

- Second ring is preferred

- Tube is inserted

- **Complications**

- ✓ Damage to

- ❖ Cricothyroid muscle and Vocal cords

- ❖ Recurrent laryngeal nerve

- ❖ Inferior thyroid vein

- ✓ Hemorrhage and esophageal injury

- Clinical anatomy of trachea and bronchi

- Bronchogenic carcinoma:

- ✓ Spread to tracheobronchial and bronchomediastinal nodes.
- ✓ May involve recurrent laryngeal nerve.
- ✓ Presents with hoarseness of voice.
- **Postural drainage:** non invasive technique used by physiotherapist to drain excessive secretion from bronchial segments.
- Gravity facilitates the process of drainage.
- Clinical anatomy of lungs
- Apex of the lung can be damaged by stab wound or bullet injury above the clavicle.
- A fractured rib can penetrate the lung causing pneumothorax.
- **Sub cutaneous emphysema:** air can enter subcutaneous tissue by passing into mediastinum and then reaches up to neck.
- Clinical anatomy of lungs
- Pleurisy of central part of diaphragm present referred pain over shoulder.

- Root value of phrenic nerve is C3, 4, 5 while supraclavicular nerve is C3 and C4.
- Surgical access to lung is undertaken by intercostal spaces.

- Clinical anatomy of vessels
- Aortic trauma
 - A sudden deceleration injury in RTA
 - Mostly likely occurs at three fixed points
 - ✓ Aortic valve
 - ✓ Ligamentum arteriosum
 - ✓ Point of entry behind the crura of diaphragm
- Aortic dissection

- Clinical anatomy of pericardium and heart
- **Cardiac tamponade**
 - ✓ Compression of heart
 - ✓ Filling of heart is altered in diastole
 - Causes
 - ✓ Pericarditis

- ✓ Stab or gun shot wounds
- **Paracentesis:**
 - ✓ Aspiration of pericardial fluid from pericardial cavity
 - ✓ Needle is passed to the left of xiphoid process in upward and backward direction at an angle of 45 degree.
- Clinical anatomy of heart
- **Comotio cordis**
 - ✓ Sudden death due to ventricular fibrillation
 - ✓ Blunt blow on anterior chest wall
 - ✓ More common in young sports person
 - ✓ Blow by base ball, elbow, fist
 - ✓ If blow occurs during upstroke of T wave, ventricular fibrillation will most likely happens
- **Cardiac pain**
 - ✓ Skin area is supplied by four intercostal nerve and intercostobrachial nerve (T2).
 - ✓ Intercostobrachial nerve communicates with medial cutaneous nerve of arm

- Clinical anatomy of heart
- Short left coronary artery is termed as left main stem vessel
- Anterior interventricular artery is termed as left anterior descending
- Posterior interventricular artery is termed as posterior descending artery.
- Clinical anatomy of procedures
- **Coronary angioplasty**
 - ✓ technique in which fine catheter is passed through femoral artery to access coronary arteries.
 - ✓ A wire is passed to cross the stenosis
 - ✓ A fine balloon is passed and inflated at the point of stenosis.
- **CABG**
 - ✓ Great saphenous vein is used as graft
 - ✓ Internal thoracic and radial arteries can also be used.
- Clinical anatomy of procedures

- **Central venous access**
- ✓ Axillary, subclavian and internal jugular veins are used.
- ✓ Tip of line lies in sup. Vena cava or right atrium.
- **Using superior vena cava to access inferior vena cava**
- ✓ Transjugular liver biopsy
- ✓ Transjugular intrahepatic portosystemic shunts
- ✓ Insertion of inferior vena cava filters to catch dislodged emboli from veins of lower limb and pelvis.
- Summary
- Clinical anatomy of mediastinum
- Clinical anatomy of trachea and bronchi
- Clinical anatomy of lungs
- Clinical anatomy of heart and pericardium
- Clinical anatomy of vessels
- Clinical anatomy of procedures

- References
- Snell RS. Clinical Anatomy by Regions. 9th edition, Lippincott Williams & Wilkins.
- Gray's anatomy for students, 2nd edition