THE MEDIASTINUM

The mediastinum is an anatomic division of the thorax extending from the diaphragm to the thoracic inlet. It is the site of many localized disorders and is involved in a number of systemic diseases.

Localized disorders that occur in this region include ☛primary tumors and ☛cysts as well as ☛infection, ☛hemorrhage, ☛emphysema, and ☛aneurysms.

Systemic diseases include ☛metastatic neoplasms and ☛granulomatous and ☛other inflammatory disorders. ☛Lesions that originate in the esophagus, great vessels, trachea, and heart may present as a mediastinal mass

ANATOMY

The mediastinum is defined by the following borders: the **thoracic inlet superiorly**, the **diaphragm inferiorly**, the **sternum anteriorly**, the **vertebral column posteriorly**, and the **parietal pleura laterally**. the mediastinum divided into three subdivisions:

- **The anterosuperior mediastinum** is anterior to the pericardium and the pericardial reflection over the great vessels. It contain the following:- ✶the thymus gland, ✶aortic arch and its branches, ✶great veins, ✶lymphatics, and ✶fatty areolar tissue.
- **The posterior mediastinum** is posterior to the pericardium and the pericardial reflection. It contain the following:- ✶the esophagus, ✶vagus nerves, ✶sympathetic nervous chain, ✶thoracic duct, ✶descending aorta, ✶azygous and hemiazygous systems, ✶paravertebral lymphatics, and ✶fatty areolar tissue
- **The middle mediastinum** is bordered anteriorly by the anterior pericardial reflection and posteriorly by the posterior pericardial reflection.it contain the following:- ✶the heart, ✶pericardium, ✶phrenic nerves, ✶tracheal bifurcation and ✶main bronchi, ✶hila of each lung, and ✶lymph nodes

MEDIASTINAL EMPHYSEMA

Air may enter the mediastinum from the ✶esophagus, ✶trachea, ✶bronchi, ✶lung, ✶neck, or ✶abdomen, producing mediastinal emphysema or pneumomediastinum. Injury to these structures can occur from **blunt or penetrating trauma**, **intraluminal injury**, such as during endoscopy, as well as **barotrauma**. Barotrauma may be caused by either blunt trauma or positive-pressure ventilation. Whereas dissection of air through the visceral pleura causes a pneumothorax, dissection of air along vascular structures into the hilum and mediastinum creates a pneumomediastinum.

Spontaneous pneumomediastinum is usually seen in patients with exacerbation of bronchospastic disease.

The clinical manifestations of this include **substernal chest pain**, which may radiate into the back, and **crepitation** in the region of the suprasternal notch, chest wall, and neck. With increasing pressure, the **air can dissect into the neck, face, chest, arms, abdomen, and retroperitoneum**. Frequently, pneumomediastinum and pneumothorax occur simultaneously.

Auscultation over the pericardium demonstrates a **characteristic crunching sound** that is accentuated during systole and is termed **Hamman's sign**.

The diagnosis of pneumomediastinum is confirmed by the presence of air in the mediastinum as visualized on the **chest films** or **computed tomographic (CT) scans.**

➔To evaluate the esophagus and large airways as potential sources, **contrast studies of the esophagus**, initially using a water-soluble contrast material, and **bronchoscopy** are best.

treatment

➔Spontaneous mediastinal emphysema and pneumomediastinum secondary to barotrauma usually respond to conservative measures that treat bronchospasm and minimize further barotrauma without sequelae. Surgical decompression is rarely necessary.

➔In patients with pneumomediastinum and pneumothorax, tube thoracostomy is indicated in the affected pleural space.

➔Patients with pneumomediastinum secondary to barotrauma continuing to require high levels of ventilator support may require bilateral tube thoracostomies to prevent the development of tension pneumothorax.

➔In patients who are distressed by the inability to open their eyes, 5-mm. incisions in the skin folds of the eyelids and neck can be made using local anesthesia. With gentle pressure on the surrounding soft tissue, sufficient air can be removed to provide symptomatic relief.

MEDIASTINITIS

Acute mediastinitis is a fulminant infectious process with high morbidity and mortality **characterized by rapid spread through the areolar planes of the mediastinum**.

Infection of the mediastinal space is a serious and potentially fatal process. **Etiologic factors responsible for the development of acute mediastinitis include**

➔**perforation of the esophagus** due to •instrumentation, •foreign bodies, •penetrating or, more rarely, blunt trauma,

➔**spontaneous esophageal disruption (Boerhaave's syndrome)**,

➔**leakage from an esophageal anastomosis**,

➔**tracheobronchial perforation**, and

➔**mediastinal extension from an infectious process** originating in the •pulmonary parenchyma, •pleura, •chest wall, •vertebrae, •great vessels, or •neck.

➔Mediastinitis occurs most often **after median sternotomy for open-heart cardiac operations**.. **The risk factors for the development of mediastinitis identified in a number of series include** ☛prolonged operation, ☛obesity, ☛lengthy cardiopulmonary bypass, ☛re-exploration for postoperative bleeding, ☛dehiscence, ☛external cardiac massage, ☛postoperative cardiogenic shock, and ☛the use of bilateral internal mammary arteries for coronary artery bypass grafting, especially in elderly patients or in patients with diabetes mellitus.

Mediastinitis is manifested clinically by fever, **tachycardia**, **leukocytosis**, and **pain** that may be localized to the chest, back, or neck, although in some patients the clinical course remains **indolent** for long periods.

In postoperative patients, **wound cellulitis** and **instability of the sternal closure** is often present. The clinical presentation is usually 3 days to 3 weeks after the operation, *although its development months later is not uncommon*.

When mediastinitis is secondary to esophageal perforation after instrumentation, the pain is most frequently localized to the neck because the most common site of perforation is at the level of the cricopharyngeal muscle. In these cases, **subcutaneous emphysema** is almost invariably present.

The lateral chest film is useful in evaluating for **air-fluid levels**, **abnormal soft tissue densities**, and **sternal dehiscence**. The **mediastinal contour is usually wide**, and **pleural effusion with or without pneumothorax** appears very frequently. **CT** may be useful when mediastinal gas is present, indicating the presence of gas-forming organisms or distinct abscess. It may also identify associated or contiguous infections such as an empyema, subphrenic abscess, or cervical soft tissue infection. **Water-soluble contrast studies of the esophagus** and **esophagoscopy** are important in evaluating a potential esophageal perforation or disruption. Similarly, **bronchoscopy** is the optimal procedure to evaluate potential tracheobronchial disruption.

Treatment of mediastinitis requires **correction of the inciting cause** and **aggressive supportive therapy**. Treatment must be early and aggressive because mortality is directly linked to length of time between injury and esophageal repair or diversion. Antibiotics and fluid resuscitation are begun immediately.

♦ After **obtaining cultures**, **appropriate antimicrobial coverage** should be initiated with modification after results of culture and sensitivity testing are available.

♦ **In patients with mediastinal infections in continuity or communication with empyema, subphrenic abscess, or neck abscess**, **drainage of the empyema with tube thoracostomy** or **percutaneous drainage of the abscess** in conjunction with appropriate antimicrobial therapy is frequently successful.

♦ **Mediastinitis associated with catheter sepsis** can often be treated with **removal of the catheter** and antimicrobial therapy.

♦ ***In patients who do not respond to these initial measures or when mediastinitis occurs from most other causes,*** **thorough débridement of necrotic and infected tissue is necessary in conjunction with surgical drainage**.

PATHOGENESIS OF INFECTION AFTER MEDIAN STERNOTOMY

the presence of fewer than 10^5 microorganisms per gram of tissue is compatible with successful wound closure. Levels higher than this result in wound breakdown, graft failure, and, as bacterial counts increase, invasive sepsis.

Predisposing Patient Factors.

- **prolonged ventilation**
- **female sex**
- **Obesity**
- **diabetes**
- **poor nutrition**
- **poor hemodynamics**
- **reoperation** .

Operating Factors.

- Patients with **congenital heart defects** appear to have a lower incidence of infection (less than 1%); those with **coronary artery bypass** have a higher infection rate, particularly when the internal mammary artery is used.
- **How the sternotomy is made**. The change from **Gigli (hand-driven) saws** to high-speed mechanical devices have reduced infection rates.
- **prolonged duration of the operation**
- **prolonged bypass (more than 3 hours)**.
- **The technique of immobilizing the sternum**

Physiologic Factors.

- **Low Flow**. Low-flow states may cause decreased local host resistance to bacteria. Similarly, the use of both internal mammary arteries decreases the blood supply to the sternum **and is accompanied by a fourfold to fivefold increase in mediastinitis**.
- **Hemorrhage**. All studies of infection support the fact that **bleeding and hematoma predispose to bacterial growth**. Data confirm that **operative bleeding** contributes to mediastinitis. More than 53% of patients with mediastinitis had **postoperative blood loss** of more than 1250 ml. **Reoperation** (either early or elective) is also a predisposing factor, Similarly, **postoperative cardiopulmonary resuscitation**, which clearly may disrupt the repair and cause bleeding, increases complication rates two to four times.

Other Factors.

- **Technical Errors**.
- **Distant Infection**.

MICROBIOLOGY

- **Staphylococcus aureus and S. epidermidis are the most common** and in a recent series accounted for 42% of infections.
- **Other gram-negative organisms and mixed infections** accounted for another 25% of infections. In some infections
- **no organisms** can be recovered.

DIAGNOSIS

prophylactic antibacterial agents, as part of the postoperative management, may delay the clinical appearance for 2 to 3 months; most mediastinitis will begin to be apparent between 4 days and 3 weeks.

Although **drainage of pus** through the wound is an obvious sign, suspicion should be heightened in a **patient whose pain begins to increase toward the end of the first week rather than decreasing** and whose **wound may become reddened and swollen**. A **spiking fever suggests the presence of an abscess**.

Aspiration of the mediastinum is a simple diagnostic maneuver that is of value when positive.

R**outine chest films are difficult to interpret**; **computed tomographic scans may be helpful**, particularly if gas-forming organisms are seen.

THERAPY

Nonoperative Therapy

Suppurative mediastinitis should be considered a surgical problem. Although nonsurgical supportive care to respiratory, vascular, and other systems is critical and although antibacterial agents given systemically are vital, they are strictly supportive and do not constitute definitive therapy, because few patients are treated nonsurgically. **Purulent drainage is an indication for surgery**.

Operative Therapy

The fundamental surgical approaches to any surgical infection include

❶ **Débridement**.

❷ **Irrigation**. The intraoperative irrigation **should be performed under pressure**.

❸ **Antibacterial Agents.**

❹ **Closure.** Closure of the wound involves two steps: **(1) rigid fixation of the sternum whenever possible** and **(2) adequate soft tissue coverage**. The timing of closure is dependent on obtaining bacterial control of the wound.

Chronic Mediastinitis

Although **chronic mediastinitis** may be due to an **indolent bacterial infection**, more frequently chronic infections are **granulomatous processes that follow tuberculosis or mycotic infections**. Active infection requires treatment with antituberculosis or antifungal agents. The process is likely to remain clinically silent unless it progresses to produce obstruction of adjacent structures. Rarely, **surgical decompression**, **excision**, **or bypass** is necessary **in addition to medical therapy** to alleviate obstructive symptoms.

HEMORRHAGE

Mediastinal hemorrhage is most frequently caused by ✶blunt or penetrating trauma, ✶thoracic aortic dissection, ✶rupture of aortic aneurysm, or ✶surgical procedures within the thorax. ✶ Spontaneous mediastinal hemorrhage.

Spontaneous mediastinal hemorrhage is a recognized entity with predisposing factors related to the following:

(1) **complication of a mediastinal mass**, of which •thymoma, •malignant germ cell tumor, •parathyroid adenoma, •retrosternal thyroid, and •teratoma are the most common;

(2) **sudden sustained hypertension**;

(3) **altered hemostasis** due to •anticoagulant therapy, •thrombolytic therapy, •uremia, •hepatic insufficiency, or •hemophilia; and

(4) **transient, sharp increases in intrathoracic pressure**, which occur during •coughing or •vomiting,

The pathophysiology of this disorder is thought to be associated with rupture of small mediastinal vessels. Usually, the **clinical course is benign** with resolution of symptoms without long-term sequelae.

The clinical presentation . **Retrosternal pain** radiating to the back or neck is common. With increased accumulation of blood in the mediastinum, **signs and symptoms related to compression of mediastinal structures** (primarily the great veins) develop, including dyspnea, venous distention, cyanosis, and cervical ecchymosis due to blood dissecting into soft tissue planes. Sufficient accumulation of blood causes **mediastinal tamponade** manifested by tachycardia, hypotension, reduced urinary output, equalization of right- and left-sided cardiac filling pressures, and diastolic collapse of the right ventricle.

Diagnostic measures include **chest films**, which may indicate →superior mediastinal widening, →loss of the normal aortic contour, and →soft tissue density in the anterosuperior mediastinum; **echocardiography**; and **CT scanning**, which may better characterize a mass and its relationship to vascular structures, particularly if a false lumen is present. **Arteriography** may be useful in localizing the site of bleeding or intimal disruption.

Therapy is directed toward evacuation of existing clot and repairing the underlying process. In patients who have suffered penetrating trauma with associated profound hypotension, emergency thoracotomy or sternotomy is indicated without initial arteriography.

SUPERIOR VENA CAVA OBSTRUCTION

A number of benign and malignant processes may cause obstruction of the superior vena cava, leading to **superior vena caval syndrome**.

The pathophysiology of the syndrome involves the **increased pressure in the venous system draining into the superior vena cava**, producing the **characteristic features of the syndrome**, which include **edema of the head, neck, and upper extremities; distended neck veins with dilated collateral veins over the upper extremities and torso; cyanosis; headache; and confusion.**

Superior vena caval obstruction may arise from •compression, •invasion, or •thrombosis. **The cause may be the primary tumor or mass or is often due to paratracheal lymph node metastases. Whereas in adults the most frequent cause is a malignant neoplasm, usually a bronchogenic carcinoma, in children the syndrome is most common after cardiac surgical procedures, particularly atrial level repairs for transposition of the great vessels.**

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Diagnosis

- **Contrast medium–enhanced CT scanning** or **magnetic resonance imaging (MRI)** is usually adequate to establish the diagnosis
- **venous angiography** is rarely required to establish the diagnosis, it does provide more accurate anatomic detail regarding the site of obstruction and collateral development, which is necessary if surgical bypass is required.
- **Percutaneous needle biopsy** is usually the initial diagnostic modality used to establish a histologic diagnosis
- **Open biopsy** in patients able to tolerate anesthesia may be necessary to establish a diagnosis. However, these patients are at an increased risk for cardiorespiratory compromise during general anesthesia.

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Treatment

The most useful types of therapy include ➔ **percutaneous stenting**, ➔**irradiation**, ➔**corticosteroid therapy**, ➔**multiagent chemotherapy** and. ➔ **anticoagulant or fibrinolytic therapy.** The optimal therapeutic regimen is dependent on the histologic diagnosis.

PRIMARY NEOPLASMS

Epidemiology and Incidence

Secondary involvement from direct infiltration of an intrathoracic primary or metastatic disease from elsewhere occurs more frequently than primary mediastinal tumors.

Regarding primary mediastinal masses, Lesions of the posterior mediastinum dominate pediatric series, and masses in the anterior mediastinum are more common in adults.

If all mediastinal lesions are considered in a ***pediatric series***, neurogenic tumors that arise in the posterior mediastinum are most common. Most are neuroblastomas, a malignant neoplasm most common among children 3 years of age and younger. The second most common malignant neoplasm in pediatric age group is lymphoma, which is usually found in anterior mediastinum, these tumors are more common in adolescent years. Germ cell tumors are the second most common anterior mediastinal mass in children, most of them being benign teratomas.

In ***adult series***, anterior compartment lesions predominate with thymic neoplasm leading the list, adult series are comprised of fewer posterior lesions. Thymoma is the most common neoplasm of the thymus and may be associated with MG, lymphomas are the second and the primary germ cell tumors are third.

The mediastinum may be involved by metastatic tumor mimicking a primary mediastinal lesion. In elderly people, this is the most common cause of mediastinal lymphadenopathy.

type	percentage
Lymphoma	41
Germ cell tumor	23
Thymic	21
mesenchymal	15

Anterior med. Masses in children

type	percentage
Thymic	46
Lymphoma	24
Germ cell tumor	15
endocrine	15

Anterior med. masses in adults

Anterior Mediastinal Masses

Thymoma

This is the most common mediastinal tumor accounting for 25 per cent of the total. These are tumors of the thymic epithelial cells of Hassall's corpuscles and are sited in the anterior and superior compartments. They generally occur after childhood and present as lobulated, occasionally calcified, masses in the anterior mediastinum. They may appear encapsulated and are often associated with the autoimmune diseases like myasthenia gravis, red cell aplasia and hypoglobulinemia. The tumors vary in their behavior from completely benign to aggressively invasive. The only reliable indicator of malignancy is capsular invasion. Diagnosis and treatment are best achieved by complete thymectomy, but radiotherapy may be the only treatment option if the lesion is advanced.

Rarer still is the **thymic carcinoma**. This is not associated with myasthenia and resembles SCC or an undifferentiated large cell tumor. Surgical excision is the treatment of choice when there is no evidence of widespread dissemination. The prognosis is generally poor in spite of combination treatment of excision, radiotherapy and cytotoxic therapy**.**

Lymphoma

Mediastinal lymphoma usually presents as a component of more diffuse systemic process, however; primary mediastinal lymphoma occurs approximately in 10% of time. Lymphoma is a common cause of a mediastinal mass lesion, particularly the anterior mediastinum, leading to obstruction of the superior vena cava. Lymphomas arise from the thymic lymph tissue or the lymph nodes of the mediastinum. They can be classified into Hodgkin's and non-Hodgkin's types. Hodgkin's lymphomas presenting in the thymus tend to be localized and usually have favourable histology and a favourable response to treatment. Non-Hodgkin's lymphomas are usually high grade and are more common in young to middle-aged females. A tissue diagnosis is essential so that the appropriate treatment can be planned. The overall prognosis in non-Hodgkin's lymphomas is poor.

Lymphoma is better to be treated non surgically, but still a tissue diagnosis is essential in order to plan an appropriate treatment.

Germ Cell Tumors

Primary germ cell tumors that arise in extragonadal sites are uncommon in people of all ages. nevertheless; it is important to exclude a gonadal primary lesion with a physical exam and scrotal US whenever a mediastinal germ cell tumor is diagnosed. Germ cell tumors are usually found in the anterior mediastinum. They tend to occur in young adults and 75 % are **benign and cystic** (benign teratomas, dermoid cysts). They contain elements from all three cell types (mesoderm, endoderm and ectoderm) and are best treated by surgical excision. **Malignancy** is suspected if elevated levels of serum alpha-fetoprotein, human chorionic gonadotrophin and carcinoembryonic antigen are detected. They are classified into:

- **Seminoma:** any evidence of tumor below the diaphragm may suggest systemic or advanced disease.

Elevation of βHCG in serum.
Treatment is usually non surgical.

- **Nonseminomas:** elevation of both AFP and βHCG in serum.

Treatment is usually non surgical.

Mesenchymal Tumors

A small number of mesenchymal tumors occurs within the mediastinum and approximately half are malignant. Lipomas are common in the anterior mediastinum, whereas the malignant form, liposarcoma, tends to occur posteriorly. Fibroma, Fibrosarcoma and mesothelioma may also occur.

Endocrine

Ectopic thyroid tissue (and parathyroid) may be found in the anterior mediastinum. Neoplasia and hyperplasia may occur but these are uncommon. More often the tumor is merely a mediastinal extension of a thyroid lesion.

Middle Mediastinal Masses

They are mostly cystic lesions, whether acquired or congenital, some are very rare, may be asymptomatic, or produce symptoms due to pressure effect, infection, or perforation, usually diagnosed by radiological methods, and treatment options range from observation, aspiration, to excision depending on symptoms, nature and diagnosis of such cysts, and on possible complications (infection or malignant transformation).

posterior Mediastinal Masses

Neurogenic Tumors

These may be derived from the sympathetic nervous system or the peripheral nerves or peripheral ganglia and are more prevalent in the posterior mediastinum. They may be asymptomatic, or cause symptoms related to pressure effects on neighboring structures or may be hormonally active giving rise to related symptoms.
Treatment is by complete surgical excision

A) Tumors of the autonomic nervous system:

are more common in young patients less than 10 years of age, and the cells of origin are the sympathetic ganglion cells, a spectrum exist from benign to malignant cells. .
Ganglioneuroma: It is benign encapsulated tumor, and generally has a good prognosis.
Ganglioneuroblastoma: It is mixed encapsulated tumor, This tumor has an intermediate prognosis**.**
Neuroblastoma: It is malignant and rarely have capsule, It metastasizes widely and has a poor prognosis.

B) nerve sheath tumors:

typically are asymptomatic or cause pressure symptoms,
Adults are more prone to develop **Schwannomas (neurilemmoma)** and **neurofibromas**. these are benign tumors.

They have a wide range of presentations and behaviors. Multiple neurofibromas may be part of a familial syndrome (Von Recklinghausen's disease, neurofibromatosis). Tumors in the paravertebral gutter may have a component within the intervertebral canal (a so-called dumb-bell' tumor).
Neurofibrosarcoma and **malignant schwannoma** are malignant, they are friable with more tendency to produce symptoms at presentation.

C) paraganglionic tumors:
Chemodectoma: tumor of the aortic body, resection is the rule if the tumor is not locally invasive.
Phaeochromocytomas: These arise from the aorticosympathetic paragangliomas and produce the characteristic endocrine syndrome.

Symptoms and Signs of mediastinal masses in general

- May be asymptomatic, and symptoms may be chest pain, dyspnea (due to the bulk of the tumor compressing, or invading the trachea, pleural effusion, or pericardial effusion), and cough. other less common symptoms are dysphagia, hoarseness, Horner's syndrome, palpitation, malaise, weakness, and weight loss.
- Signs are lymphadenopathy, distended neck veins, plethora and hyper-reflexia.
- Neurogenic lesions may encroach on the spinal canal giving signs of cord compression.
- Systemic syndromes are the hallmark of endocrine process which include hyper or hypothyroidism, paroxysmal malignant hypertension, and MG.
- Rare mesenchymal lesions such as mesothelioma and fibrofarcoma are known to produce an insulin like substance , leading to hypoglycemia.
- Most asymptomatic mediastinal masses discovered by routine chest radiography will be benign. In contrast, masses presenting with symptoms, in particular pain, are much more likely to be malignant.
- Superior vena caval obstruction
- Tracheal and esophageal compression:-This may be extrinsic or from mural invasion; symptoms include dysphagia, dyspnea and occasionally stridor. Radiotherapy or intraluminal stenting may provide some relief.
- Neural invasion:- A left-sided hilar lesion may infiltrate the recurrent laryngeal nerve and paralyze the vocal cords leading to hoarseness and a bovine cough. Paralysis of the phrenic nerve causes a raised hemidiaphragm on the affected side and indicates irresectabiliry. Horner's syndrome is a result of invasion of the sympathetic chain superiorly.

- Pericardial invasion -: Direct invasion may cause changes similar to pericarditis with arrhythmias and ECG changes. Chronic tamponade may occur from the slow accumulation of fluid in the pericardium.

Investigation

Investigation of a mediastinal lesion follows the same pattern as investigation for pulmonary lesions with more emphasis on radiology, mediastinotomy and mediastinoscopy.

- **Blood work**:- B HCG and AFP are used as adjunctive measures in the diagnosis of anterior masses, and for follow up treatment.
- **Conventional radiography:-** CXR, barium esophagography, myelography.
- **CT scan:-** As a staging modality.
- **MRI:-** It is better than CT in detecting soft tissue and vascular extension of the tumor, and it has become the diagnostic modality of choice for evaluation of neurogenic tumors, suspected vascular anomalies, and processes that involve aortic arch and it's branches.
- **Biopsy:-** *FNA*: less useful here because of the mass being central, or because the diagnosis of many tumors need large biopsy tissue to be precise.
  Mediastinoscopy and thoracoscopy (excellent approach for inaccessible posterior masses).
  Sternotomy or thoracotomy.

Treatment

If a ***resection*** is planned, the best approach to the anterior and superior mediastinum is through a median sternotomy. The posterior mediastinum can be reached through a postero-lateral thoracotomy at the appropriate level. Dumbbell tumors are approached intraspinally, then by thoracotomy(in same cession).

Chemotherapy and radiotherapy are used for unresectable tumors, or to control local pressure or invasive symptoms.

Primary Cysts

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It **comprise 20% of the mediastinal masses** in the collected series. Most are located in the middle compartment. More than 75% of patients are asymptomatic, and These cysts can be:-

Bronchogenic cysts are the most common primary cysts of the mediastinum, They originate as sequestrations from the ventral foregut, the antecedent of the tracheobronchial tree. Two thirds of patients with bronchogenic cysts are asymptomatic. **In infants**, these cysts may cause severe respiratory compromise by compressing the trachea or the bronchus; compression of the bronchus may cause bronchial stenosis and recurrent pneumonitis.

CT & ***barium swallow*** *may be useful in assessing the* condition

. **Serious complications** are less common and **include** ☛hemodynamic compromise, ☛airway obstruction, ☛pulmonary artery obstruction, ☛hemoptysis and ☛malignant degeneration.

Surgical excision is recommended in all patients.

Pericardial cysts **are the second most frequently encountered cysts within the mediastinum**. These cysts **classically occur in the pericardiophrenic angles**. Pericardial cysts may or may not have a communication with the pericardium. They are usually asymptomatic. ***CT*** usually diagnostic
excision of pericardial cysts is indicated primarily for diagnosis and to differentiate these cysts from malignant lesions.

Enteric cysts (duplication cysts) **arise from the posterior division of the primitive foregut**, which develops into the upper division of the gastrointestinal tract. These cysts are found less frequently than bronchogenic or pericardial cysts. They are located in the posterior mediastinum, usually adjacent to the esophagus.

When gastric mucosa is present, peptic ulceration with perforation into the esophageal or bronchial lumens may occur, producing *hemoptysis* or *hematemesis*. Erosion into the lung parenchyma may cause hemorrhage and lead to lung abscess formation**.**

CT and myelography are useful in diagnosis

Treatment is **surgical excision**

Thymic cysts are generally asymptomatic. Simple cysts are of no consequences; however the occasional cystic neoplasms must be ruled out. Cystic components are occasionally seen in patients with Thymoma and Hodgkin`s disease.