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RESEARCH ARTICLE

CASE 2016, A 29 YEAR OLD MAN WITH ABDOMINAL PAIN 1 WEEK AFTER TEETH EXTRACTION.

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Abstract

History and Examination:-

Mr. B a 29 year old from India, previously healthy presented with abdominal pain for 2 days located in the upper abdomen. The pain started suddenly as the patient was sleeping; pain intensity increases as he takes a deep breath. The pain has no radiation and was very severe described being 9/10. Mr. B was no able to sleep due to the severity of the pain. Pain does not change with movement yet increases when drinks water. No associated vomiting, nausea, bowel habit changes nor cough or urinary symptoms.

Recently as in less than a week from presentation to the Causality the patient had a dental procedure as he got 2 teeth extracted in the left side inferior. This had affected in food intake as it caused severe pain whist eating. He was given Ibuprofen and Dalacin C after the procedure. Mr. B does not smoke nor does he consume alcohol. He is otherwise healthy and works as a domestic worker.

On Examination, Vital signs were as follow Heart Rate of 80 bpm respiratory rate of 40 breaths per minutes and a Temperature of 37 degrees and blood pressure of 100/80 mmHg. Chest Examination shows a tachypnic patient with normal breathing and equal bilateral air entry yet crackles were audible. Cardiac Examination revealed a normal first and second heart sounds with no audible murmur. Abdominal examination shows no scars no skin changes; soft and lax abdomen with tenderness over the epigastric and right upper quadrant areas, no murphy's sign nor signs of ascites. Rest of examination is normal. The patient was admitted as a case of abdominal pain for investigation to the surgical ward.

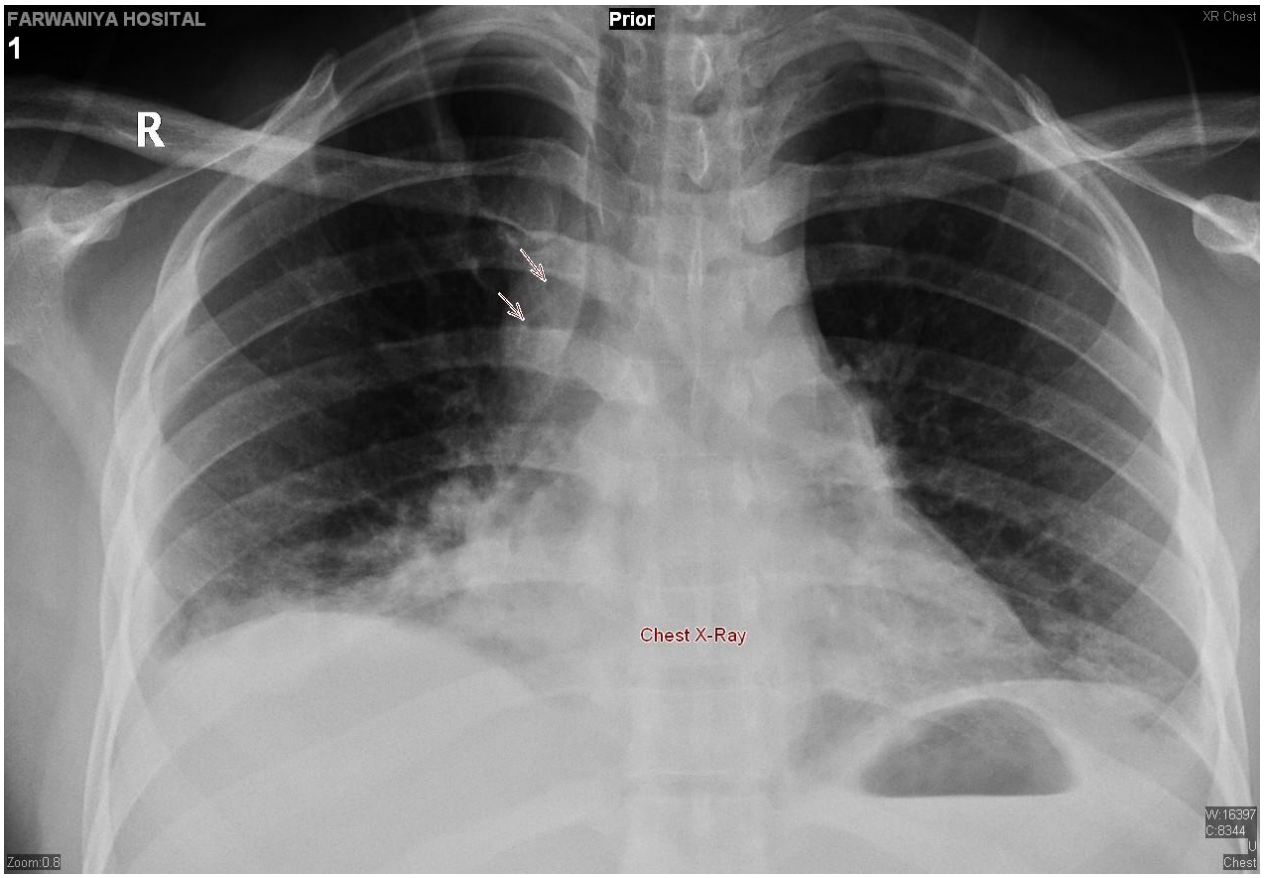

Figure 1:- Chest X ray: Widened mediastinum with minute air lucency noted in the right side

Labs, Imaging and Follow Up:-

Labs:-

WBC	4.1	3.7-11
Neutrophils	77.4 HIGH	41-73
Lymphocytes	17 LOW	19.4-44.9
Hemoglobin	121 LOW	130-170
MCV	80 LOW	82-98
Platelets	185	150-440
CRP	395 HIGH	0-8
PCT	6.19 HIGH	0.02-0.046
INR	1.56	
Urea	11.3	2.5-6.4
Creatinine	157 HIGH	74-115
Uric acid	283	150-450
Sodium	136	136-146
Potassium	3.6	3.5-5.2
Alkaline phosphatase	46	53-128
Alt	43	10-60
Ast	53	10-42
T bilirubin	35	3-20
D bilirubin	20	0-5
Lipase	15	13-60
LDH	204 HIGH	100-190

Cardiac Enzymes	Result	Normal Values
CK MB Plasma	12 – 20 – 2.6	(0.6-6.3)
CK Plasma	765 – 768 – 386	(25-270)
Troponin I	0.65 – 0.65 – 0.15	(0-0.03)

Culture and Sensitivity		
24/4/2016	Pleural Fluid Culture	Negative
2/5/2016	Wound Culture	Negative
2/5/2016	Urine Culture	Negative
3/5/2016	Blood Culture	Negative

Imaging:-

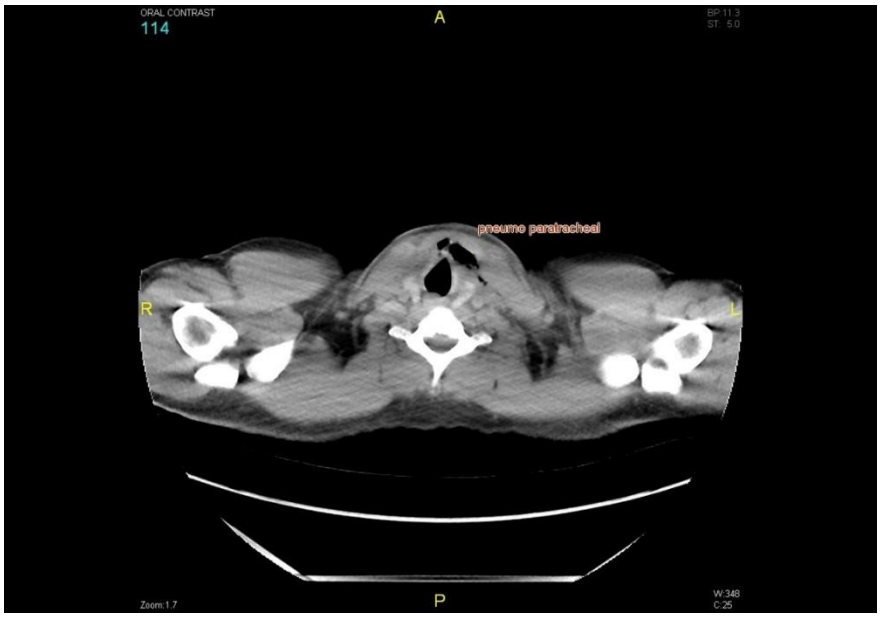

Figure 2:- Axial CT Neck: Pneumothroachea. Diffuse stranding and smudging of the mediastinal fat planes with multiple small gas foci noted in the posterior and right para-tracheal regions

Figure 3:- Sagittal CT Chest and Lower Neck: Pneumomediastinum. Multiple failry defined sheets and foci of gas density are seen extending along different saces of the neck with smudging of the fat planes more extensive on the left side.

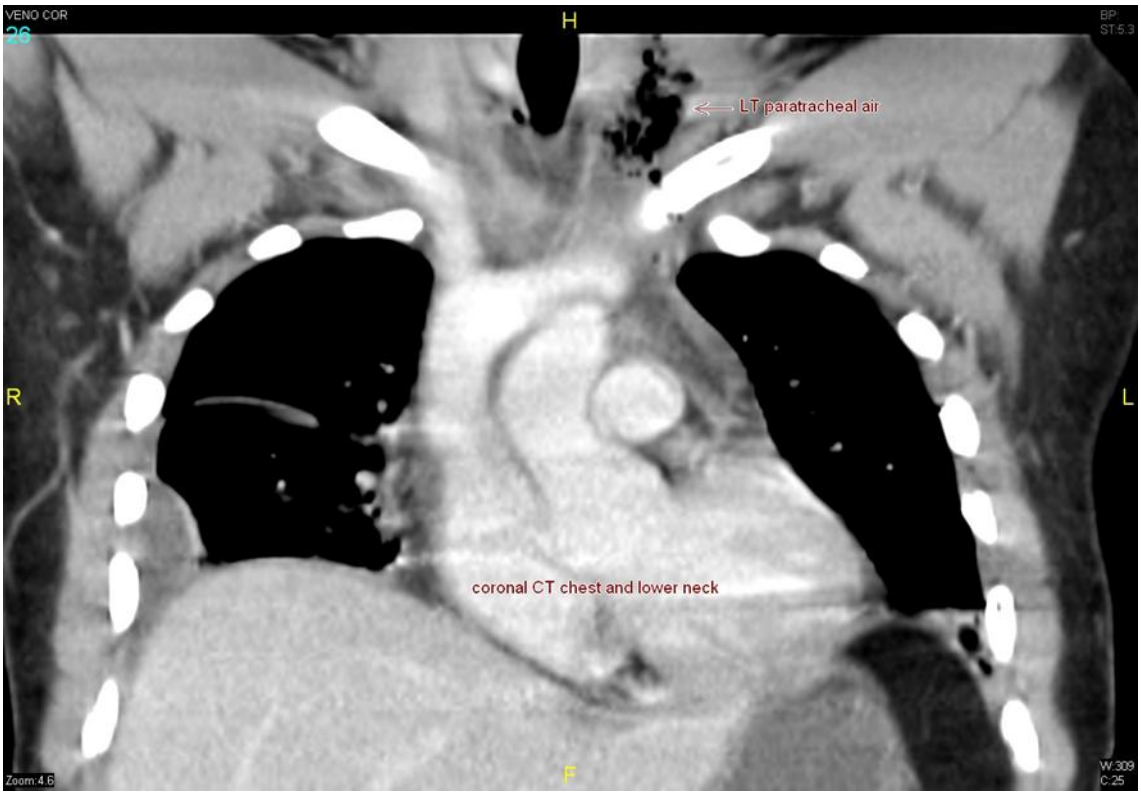

Figure 4:-Coronal CT Chest and Neck: Left paratracheal air. Moderate partially encysted right size pleural effusion with extension to the major fissure with consolidation in right lower lobe.

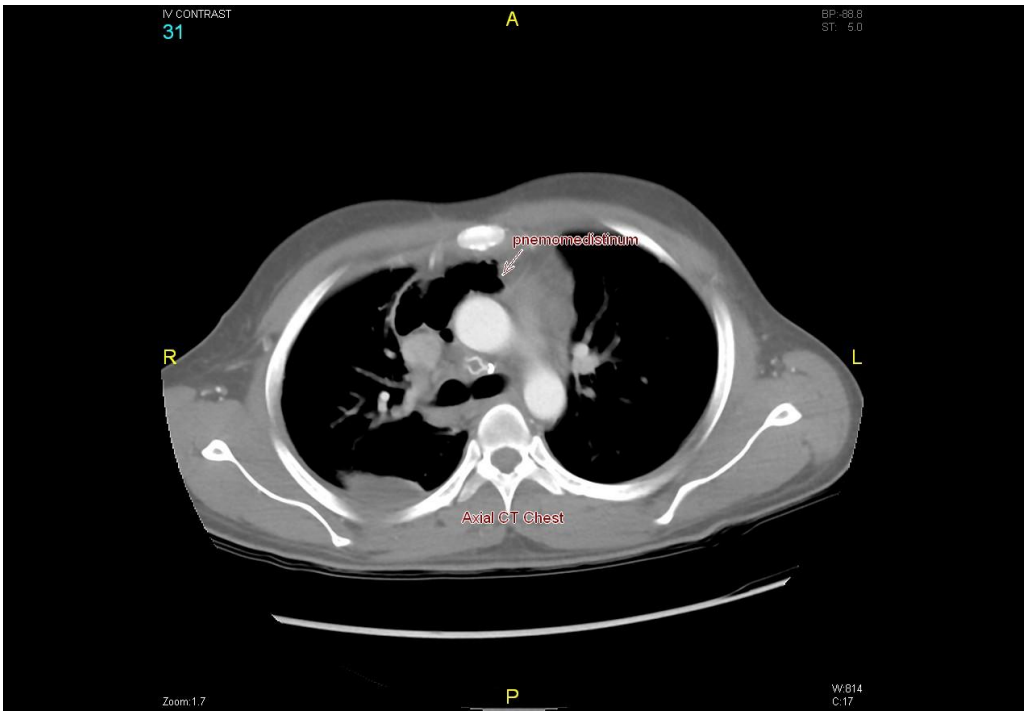

Figure 5:-Axial CT Chest: Showing Pneumomediastinum.

Figure 6:-Coronal CT Chest: Shows Bilateral Pneumomediastinum.

Follow up:-

As the patient was shifted to the ward he developed tachypnea, seen by ICU for the tachypnea. Patient is conscious and oriented and responding to command placed under oxygen therapy 5 L oxygen mask and waiting for result of CT Chest and Abdomen. Seen by Maxillofacial, No intervention needed and only to continue Clindamycin and Dental Clinic. Nephrology was consulted for the high creatinine and before the patient undergoes the CT Chest and Abdomen. Creatinine was 185 with no underlying baseline. Patient prior to the CT has volume depletion which is the current reason for Acute Kidney Injury. Patient has active serious illness Lactate of 5.8 High. Sepsis due to the dental abscess, Therefore to start him on IV fluids Normal Saline 80ml/hour 12 hours with accurate fluid charts. N-Acetylcysteine 1.2 grams oral three times daily before and 2 days after the Contrast. To follow up RFT.

Upon CT images collection in the mediastinum pleural and necrotizing fasciitis of the neck. Underwent neck drainage mediastinal anterior and posterior drainage, chest tube was inserted in the right side. Neck incision was made anterior to the sternocleidomastoid from the level of the hyoid to the sternal notch the mediastinum was entered anteriorly and posteriorly pus drained from the mediastinal collection. And from the neck corrugated drain inserted in the posterior and anterior mediastinum right side of the neck reached from the left and drained with another drain chest tube inserted in the pleural cavity irrigation was made with saline and vancomycin, and skin closure by prolene 2. Patient had 3 drains and required daily dressing and started a course of antibiotics.

Follow up Next Day, still complains of difficulty breathing and pleuritic chest pain in addition to abdominal pain which was in the epigastric and right upper quadrant and increased with inspiration. No vomiting no nausea no bowel habit changes no cough. Vital Signs Temperature 38.1 Heart Rate of 120 bpm and RR of 33 SpO2% 88% on Room Air. Chest with decreased air entry bilaterally and crepitation. Abdomen with right upper quadrant and epigastric tenderness. Patient shifted to ICU with a differential of sepsis, septic shock , AKI postoperative intubated and sedated. Seen by Cardiology because of ECG changes Sinus rhythm with early repolarization change in inferior leads with ST elevation early repolarization in inferior leads no treatment need due to sepsis. Followed up next day and that was as follows diffuse ST elevation anterior and inferior leads coincide with pericarditis previous ECG shows more prominent ST elevation in all leads. Troponin maximum was 0.58 differential diagnosis of sepsis, pneumonia and pericarditis ibuprofen 400mg TDS

From the 12/4/2016 till 3/5/2016 , then ICD and pigtail removed under aseptic technique 2 corrugated drains removed from the neck and wound left open, daily dressing normal saline and vancomycin and delayed primary closure. Shifted to general surgical ward patient kept improving gradually and completed antibiotics course Meropenem 23 days Levofloxacin andLinezolid 11 days.

Labs Before discharge

WBC	11	3.7-11
Neutrophils	73	41-73
lymphocytes	13	19-44
Hemoglobin	98	130-170
MCV	84	82-98
Platelets	221	150-440
Urea	2.3	2.5-6.4
Creatinine	48	74-115
Sodium	133	136-146
Potassium	3.6	3.5-5.2
Alkaline Phosphatase	60	53-128
ALT	38	10-60
AST	18	10-42
GGT	32	12-64
CRP	39 HIGH	
Lactate	0.77	
PCT	0.067 HIGH	

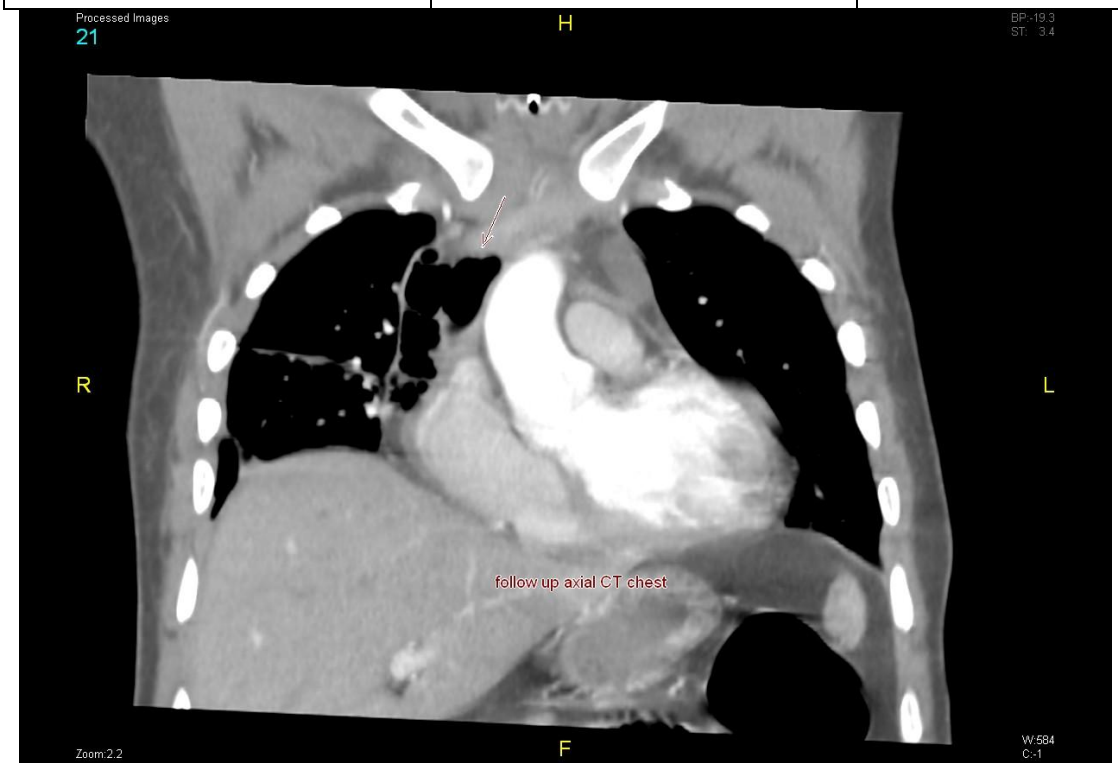

Figure 7:-Axial CT Chest follow up. Post chest tube and drain. resolution of the left side pleural effusin and reduction in the riht sided pleural effusion. significant amount of air dissecting the fat planes in mediastinum.

3 weeks after discharge patient is doing well overall yet complained of a productive cough whitish sputum no other symptoms, patient lost 18 kg since admission. From 70 kg till 52 kg during follow up

Differential diagnosis:-

Diagnosis of DNM must be suspected clinically with the occurrence of respiratory symptoms such as chest pain, dyspnea, or respiratory distress. Chest x-ray films usually demonstrate widening of the superior mediastinal shadow, a pneumomediastinum, or an abscess that obliterates the retrosternal or retrocardiac clarity, but often these findings appear too late in the course of the disease. (2) Delay of diagnosis and delayed or inappropriate drainage of the mediastinum are the main causes for the high mortality in this life-threatening condition. (3)

DNM mimicking acute ST segment elevation myocardial infarction has rarely been reported. With our patient's presentation of dull chest pain, elevated troponin-I level and ECG change, acute myocardial infarction was initially impressed, but clinical presentation and persistent ST-T elevation without evolution made this diagnosis doubtful. These findings could be explained by pericardial involvement of DNM. Hoarseness and dysphonia indicated Para tracheal region or recurrent laryngeal nerve involvement. (3)

The inflammation associated with DNM may involve the heart, which produces acute changes in the electrocardiogram (ECG). As a result, the ECG may mimic pericarditis. (1) Acute pericarditis is a common disorder caused by inflammation of the year pericardium and can occur as an isolated entity or as a manifestation of an underlying systemic disease. Although no criteria for the diagnosis of acute pericarditis have been established, prior studies6-8 have suggested that at least 2 of the following 4 criteria should be present:

(1) characteristic chest pain, (2) pericardial friction rub, (3) suggestive electrocardiographic
(ECG) changes, and (4) new or worsening pericardial effusion. (5)

Since clinical features depend upon the location of the infection, descending mediastinitis presents as a wide clinical spectrum, ranging from subacute forms to devastating forms that require immediate intensive care. Chills, high-fever, tachycardia, dyspnea and nonproductive cough are the main symptoms and the most common ones associated with mediastinitis. When the upper mediastinum is involved, retrosternal pain that radiates upwards into the neck may be present. On the other hand, when the posterior compartment of the inferior mediastinum is affected, pain originates between the scapulae and radiates around the chest. These symptoms usually appear 24-48 hours after the stimulation process. At more advanced stages, the patient may present with sepsis and hypotension. (6) Sepsis is among the most common reasons for admission to ICUs throughout the world, and it is believed to be the third most common cause of death in the United States. The early management of patients with severe sepsis and septic shock centers on the administration of antibiotics, IV fluids, and vasoactive agents, followed by source control. (7)

Necrotizing mediastinintis:-

Mediastinitis is an inflammation of the connective tissue that involves mediastinal structures and fills interpleural spaces.[1, 2] It can be secondary to infectious or non-infectious causes and can be acute or chronic. it is considered a life-threatening condition if not diagnosed early or if treated inadequately in acute onset.[1] most of the cases are related to cardiovascular operations.[3, 4] there are other different causes of medistinitis such as esophageal perforation, tracheobronchial perforation, mediastinal extension of pulmonary infections or mediastinal extension of head and neck infections.[5, 6]. Descending mediastinitis is called after the condition when it is secondary to infectious origin located in the cervical or oral region.[2]

The median age of onset is 36 years and 86% of the patients are men. it mainly affects young adults [13]. the most common cause of descending mediastinitis is Odontogenic infection which accounts for 40-60% of the cases.[8, 14,12] Based on radiological findings, descending medistinitis can be classified to type I: where infection is located in the superior mediastinal space above tracheal bifurcation, and type II (diffuse type): where infection is located in either inferior anterior or inferior posterior medistinum.[18]In the United States Most of the cases occur following cardiovascular surgery and in this setting risk factors include: Emergency surgery, External cardiac compression, Obesity, Postoperative shock, Sternal wound dehiscence, Progressive odontogenic infection andDescending infection following surgery of the head and neck; as the case in our patient, great vessels, or vertebrae [33,34,35] The causes according to percentages are as following: odontogic infection. (40-60%), retropharyngeal abscess (14%),

peritonsillar abscess (11%), cervical lymphadenitis, clavicular, osteomyelitis, traumatic endotracheal intubation (7%), external trauma (5%), Iv drug abuse, parotitis, thyroditis.[12,13]

With Regards to the microorganisms involved may be aerobes or anaerobes. The type most commonly isolated is beta-hemolytic oral Streptococcus specifically secondary to odontogenic infections.[2,8] Other organisms commonly found include Prevotella, Peptostreptococcus, Fusobacterium, Veillonella, Actinomyces, Bacterioides.[22]gram-positive cocci responsible for most cases that occur after cardiac surgery specifically Staphylococcus aureus. and Staphylococcus epidermidis accounting for 70-80% of cases.[33,36]

Descending medistinitis can present commonly with the following symptoms: Chills, high-fever, tachycardia, dyspnea and non-productive cough.[1,8] it also can be presented with retrosternal chest pain radiating to the neck When the upper mediastinum is involved.[1]According to Estrera et al. ,the diagnostic criteria for descending mediastinitis, are: 1) evidence of oropharyngeal infection; 2) radiographic characteristics of mediastinitis; 3) intraoperative or postmortem documentation of infection; and 4) establishment of a relationship between the oropharyngeal process and mediastinitis.[24]

Diagnosis:-

Laboratory Studies:-

A complete blood count (CBC) shows leukocytosis, decreased hematocrit value (if bleeding occurred), increased platelet count in the early stages of sepsis, and disseminated intravascular coagulation (DIC). blood cultures should be obtained as clinically indicated in sepsis to confirm bacteremia. Samples of any sternal drainage should be sent for Gram stain and culture, also Mediastinal pacing wires should be sent for culture.[37]

Imaging:-

pneumomediastinum with an air-fluid level, Widening of the mediastinal shadow, pleural and pericardial effusions and lung abscess are the main finding from chest X-ray.[1,12]The more commonly used test is CT scan with contrast (Figures 1-3) can identify DM in its early course. It can shows varying degrees of tissue necrosis, soft tissue infiltration, localized collections, subcutaneous emphysema and gas bands (Figure 4). CT scans can also help in assessing infection spread and in planning surgical treatment.[8,15]

Prevention and Treatment and Complications:-

There are different Measures for preventing mediastinitis,for example: general aseptic techniques, Attention to hemostasis,Precise sternal closure, topical application of bacitracin ointment to sternotomy to decrease risk of mediastinitis after cardiac surgery.[38]

Antibiotics and surgical drainage are considered the primary treatment for DM.[8,9,26]

a good choice of empirical treatment includes Piperacillin-tazobactam and vancomycin .Another option is clindamycin plus ceftriaxone or ceftazidime.[13,23,27]

The main complication of descending mediastinitis is sepsis. Other complications include: pneumoperitoneum, pneumothorax and pleural effusions and pericarditis. [10,15,32]

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