



A 26-Year-Old Male with Chronic Chest Pain, Breathlessness and Thickened Pericardium

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Abstract

The article discusses the various causes of non-cardiac chest pain and the importance of identifying the underlying cause to provide appropriate treatment. We describe a case of a 26-year-old male with a one-year history of intermittent chest pain and recent onset breathlessness. The patient had consulted general practitioners and was treated for noncardiac chest pain and dyspepsia before presenting at the hospital. After various tests and evaluations, including an electrocardiogram, chest X-ray, echocardiogram, and high-resolution CT thorax, the patient was diagnosed with pericarditis caused by Mycobacterial tuberculosis. He was started on Rifampicin, pyrazinamide, ethambutol, and isoniazid, as well as a combination of colchicine, NSAIDs, and proton pump inhibitors. The patient's condition improved significantly, and he was discharged after enrolling in the Indian NIKSHAY TB program.

Keywords: Pericarditis; Chest Pain; Breathlessness

His blood pressure at admission was 118/70mm of Hg, Heart rate- 88bpm, Spo2 98% on Ambient air. ECG- sinus rhythm. Chest Xray- showed an enlarged cardiac silhouette, Echocardiogram - Presence of moderate pericardial effusion and thickened pericardium, Dilated LA, RA, Respiratory variation (>40%) across mitral and tricuspid valve, Thickened and prolapsed AML A1, A2, RVSP 32 mm of Hg, EF 50%. High-resolution CT thorax showed thickened pericardium (20 mm), bilateral pleural effusion, and Main Pulmonary artery (25 mm) s/o Pericarditis. Abdominal ultrasonography reveals a prominent IVC and hepatic vein, as well as splenomegaly and ascites. Pericardiocentesis was done- Fluid ADA- 59.2 U/L, sugar 35 mg/dl, Protein- 6.9 g/dl, lymphocyte predominant. Fluid PCR- positive for Mycobacterial tuberculosis, rifampicin sensitive. The patient was started on Rifampicin, pyrazinamide, ethambutol, and isoniazid (HRZE) at a weight-adjusted dose. For chest pain, the patient was given an NSAID (ibuprofen 600mg three times daily), a short course of prednisolone 40mg/day (5 days) and a proton

pump inhibitor (pantoprazole 40mg once daily). Three days later, the patient's hepatic transaminases were elevated, HRZE was withheld, and he still had chest pain despite NSAIDs, so he was started on colchicine, which is typically used in acute pericarditis as an adjunctive to NSAIDs on a case-by-case basis. Heart failure was treated with diuretics and an Aldosterone antagonist. His transaminases were reduced to 2 times ULN eight days after admission, and HRZE was restarted. And the patient's chest pain had decreased significantly after the addition of colchicine. His symptoms of breathlessness have come down, (NYHA class- I). Since the patient's symptoms improved significantly with pericardiocentesis and medication, a conservative approach was chosen. The patient was discharged after enrolling in the Indian NIKSHAY TB program and receiving HRZE, colchicine, NSAID, and a proton pump inhibitor.

Discussion

In patients, chest pain is associated with fear and anxiety. Chest pain can have both cardiac and noncardiac causes. It is estimated that 50-70 per cent of ER visits for chest pain are noncardiac [1]. They could be caused by musculoskeletal diseases in 40%, gastrointestinal diseases in 20%, psychiatric diseases in 10%, and pulmonary and mediastinal diseases in 5% [2]. Non-cardiac chest pain has a comparable reduction in quality of life to cardiac chest pain and has a significant psychological impact on the individual [3,4]. It is therefore critical to identify the cause of non-cardiac chest pain.

Causes of non-cardiac chest pain

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|--|
| Musculoskeletal |
| Trauma to the chest wall |
| Muscle strain |
| Costochondritis |
| Tietz syndrome |
| Rheumatological causes- fibromyalgia, SLE, RA, Ankylosing spondylitis etc. |
| Gastrointestinal: |
| Gastroesophageal reflux disease |
| Oesophageal dysmotility disorders (nutcracker oesophagus, DES) |
| Achalasia cardia |
| Gastritis, gastric ulcers |
| Esophagitis- pill-induced, infectious |
| Pulmonary: |
| Pneumonia |
| Pleurisy |
| Pulmonary embolism |
| Lung cancer |
| Sarcoidosis |
| Pneumothorax |
| Mediastinal: |
| Mediastinal mass |
| Pericarditis |
| Mediastinitis |
| Pneumomediastinum |
| Other: |
| Herpes zoster |
| Sickle cell crisis |
| Psychological disorders |

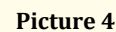
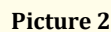
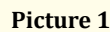
Table 1

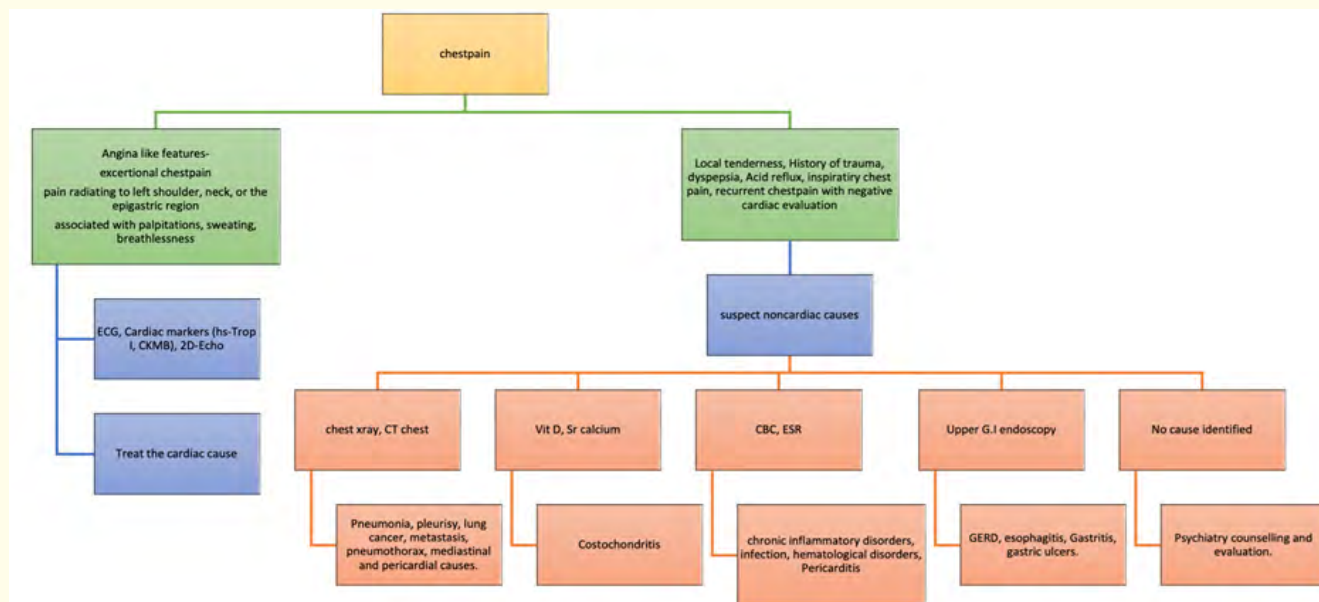
If a patient presents with chest pain and the initial evaluation for potentially life-threatening cardiac causes is negative, noncardiac chest pain should be considered. Noncardiac pain can be distinguished from cardiac chest pain when the history is correctly accessed. The characteristics of chest pain aid in differentiating the causes- Trauma, costochondritis, or muscle sprain can all cause chest pain with local tenderness. Gastritis or a gastric ulcer could cause burning chest pain associated with food consumption. Pleurisy or pericarditis may cause chest pain that worsens with inspiration. Fever and chest pain could be symptoms of pneumonia, pleurisy, tubercular pericarditis, or lung cancer. Episodic chest pain unrelated to exertion could be caused by oesophageal causes, or acid reflux could be caused by GERD, Esophagitis. Patients need to be further evaluated with basic investigations like complete blood count, ESR, CRP, and specific investigations like Chest Xray where pleurisy or pneumonia and other pulmonary Etiology are suspected; upper GI endoscopy, pH manometry were GERD, oesophageal motility disorders and achalasia cardia is suspected;

Mediastinal mass, mediastinitis, and pneumomediastinum can be further assessed with HRCT thorax.

In this case, the patient underwent preliminary blood tests, which were inconclusive. A chest X-ray revealed an enlarged cardiac silhouette, and a 2D echo revealed moderate pericardial effusion. A thoracic HRCT revealed thickened pericardium and pericardial effusion. Pericardial fluid analysis revealed lymphocyte predominance, high protein, and low glucose, with RT-PCR reactive for M. tuberculosis and rifampicin sensitivity (53-70 per cent sensitivity, 98 per cent specificity) [5,6]. Fluid ADA was 59.2 U/L, value above 35U/L (sensitivity- 82.1%, specificity- 92.4%) is diagnostic of Tuberculous pericarditis [6]. As a result, performing both ADA and RT-PCR increases the likelihood of correctly diagnosing pericardial tuberculosis. An ultrasound of the abdomen revealed mild ascites and splenomegaly, which could be due to tuberculosis. Tuberculosis is a leading cause of chronic pericarditis, especially in tropical countries like India. Chronic pericarditis can also be caused by connective tissue disorders, chronic kidney disease, or hypothyroidism.

The patient was prescribed Rifampicin 10mg/kg, Isoniazid 5 mg/kg, Ethambutol 15 mg/kg, and Pyrazinamide 25 mg/kg, but they were withheld due to elevated liver enzymes above 5 times the ULN. He had chest pain that is intractable to ibuprofen 600 mg TDS, Naproxen was replaced with ibuprofen. Chest pain didn't resolve.





Picture 5

| Lab parameter | At admission | 3 days after admission | 5 days after admission | 8 days after admission | 10 days after admission |
|--------------------|-----------------------|------------------------|------------------------|------------------------|-------------------------|
| Haemoglobin | 13.1 mg/dL | 13.6 | 13 | 13 | 12.6 |
| TLC | 15.9k/mm ³ | 7.54 | 7.0 | 8.2 | 8 |
| Neutrophils | 80% (40-80) | 62.6 | 63.2 | 63 | 63.2 |
| Lymphocytes | 10.9% (20-40) | 26.0 | 25.7 | 26 | 25.6 |
| Monocytes | 8.1% | 9.0 | 8.1 | 8 | 9.0 |
| Eosinophils | 0.9% | 2.1 | 2.4 | 2.5 | 2.1 |
| Basophils | 0.1% | 0.3 | 0.6 | 0.6 | 0.4 |
| Platelet count | 119 k/mm ³ | 105 | 115 | 130 | 150 |
| MCV | 96.1 fL | 96.1 30.3 | | | |
| M | 30.3 pg | | | | |
| Bilirubin total | 1.4 mg/dL | 0.68 | 0.98 | 1.41 | 1.38 |
| Bilirubin Direct | 0.65 mg/dL | 0.28 | 0.41 | 0.65 | 0.77 |
| Bilirubin Indirect | 0.75mg/dL | 0.40 | 0.57 | 0.76 | 0.61 |
| SGOT | 57 U/L (0-37) | 187 | 68 | 49 | 48 |
| SGPT | 52 U/L (0-40) | 140 | 136 | 93 | 74 |
| ALP | 90 U/L (30-120) | 80 | 84 | 89 | 87 |

| | | |
|---------------|--------------|-------|
| Total protein | 6.7 g/dL | 6.7 |
| Albumin | 3.9 g/dL | 3.7 |
| Globulin | 2.80 g/dL | 3.0 |
| Creatinine | 1.10 mg/dL | 0.94 |
| Urea | 37.42 mg/dL | 28.92 |
| Na+ | 136.3 mmol/L | 136 |
| K+ | 4.06 mmol/L | 4.02 |
| Ch- | 100.5 mmol/L | 101 |
| NT-proBNP | 2670 pg/mL | |
| Trop-T | <1.5 | |
| CK-MB | 8 IU/L | |
| ESR | 48 mm/hr | |
| CRP | 38 mg/dL | |

Table 2

Conclusion

Chronic chest pain accompanied by an inconclusive cardiac evaluation should prompt clinicians to consider other causes of chest pain such as musculoskeletal, gastrointestinal, pericardial, and pulmonary causes. Outpatient evaluation should include a chest X-ray, ECG, and cardiac markers to rule out cardiac causes such as MI. In patients with chronic chest pain, inflammatory markers should be performed to look for inflammatory conditions. When other causes cannot be identified, patients should be offered an echocardiogram on a case-by-case basis to look for pericardial disease and HRCT thorax. Since the rt-PCR has less sensitivity compared to ADA in diagnosing pericardial tuberculosis, both ADA and RT-PCR of pericardial fluid will increase diagnostic accuracy. Prompt initiation of anti-tubercular drugs in tubercular pericarditis can prevent long-term complications such as recurrent pericarditis, pericardial adhesions, and constrictions. Pericarditis-related chest pain should be treated with NSAIDs; steroids may be considered in patients whose symptoms do not improve with NSAIDs [8]. Colchicine, which is used to treat acute pericarditis and prevent relapses, may be useful in reducing inflammation and thus improving chest pain in patients with chronic pericarditis whose pain does not improve with NSAIDs.

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