Priorities in Patient Presenting to Emergency Department with Chest Pain

Göğüs Ağrısı İle Acil Servise Başvuran Hastada Öncelikler

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INTRODUCTION

Patients present to emergency department with chest pain could become like problem tangles that should be solved by physicians(1). While Acute Coronary Syndromes (ACS) were detected in 1/5 of patients presenting with chest pain, diseases with high mortality rates such as pulmonary thromboembolism (PE) and aortic dissection constitute a small percentage of patients (2). Musculoskeletal chest pain, pain originated from other thoracic and intra-abdominal organs and psychiatric origin pains constitute a major portion of the remaining causes of chest pain(2). Because of high sudden death risk in patients with cardiac origin chest pain, accurate differential diagnosis of wide range chest pain types in a short time is very important. The common causes of chest pain are mentioned in the Table 1.

Medical history of the patient is important in the differential diagnosis of cardiac symptoms. Presence of heart disease, previously stable angina pectoris (SAP) history, multiple risk factors for coronary...
artery disease and anti-ischemic drug usage are important details. Risk factors such as family history, smoking, dyslipidemia, hypertension (HT), diabetes mellitus (DM), presence of cerebrovascular disease (CVD) and peripheral arterial disease (PAD) should be examined quickly.

Chest pain is the most common and the most important symptom of the patients admitted to emergency department with chest pain (2,3). Chest pain caused by myocardial ischemia due to severe or total occlusion of the coronary arteries, defined as angina pectoris (2-4). Angina pectoris in acute coronary syndrome have some definitive characteristic features. These are precipitated by factors such as; stress, exercise, cold, easing but not completely covering with sublingual short-acting nitrates, pressure or burning feeling on retrosternal and precordial location (4).

Angina may occur in the form of previous stable angina pectoris that arises with less effort, last longer and require more rest or nitrate to relief, or it can be seen as pain that lasts more than 20 minutes and occurs also during rest (4,5). Though the location of pain is usually in precordial and retrosternal region, it can be seen in far below the chin and the settlement usually can be in any region from epigastric region to chin. It may radiate to both arms. As a difference from stable angina pectoris, this pain does not relief with sublingual short-acting nitrate preparations or alleviates partially (4).

Although it is thought that; the diagnosis of ACS can be considered easy with existing knowledge, unfortunately it is overlooked in some cases. Additionally loss of time before diagnosis causes an increase in morbidity and mortality (4). Patients with overlooked diagnosis generally don’t admit with typical clinical presentation. Atypical clinical presentations include; the short duration of angina, slight presence of pain, inability to feel pain because of the high pain threshold or autonomic neuropathy, presentation with dyspnea, admission with cardiac arrest or unable to express herself due to CVD, admission with accompanying predominant clinical presentations and undiagnosable ECG findings. These situations may delay the diagnosis of the physician in the emergency department (4). It should not forget that; to begin treatment as early as possible in patients with ACS, reduces the amount of myocardial ischemic tissue which becomes necrotic tissue and it reduces the risk of mechanical and arrhythmic complications (5).

A physician who meet a patient with chest pain, should complete the anamnesis, physical examination and an ECG recording within 10 minutes (6,7). In the absence of ischemia findings in ECG, the diagnosis of ACS should not be excluded and patient should be followed up. Because a significant proportion of patients whose diagnosis were overlooked have been misdiagnosed. In this situation, patients' ECG record should be taken at the time of the rise in complaints, or ECG records and cardiac enzyme samples should be repeated in each 4 hours and they must be followed-up at least 12 hours, even if there is an improvement in complaints (2). Patients who have no ECG and enzyme changes during twelve- hour follow-up periodie, are in low risk group and can be followed-up as outpatients even though they are with ACS (2).

ST-T wave changes which are consecutive in precordial leads or at least in two derivation that records the same area in the ECG, support the diagnosis of acute coronary syndrome. Isolated posterior and isolated right myocardial infarction (MI) diagnosis can be overlooked due to inappropriate assessment or not to record of ECG, though rarely (8).
Some of the patients are admitted with gastrointestinal complaints such as; abdominal pain, nausea and vomiting that have been suggested to gastrointestinal pathologies (2). These patients are evaluated firstly with ultrasound and computerized tomography in terms of intra-abdominal pathology. These radiological evaluations are usually conducted in isolated rooms. It is not possible to do emergency action in these rooms in the situation of cardiac arrest. Also the time for reporting the investigations lead to a waste of time in these patients. Besides delay in the diagnosis, it may result in fatal complications in patients with cardiac risk factors and the history of coronary artery disease, to perform these diagnostic tests before comprehensive evaluation and ECG record. Especially if an acute pathology is not considered to explain this clinical situation, patients can be discharged without seeing the ECG records. Also in some of the patients, ACS may accompany for abdominal pathology. It makes the diagnosis more difficult. For example, angina due to eating too and pain due to mesenteric artery ischemia can occur simultaneously and these pain types can respond in a similar way to sublingual and a short-acting nitrate(9). Additionally, esophageal spasm related pain decreases with sublingual short-acting nitrates (10). In this situation, acute coronary syndromes should be considered firstly because of their high morbidity and mortality rates. Therefore, it must be prioritized, the cardiac evaluation and ECG recording of the patients who admitted to the emergency department with chest pain and have high cardiac risk. Telecardiography is required in the patients with chest pain for the differentiation of other pathologies associated with high mortality, such as pneumothorax, aortic dissection and pulmonary thromboembolism (11,12). But performing the telecardiography firstly in emergency conditions will prolong the diagnostic period the same as in ultrasound imaging. And if it is not performed bedside, in a situation of malignant arrhythmia, it will cause malpractice. Therefore, it must not be performed before cardiac evaluation and ECG recording. Again, if possible, it should be performed bedside in the emergency department and the patient must be monitorized.

When the patients who have admitted to emergency department as repeated times due to chronic diseases such as peptic ulcer, dyspepsia, CVD, they were evaluated primarily in terms of old diseases. Although they have admitted to the emergency department with chest pain. Due to this situation, the diagnosis and treatment of ACS could be delayed (13). Especially waiting to get response to antacid preparations in dyspepsia and peptic ulcer pain which could be misdiagnosed with inferior wall myocardial infarction, could take a long time. In addition to this, emergency physicians are prejudiced against the patients who were admitted to the emergency department for repeated times due to their psychiatric problems(12).

In patients with ACS, dynamic ECG changes are also evident in time as the enzyme changes. Especially if the patient's baseline ECG is normal, it becomes more important to monitor the ECG changes. The first ECG is diagnostic only in 50% of acute coronary syndromes (14). This may lead physicians to research to the other pathologies.

In summary, priority in the patients with chest pain must be; a quick medical history, assessment of cardiac risk and evaluation of ECG recording. Other priorities delay the diagnosis and treatment in patients with ACS for whom the minutes are very important.
Table 1. Differential Diagnosis and Treatment of Chest Pain

<table>
<thead>
<tr>
<th>Type of pain</th>
<th>Physical Examination</th>
<th>Diagnostic Tests</th>
<th>Diagnosis and Treatment</th>
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<tbody>
<tr>
<td>Chest pain which have the characteristic of pressure, burning and compressing, radiates to the jaw, neck, left arm, back and epigastrium, unresponsive or partial response to sublingual nitrate, accompanied by cold sweats and fear of death</td>
<td>Usually normal&lt;br&gt;May be sweating, crackles and heart murmurs, rarely accompany a state of shock. Blood pressure may be high, normal or low in pre-shock - shock.</td>
<td>ECG&lt;br&gt;Cardiac enzymes&lt;br&gt;Echocardiography</td>
<td>ACS&lt;br&gt;STEMI: PTCA, thrombolytics&lt;br&gt;NSTEMI: Medical or PTCA&lt;br&gt;USAP: Medical or PTCA</td>
</tr>
<tr>
<td>Sudden rised pleuritic chest pain, dyspnea, hemoptysis. Especially at high risk groups</td>
<td>Tachypnea, tachycardia, deep venous thrombosis, hemoptysis, decrease in blood pressure, changes in consciousness, JVD</td>
<td>Chest graph, V / Q scan, pulmonary angiography</td>
<td>PE Heparin, thrombolytics, embolectomy</td>
</tr>
<tr>
<td>Sudden onsetsed, ferocious, disruptive chest pain that may be radiated to the back and abdomen, and could be accompanied by neurological symptoms</td>
<td>New arised heart murmur, unequal blood pressure in the upper extremities</td>
<td>Chest graphy, echocardiography, contrast-enhanced thoracic CT, chest MRI, angiography</td>
<td>Aortic dissection&lt;br&gt;Urgent operation</td>
</tr>
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<td>Chest pain and dyspnea which relieves to lean forward supine and increases to cough and breathe deeply.</td>
<td>JVD</td>
<td>ECG, chest graphy, Echocardiography</td>
<td>Pericarditis&lt;br&gt;Medical</td>
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<td>Pleuritic chest pain and dyspnea</td>
<td>Decreased breath sounds</td>
<td>Chest graphy</td>
<td>Pneumothorax&lt;br&gt;Follow up (little) Tube decompression (big)</td>
</tr>
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<td>Retrosternal, epigastric pain</td>
<td>Sensible epigastrium</td>
<td>Chest graphy, esophageal barium X-ray</td>
<td>Oesophageal rupture&lt;br&gt;Surgical</td>
</tr>
<tr>
<td>Pleuritic chest pain, dyspnea, cough, chills</td>
<td>Fever, crackles, decreased breath sounds</td>
<td>Chest graphy, WBC</td>
<td>Pneumonia&lt;br&gt;Medical</td>
</tr>
<tr>
<td>Emotional stress-induced, pointed, limited to seconds or hours of chest pain</td>
<td>Normal</td>
<td>ECG&lt;br&gt;Cardiac enzymes&lt;br&gt;Echocardiography</td>
<td>Anxious chest pain&lt;br&gt;Medical</td>
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<td>Continuous localized pain in the chest after trauma</td>
<td>Chest pain in the described area by pressure</td>
<td>ECG&lt;br&gt;Cardiac enzymes&lt;br&gt;Echocardiography</td>
<td>Traumatic chest wall pain&lt;br&gt;Medical</td>
</tr>
<tr>
<td>Continuous chest pain</td>
<td>Pain in costochondral and xiphosternal by pressure and, swelling, redness in the relevant field</td>
<td>ECG&lt;br&gt;Cardiac enzymes&lt;br&gt;Echocardiography</td>
<td>Costochondritis&lt;br&gt;Medical</td>
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