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Case report

Differential diagnosis of chest pain

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Abstract

Introduction. Evaluation of the patients with chest pain is one of the biggest challenge for doctors. The priority is to exclude life-threatening causes of chest pain, acute coronary syndrome, aortic dissection, pulmonary embolism, rupture of the aortic aneurysm, and tension pneumothorax.

Case report. A 35-year-old man was admitted because of chest pain and concave ST elevation in inferior leads. Urgent coronarography was performed and coronary blood vesels are without significant stenosis. Echocardiography was normal. Cardiospecific markers as well as markers of inflammation were in the reference range. Signs of spontaneous pneumothorax in the apex of the left lung is registered on the chest X-ray. This pneumothorax did not require chest surgery and patient was discharge for home treatment.

Conclusion. In young, tall and skinny men in their third decade of life with a long-term smoking experience, pneumothorax should be thought of as a possible cause of chest pain. A detailed medical history and careful clinical examination, with adequate consideration of the clinical variables, contribute to the correct diagnostic-therapeutic algorithm.

Key words chest pain, differential diagnosis, spontaneous pneumothorax

Introduction

Evaluation of patients with chest pain presents one of the greatest challenges for physicians in the emergency department. Chest pain is a relatively common in the general population. About 5-25% of all patients admitted to general hospitals or intensive care are patients with chest pain[1]. During lifetime, about 25% of people have some type of chest pain[2]. When a patient presents with chest pain, it is a priority to rule out life-threatening causes of chest pain, such as acute coronary syndrome, aortic dissection, pulmonary embolism, rupture of an aortic aneurysm, and tension pneumothorax[3]. The most common cause of life-threatening chest pain is acute myocardial infarction[4]. In patients with non-life-threatening chest pain, a definitive diagnosis is usually made only after a medical history, physical examination, and additional non-invasive examinations. However, after evaluation, a certain patients are discharged with the diagnosis of nonspecific chest pain.

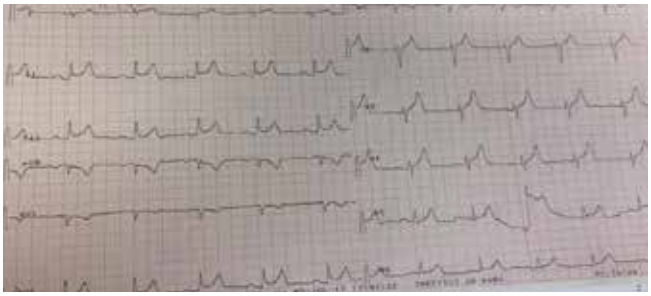

Figure 1. Electrocardiographically registered concave elevation of the ST segment in inferior leads
Slika 1. *Elektrokardiografski se registruje konkavna ST elevacija u inferiornim odvodima*

Case Report

The 34 years old patient was admitted to the intensive care unit because of the chest pain and electrocardiographically registered concave elevation of the ST segment in inferior leads (Figure 1). Chest pain, aggravated by inhalation, appeared about 4 hours before admission. He had not congestive problems and he did not lose consciousness. Long-term smoking experience and heredity are cited as risk factors for ischemic heart disease. Dual antiaggregation therapy was administered by the ambulance service. The physical finding at admission is normal. Because of the chest pain, electrocardiographic changes and risk factors urgent coronary angiography is indicated. Urgent coronarography was performed and normal luminogram of the coronary vessels are registered (Figures 2 and 3). After analgesic therapy, the problems are resolved. The day after admission, an echocardiographic examination was performed. The left ventricle of normal endocavitary dimensions and wall thickness are registered with preserved systolic and diastolic function. Fluid is not detected in the pericardium. The values of

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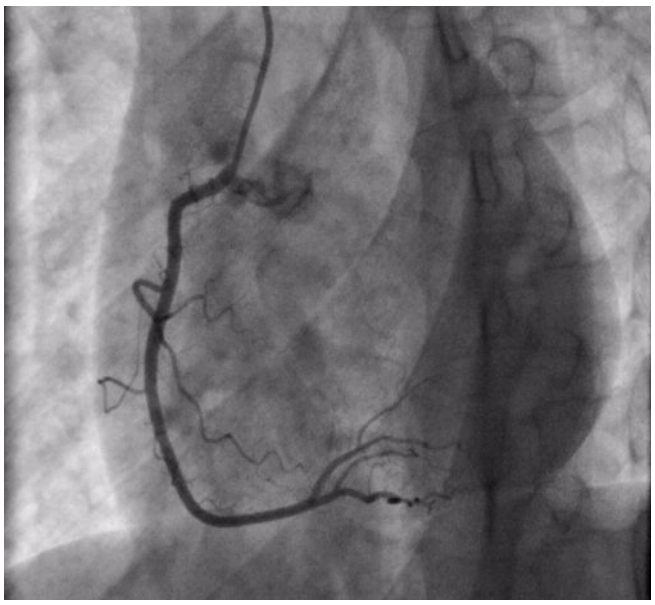

Figure 2. Coronarography registered right coronary artery without significant stenosis
Slika 2. *Koronarografijom se registruje uredan luminogram desne koronarne arterije*

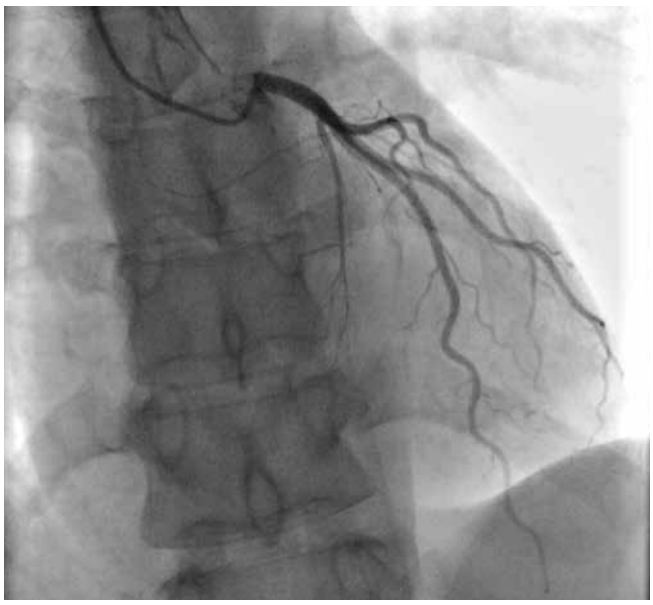

Figure 3. Coronarography registered system ACS without significsnt stenosis
Slika 3. *Koronarografijom se nađe uredan luminogram levog koronarnog sistema*

cardiospecific enzymes are in the reference range. Markers of inflammation are in the reference range, too and the patient had not the fever in the previous period. The diagnosis of acute pericarditis is also excluded. The anamnesis was supplemented by the information that the patient had left-sided spontaneous pneumothorax five years ago. He was than treated at a regional institution with left-sided thoracic drainage. Now, signs of spontaneous pneumothorax in the apex of the left lung are registered on the chest X-ray. A breast surgeon was consulted and the patient was transferred to the Clinic for Breast surgery, on the second day of admission. On the control chest X-ray, are registered signs of minimal collapse in the apex of the left lung, which do not require chest surgery. The patient was admitted for home treatment. After two weeks, on the Chest X-ray both lungs were fully reexpanded, and the patient had not subjective problems.

Discussion

Patients with chest pain present a challenge for physicians given the wide range of diagnoses that can be a cause of problems. Today, there is no clear diagnostic algorithm for evaluating these patients. The decision to keep patients in the hospital and the level of performing the diagnostic procedures depends on the experience of the physician and the diagnostic methods available. The basis of diagnostics is electrocardiography, determination of cardiospecific enzymes, echocardiographic examination and cheast X-ray. However, these diagnostic methods have limitations. One of the primary goals is to quickly and efficiently identify low-risk patients who do not require hospitalization. At the same time, rapid identification of high-risk patients and their care in the intensive care unit is necessary. Chest pain is a relatively common occurrence (1 admission in the intensive care unit per 1000 people per month) and significantly burdens the health system. Acute myocardial infarction is the most common cause of life-threatening chest pain. Some authors describe significant clinical variables for the rapid assessment of coronary disease risk[1]. Martinez-Selles and other authors observed 379 patients with chest pain from July 2003 to August 2004. They described a CPU-65 index, which consist four clinical variables: typical anginal pain, the presence of diabetes mellitus as comorbidity, patients older than 65 years and chronic aspirin use. Specifically, patients with chest pain which electrocardiography is undiagnosed and who have some of these clinical parameters are 2-3 times more likely to have coronary disease.[5] Patients who do not any of these clinical parameters have a coronary disease prevalence less than 4%. This patients had not an acute coronary event or fatal outcome during the follow-up period. Considering these, it is not necessary to determine cardiospecific enzymes in these patients, as well as more detailed diagnostics. This significantly contributes to reducing the cost of the health care system. On the other hand, patients who have 2-4 of these clinical variables have a 27-67% risk for developing an acute coronary event[5]. In these patients, special caution is required when discharging the patient and the decision to implement a further diagnostic-therapeutic algorithm.

Patients with chest pain are most often discharged with the diagnosis of nonspecific chest pain associated with lung disease. The most common causes are pulmonary thromboembolism, pneumonia and spontaneous pneumothorax as in our case[4]. Recent studies also indicate that about 7% of patients with pneumonia also have acute myocardial infarction[6]. Caution needed when evaluating these patients.

The etiology of spontaneous pneumothorax remains unknown in 90% of cases. It most commonly occurs in healthy young, tall and skinny men in their third decade

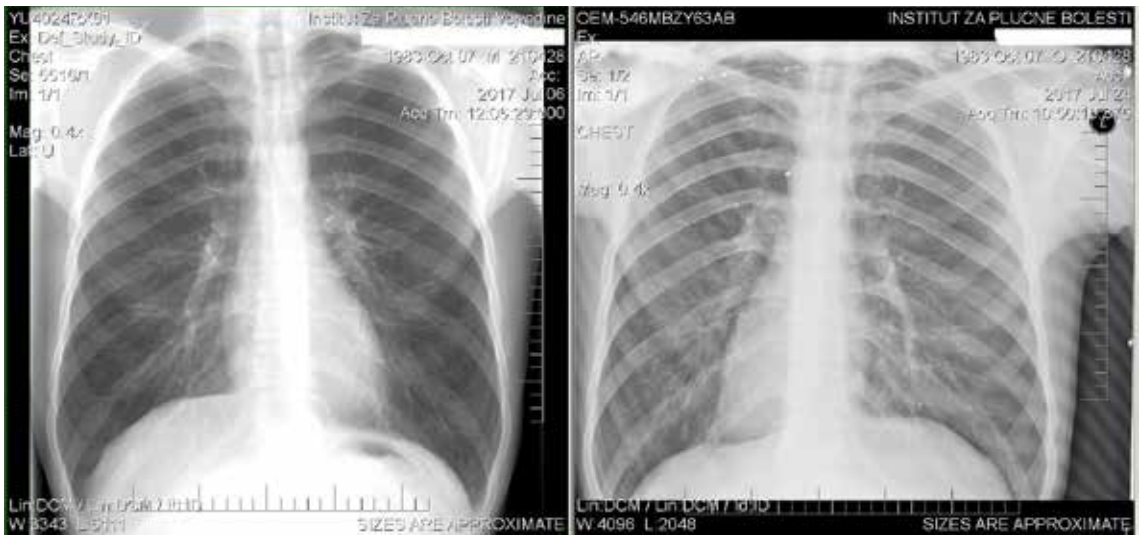

Figure 4. Signs of spontaneous pneumothorax in the apex of the left lung are registered on the chest X-ray
Slika 4. *Radiografskim snimkom grudnog koša se primećuje pneumotoraks u vrhu levog plućnog krila*

of life with long-term smoking experience. Our patient also had these characteristics.
Once again, it is confirmed that a detailed history and careful clinical examination contribute significantly to the correct diagnosis.

Conclusion

In young tall and skinny men in their third decade of life with a long-term smoking experience, pneumothorax should be thought of as a possible cause of chest pain. Also, a detailed history and careful clinical examination, with adequate consideration of clinical variables, contributes to a correct diagnostic-therapeutic algorithm.

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Sažetak

Diferencijalna dijagnoza bola u grudima

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Uvod. *Evaluacija bolesnika sa grudnim bolom predstavlja jedan od najvećih izazova sa kojim se suočavaju lekari. Prioritet je isključiti životno ugrožavajuće uzroke grudnog bola, a to su akutni koronarni sindrom, disekcija oarte, plućna embolija, ruptura aneurizme aorte i tenzioni pneumotoraks.*
Prikaz slučaja. *Bolesnik dobi 35 godina je primljen zbog bolova u grudima i konkavne ST elevacije ST segmenta u inferiornim odvodima. Urađena je koronarografija kojom se nađe uredan luminogram. Ehokardiografski pregled je uredan. Kardiospecifični enzimi kao i markeri inflamacije su u referentnom opsegu. Radiografski se registruju znaci spontanog pneumotoraksa u vrhu levog plućnog krila koji ne zahtevaju grudno-hiruršku intervenciju te je bolesnik bez tegoba, hemodinamski i ritmički stabilan, otpušten na kućno lečenje.*
Zaključak. *Kod mladih visokih i mršavih muškaraca u trećoj deceniji života sa dugogodišnjim pušačkim stažom treba misliti na pneumotoraks kao mogući uzrok grudnog bola. Detaljna anamneza i pažljiv klinički pregled uz adekvatno sagledavanje kliničkih varijabli doprinosi pravilnom dijagnsotičko-terapijskom algoritmu.*
Ključne reči: grudni bol, diferencijalna dijagnoza, spontani pneumotoraks.