

A rare cause of chest pain mimicking myocardial infarction

Miyokart enfarktüsünü taklit eden nadir bir göğüs ağrısı sebebi

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Summary– We present a patient who underwent endoscopic retrograde cholangiopancreatography procedure for bile duct stone removal and sphincterotomy. Upon completion of the procedure, the patient experienced severe chest pain. Because myocardial infarction was the likely diagnosis, we immediately performed a coronary angiography, which identified severe coronary lesions without any total occlusion. Being skeptical of the possible cause, we searched for alternative causes and interestingly found pneumothorax, pneumomediastinum, and retro-intra-abdominal free air. This rare complication is particularly important for a cardiologist because they should be aware of such a complication, and correlation with the symptoms and coronary lesions should always be made.

Clinical conditions that cause acute severe chest pain, apart from acute coronary syndromes, should be investigated promptly, particularly if the patient's hemodynamic status is compromised. Among these conditions, pneumothorax and pneumomediastinum should always be considered, especially if there is a suspected underlying cause.

In this case, we present a patient who developed sudden-onset severe retrosternal chest pain following an endoscopic retrograde cholangiopancreatography (ERCP) procedure, due to bilateral pneumothorax, pneumomediastinum and subcutaneous emphysema.

CASE REPORT

A 56-year-old female patient was taken to the cath lab for bile duct stone removal and sphincterotomy procedure. She had no prior cardiac disease. Towards

Özet– Bu yazıda safra yollarından taş çıkarılması ve sfinkterotomi için endoskopik retrograd kolanjiyopankreatografi işlemine alınan bir hasta sunuldu. İşlemin sonuna doğru hastada çok ciddi göğüs ağrısı gelişti. En muhtemel tanının akut miyokart enfarktüsü olması nedeniyle hasta acil olarak koroner anjiyografiye alındı ve tam tıkanmanın olmadığı ciddi koroner arter hastalığı tespit edildi. Şüpheli bulunan bu durum karşısında olası başka sebepler araştırıldı ve ilginç bir şekilde pnömotoraks, pnömomediastinum ve intra-retro abdominal serbest hava tespit edildi. Nadir rastlanan bu komplikasyon kardiyologlar tarafından bilinmeli ve her zaman koroner lezyonlarının hastanın semptomları ile olan ilişkisi sorgulanmalıdır.

the end of the ERCP procedure, which included multiple balloon dilatations and sphincterotomy, the patient suddenly developed severe retrosternal chest pain, profound sweating and mild hypertension. Since the pain was so intense and typical for acute myocardial infarction, the attending gastroenterologist immediately informed the cardiologist for further investigation. An ECG was taken immediately, and there was a 0.5 mm ST depression in the precordial leads. After a brief consultation, while the patient was still on the angiography table, it was decided to perform a coronary angiography and coronary intervention if necessary. The procedure, which was performed within 10 minutes of the onset of symptoms, revealed three-vessel disease. Although the lesions looked severe enough to cause ischemia, free air under the diaphragm was also

Abbreviations:

CT	Computed tomography
ERCP	Endoscopic retrograde cholangiopancreatography

Received: January 10, 2014 Accepted: February 13, 2014

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noticed (Figure 1a, b). Being skeptical of the possible cause of the chest pain, other possible factors were investigated. During this search, it was noted that the whole abdomen and chest fluoroscopies were darker than expected for a standard procedure. This raised the question of free air in both spaces. Therefore, it was decided to perform a computed tomography (CT) of both the abdomen and thorax. Interestingly, this revealed bilateral pneumothorax, pneumomediastinum, subcutaneous emphysema, and abdominal free air (Figure 1c, d).

In order to search for a perforation, the patient was taken to the operating theater for exploration and was found to have a duodenal perforation. Along with repair of the duodenum, two chest tubes were placed

for the pneumothorax. The remaining course was uneventful, and the patient was discharged one week later in good condition.

DISCUSSION

Retroperitoneal perforation, along with pneumothorax and pneumomediastinum, is an uncommon complication of ERCP, with an incidence between 0.3 and 2.1%.^[1] It can occur at any age, mostly on the right side, and free air is generally also found in the mediastinum, retroperitoneum, intraperitoneal cavity, and subcutaneous tissues.^[2] The main risk factor is sphincterotomy. Conservative treatment, including chest tube insertion, antibiotics and fasting, is generally applied, and the prognosis is favorable.^[3]

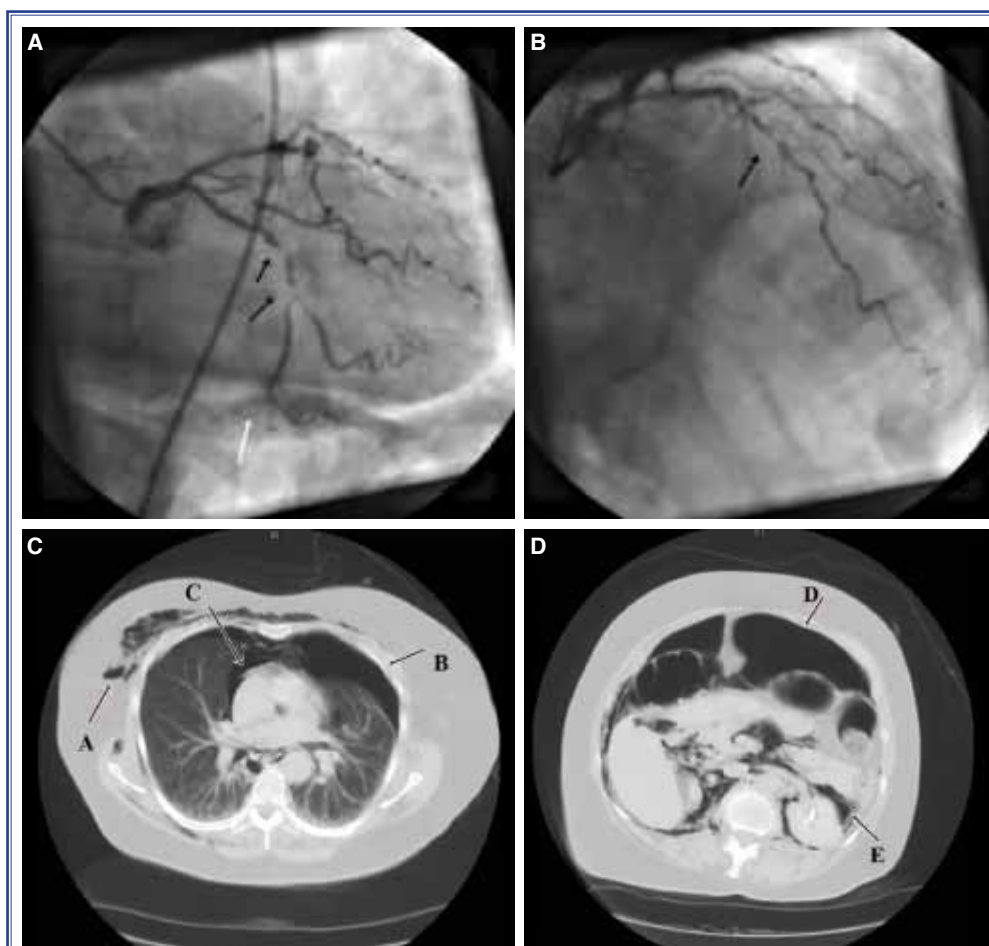


Figure 1. (A) Anteroposterior (A-P) caudal view shows consecutive severe coronary lesions in the circumflex artery (black arrow). Note also the sub-diaphragmatic free air (white arrow) and the background darkness (indicative of air in the mediastinum). (B) A-P cranial view showing severe LAD artery stenosis (black arrow). LAD: Left anterior descending. (C) Thoracic CT showing subcutaneous (A), and mediastinal (C) free air. There is also bilateral pneumothorax (B). (D) Abdominal CT scan showing intra- and retroperitoneal free air (D, E).

Several pathophysiological mechanisms underlying ERCP-related pneumomediastinum and pneumothorax have been proposed. The most frequent cause is sphincterotomy most likely performed too deep, resulting in duodenal barriers being destroyed and allowing air to enter the retroperitoneal space.^[4] Subsequently, air can spread to the mediastinum, pleural space and subcutaneous tissues. It has been suggested that a continuum of fascial planes connects cervical soft tissues with the mediastinum and retroperitoneum.^[5] Insufflation of air can exacerbate this process.

An alternative mechanism proposed is the porous diaphragm syndrome, which is characterized by pores within the diaphragm formed congenitally or acquired. It is believed that these pores let air pass between two cavities.^[6] However, one of the pitfalls of this theory is that intraperitoneal air is not uniformly present in patients with pneumothorax and pneumomediastinum complicated by ERCP. Another exacerbating factor is the Valsalva maneuver, which facilitates spreading of air through subcutaneous tissues.^[7] Once suspected, a CT scan easily reveals air both in the thorax and abdomen. Therapy is usually conservative, and routine exploratory surgery to find the perforation site is not necessary. Tube drainage of the pneumothorax, broad-spectrum antibiotics, fasting, and oxygen therapy are the general treatment regimens.^[8]

From a cardiology perspective, one should always be aware of such complications resembling myocardial infarction. Many disorders apart from acute coronary syndromes cause chest pain. These disorders may involve the gastrointestinal, pulmonary, neurologic, and musculoskeletal systems. Some disorders are immediately life-threatening. These include aortic dissection, tension pneumothorax, esophageal rupture, pulmonary embolism, and cardiac tamponade. Other causes range from potential threats to life to causes that are simply uncomfortable. Overall, the most common causes are chest wall (involving muscle, rib or cartilage), pleural and gastrointestinal (esophageal reflux, ulcer disease, cholelithiasis) disorders. An advantage of having the patient lying on the fluoroscopy table is that a quick search for excessive air in the abdomen, sub-diaphragmatic space, mediastinum, and pleural space is quite feasible. If coronary angiography is performed, the operator should notice that the background is profoundly darker because of the mediastinal air. In our example, this was the indicator leading

to the search for other causes. Even though there may be severe coronary lesions, correlation of symptoms and the appearance of lesions should always be made. If coronary revascularization is attempted along with the aggregant and anticoagulant therapy, the management of the complication can even worsen.

In conclusion, pneumomediastinum and pneumothorax represent a rare complication of ERCP. The most common pathophysiology is retroperitoneal perforation due to sphincterotomy, which further leads to the spreading of air into the thorax and subcutaneous tissues. General conservative therapy including tube placement, fasting, oxygen, and antibiotics is adequate.

Conflict-of-interest issues regarding the authorship or article: None declared.

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Key words: Cholangiopancreatography, endoscopic retrograde; myocardial infarction; pneumothorax; pneumomediastinum.

Anahtar sözcükler: Kolanjiyopankreatografi, endoskopik retrograt; miyokart enfarktüsü; pnömotoraks; pnömomediastinum.