Pneumopericardium following tracheostomy closure

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ÖZET

Trakeostomi kapatıldıktan sonra gelişen pnömoperikardiyum

Perikardiyal kesede hava bulunması beklenmedik bir bulgudur ve nedeni belirsiz kalır. Kırk bir yaşında erkek hastada, trakeostomi kapatıldıktan bir gün sonra şiddetli öksürük atağını takiben gelişen pnömoperikardiyum olgusu sunulmaktadır. Hemodinamik ve akciğer grafileriyle izlem ile konservatif yaklaşım etkilidir.

Anahtar Kelimeler: *Trakeostomi, pnömoperikardiyum, öksürük.*

SUMMARY

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Air within the pericardial sac is an unusual finding and its cause remains elusive. A case of a 41-year-old man with pneumopericardium following an episode of persistent cough one day after tracheostomy closure is presented. Conservative management with hemodynamic monitoring and serial chest X-rays was effective.

Key Words: *Tracheostomy, pneumopericardium, cough.*

Air within the pericardial sac is an unusual finding and its cause remains elusive. Pneumopericardium is usually associated with trauma, infection, fistula formation or iatrogenic disease states. It may also occur, in patients with barotrauma secondary to a blast or Valsalva maneuver. This report describes a 41-year-old man with pneumopericardium following an episode of persistent cough one day after tracheostomy closure.

CASE REPORT

A 41-year-old man entered our hospital for an asymptomatic ulcerative tongue lesion which proved to be squamous cell carcinoma. Staging of the disease was negative for local or distant spread and induction chemoradiation was the treatment of choice (cisplatin -6 cycles 30 mg/m^2 and 4500 rads with a boost dose of 1500 rads to the base of tongue). At the end of chemoradiation no remission of the disease was noticed and surgical operation was suggested. Hemiglossectomy with ipsilateral radical neck dissection and a prophylactic tracheostomy were performed. The post-operative course was uncomplicated and on postop day 8, the patient underwent tracheostomy closure.

One day later the patient complained of a dull substernal chest pain associated with persistent cough which worsened with deep breathing. On physical examination the patient was found to be alert, afebrile and in mild respiratory distress with a respiratory rate of 24 breaths/min, a pulse of 100 beats/min and a blood pressure of 105/70 mmHg. Chest examination showed bronchial breath sounds bilaterally. Cardiac examination revealed normal S1 and S2 and no murmurs or friction rub were heard. Electrocardiographic findings were within normal limits.

A chest X-ray showed the presence of pneumopericardium without any active pulmonary infiltrates or presence of pneumothorax or subcutaneous emphysema (Figure 1). A computed tomographic scan of the chest confirmed pneumopericardium with no associated pericardial effusion.

The patient remained in the intensive care unit for 48 hours to be observed closely, in order to prevent tension pneumopericardium and cardiac tamponade. The chest pain resolved over the first 48 hours with conservative therapy. Repeat chest X-rays showed no increase in pneumopericardium. Ten days later, chest radiograph showed complete resolution of the pneumopericardium (Figure 2).

DISCUSSION

Pneumopericardium, the presence of air in the pericardial space is a rare disorder and first described in 1844 by Bricheteau. Etiology of pneumopericardium can be classified as one of four types: Trauma (secondary to pericardial perforation), infection (secondary to gas-forming microorganisms), fistula formation between the pericardium and air-containing structures (bronchial tree, gastrointestinal tract, pleural or peritoneal cavity) and iatrogenic (thoracentesis, post-sternal marrow biopsy, assisted-positive pressure ventilation, esophagostomy)(1).

In the case described here, pneumopericardium developed spontaneously one day after the tracheostomy closure during an episode of persistent cough. This is in complete accordance with the Macklin effect which describes the sequence of events in the development of pneumomediastinum as follows: Alveolar rupture (sudden expiratory pressure-Valsalva manuever), air dissection along the bronchovascular sheath and free air reaching the mediastinum (2). Zylak et al. expanded that theory and noted that the mediastinum communicates with the submandibular space, the retropharyngeal space and vascular



Figure 1. A chest X-ray showed the presence of pneumopericardium.

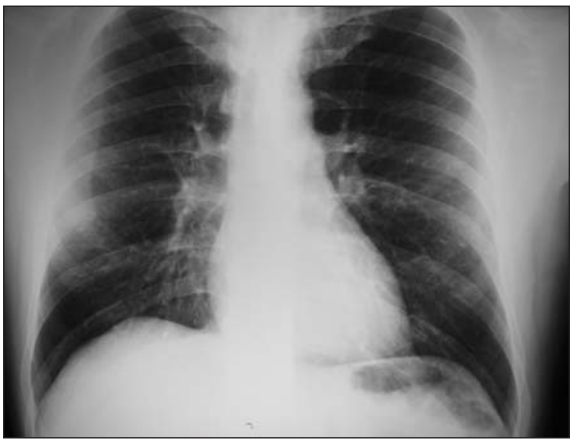


Figure 2. Ten days later, chest radiograph showed complete resolution of the pneumopericardium.

sheaths within the neck (2). In addition, 2 routes of communication with the retroperitoneum have been noted; via a tissue plane extending through the sternocostal attachment to the diaphragm, as well as periaortic and periesophageal fascial planes. As a result, air present within the mediastinum may dissect through these tissue planes, causing pneumopericardium, pneumothorax, subcutaneous emphysema, pneumoperitoneum or pneumoretroperitoneum.

Symptoms of pneumopericardium may be absent or may include dyspnea, precordial chest pain, upper abdominal pain or syncope. Physical findings may be absent or may include associated subcutaneous emphysema, precordial hyperresonance and a bubbling or crackling sound synchronous with the heart beat or a friction rub best heard in the left lateral decubitus position. Cardiac tamponade may result from the progressive accumulation of air around the heart. In our case a dull substernal pain was the main symptom.

Radiographically the feature which suggests pneumopericardium is a radiolucent area along the lateral borders of the heart. Electrocardiogram is usually normal and signs of pericardial involvement are absent except for cases of pyopneumopericardium.

Treatment of pneumopericardium is directed primarily toward its complications, most specifically the development of cardiac decompensation. Surgical intervention, catheter or needle drainage are the appropriate methods. Serial chest X-rays and hemodynamic monitoring are very important besides the fact that in most cases pneumopericardium has a benign course.

Although many case reports link pneumopericardium to an underlying disease process, our patient developed an apparently spontaneous pneumopericardium a few hours after tracheostomy closure. To our knowledge, there has been no previous report of pneumopericardium in association with tracheostomy closure. Conservative management with hemodynamic monitoring and serial chest X-rays was effective.

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