

A case report of superior vena cava obstruction

Süperior vena kava tıkanıklığı olan bir olgu sunumu

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Summary– We report herein an 83-year-old gentleman with lung cancer who presented with nausea, complete atrioventricular (AV) block and presyncope. Despite a present temporary pacemaker, which had been inserted through the femoral vein 5 days previously, the patient had asystole attacks that resolved with atropine administration. Coronary angiography demonstrated no critical stenosis. Sick sinus syndrome was diagnosed, and permanent pacemaker implantation was decided. However, the guidewire could not be advanced into the superior vena cava (SVC). Right jugular venogram showed complete obstruction of the SVC. Subsequent computerized tomography also revealed its obstruction by a large lung tumor. Special attention should be given to patients with benign or malignant SVC syndrome before permanent pacemaker implantation.

Özet– Akciğer kanseri olduğu bilinen 83 yaşında erkek hasta bulantı, presenkop ve tam atriyoventriküler (AV) blok ile acil servise getirildi. Beş gün önce sağ femoral venden yerleştirilmiş geçici pacemaker (PM) olmasına rağmen atropine cevap veren asistoli atakları oldu. Koroner anjiyografide koroner arterlerde kritik darlık görülmedi. Hasta sinus sendromu düşünülerek kalıcı PM konmasına karar verildi. İşlem sırasında subklaviya veni girişinde rehber tel brakiyosefalik venden süperior vena kavaya (SVC) ilerletilemedi. Eş zamanlı sağ juguler venogram SVC tam tıkanıklığını gösterdi. Bilgisayarlı tomografi sağ akciğer üst lobunda SVC'ye baskı yapan büyük tümörü ortaya koydu. Benign ya da malignant SVC sendromu olan olgularda PM yerleştirilmesinden önce özel önem ve dikkat gerektiğini anımsatmak istedik.

Chronic obstruction of blood flow in the superior vena cava (SVC) is designated as SVC syndrome. Patients generally present clinically with typical symptoms of dyspnea, shortness of breath, and swelling of the face, neck, extremities, and upper chest. SVC obstruction occurs in 5-10% of patients with a right-sided malignant intrathoracic mass lesion. Malignant causes are more common in the age group of 40-60 years and are usually secondary to lung or mediastinal origin. Benign causes are more common in the age group of 30-40 years. With the increasing number of cardiovascular interventions, the incidence of benign causes is increasing. Intravascular device and fibrosing mediastinitis are the most common benign etiologies.^[1-5]

CASE REPORT

An 83-year-old male with known stage four pulmonary epidermoid adenocancer, diabetes mellitus (DM) and Alzheimer's disease presented to the emergency room with nausea and fainting spell. His pulse rate was 35 per minute. His ECG revealed complete atrioventricular (AV) block (Fig. 1). There was no reversible cause of AV block such as electrolyte disorder or medical drug usage. His blood pressure was low (80/50 mmHg), and oxygen saturation was decreased (80%). He was transferred to critical care. Consultation with a pulmonary team

Abbreviations:

AV Atrioventricular
CT Computerized tomography
ICU Intensive care unit
SVC Superior vena cava

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and oncology team led to an estimated survival time of less than a few months.

The patient had asystole attacks three times in the same day despite having a temporary pacemaker that had been inserted through the right femoral vein five days previously. Atropine administration corrected the current situation. The patient had rapid atrial fibrillation, AV complete block, and bradycardia and asystole attacks. He had several attacks of respiratory arrest, which responded to bronchodilators, oxygen and continuous positive airway pressure (CPAP). Coronary angiography was performed and showed left anterior descending (LAD) 40%, left circumflex (LCx) 40-50%, and right coronary artery (RCA) 60% disease (Fig. 2a). His echocardiogram demonstrated 30% ejection fraction (EF) with diffuse hypokinesia and systolic dysfunction, but no significant valve pathology or pericardial disease. Arterial blood pH value was 7.12. Intubation, ventilation and oxygen support helped the acidosis. Despite the correction of lactic acidosis, AV block did not resolve. During the follow-up, sick sinus syndrome was diagnosed, and permanent pacemaker implantation was decided. After the left subclavian puncture, the guidewire could not be advanced through the brachiocephalic vein to

the SVC. An immediate right jugular vein venography revealed complete obstruction of the SVC (Fig. 2b). Since the patient's clinical condition rapidly deteriorated, he was transferred to the intensive care unit (ICU). There was not enough time for placement of an epicardial pacemaker. Subsequent computerized tomography (CT) scan was performed, and it further defined a large right-sided upper lobe lung tumor compressing the SVC (Fig. 2c, d). The patient died on the same day in the ICU because of repetitive respiratory arrest.

DISCUSSION

Obstruction and thrombosis of the SVC, termed SVC syndrome, is typically an acquired condition most commonly secondary to malignant causes such as pulmonary or mediastinal malignancy. Benign causes include infection, idiopathic mediastinal fibrosis, retrosternal thyroid, aortic aneurysm, benign tumors, mediastinal hematoma, sarcoidosis, radiation fibrosis, and iatrogenic causes, such as a complication of the increasing number of central venous catheter placements and implantations of pacemakers and cardioverter-defibrillators.^[3-5] In cases associated with malignancies, causes are usually secondary to mass



Figure 1. ECG showing complete AV block.

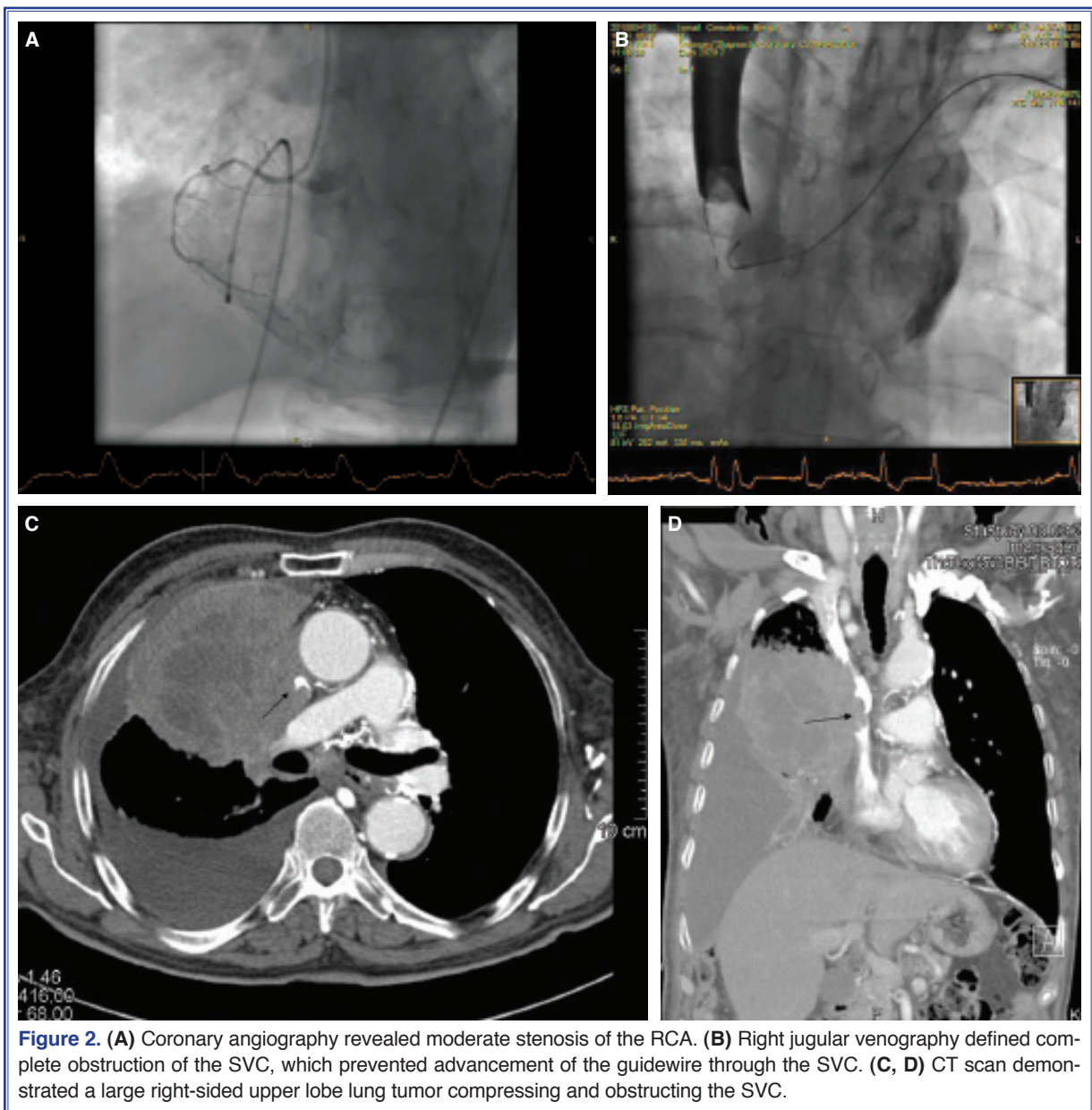


Figure 2. (A) Coronary angiography revealed moderate stenosis of the RCA. (B) Right jugular venography defined complete obstruction of the SVC, which prevented advancement of the guidewire through the SVC. (C, D) CT scan demonstrated a large right-sided upper lobe lung tumor compressing and obstructing the SVC.

effect or pressure and invasion of a tumor. In cases of fibrosing mediastinitis, fibrosis is responsible for SVC syndrome. In iatrogenic cases, it is usually secondary to thrombosis. Currently, obstruction of the SVC caused by thrombosis or non-malignant conditions accounts for 35% of the cases, reflecting the increased use of devices such as catheters and pacemakers. The majority (65%), however, are still due to malignant causes such as pulmonary or mediastinal malignancies. Of the malignant causes, non-small cell lung cancer accounts for approximately 50% of the cases, small cell lung cancer for 25%, and lymphoma and

metastatic cases for 10% each. Management varies according to the cause. In malignant conditions, management involves both treatment of the cancer and relief of the symptoms and obstruction. Median life expectancy varies with the underlying condition, and is approximately six months in some cancer patients. On the other hand, in some patients, treatment of SVC syndrome and the malignant conditions results in the cure of both. Treatment is usually palliative, and can include radiotherapy, chemotherapy, stent graft placement, and pharmacomechanical thrombolysis with or without angioplasty.^[6-9] Silent SVC syndromes (as in

our case) should be remembered before pacemaker implantations. In our case, although CT scanning showed a large right-sided upper lobe pulmonary solid mass, which caused a mass effect to the SVC, there was no clinical sign of SVC syndrome or of collateral venous formation.

When patients present with SVC syndrome or without SVC syndrome but having a large right-sided pulmonary mass, special attention should be given before permanent pacemaker implantation. Decision of pacemaker placement should be discussed in detail, and epicardial pacemaker implantation or alternatively pacemaker implantation via the femoral vein should be considered in such cases.^[10,11]

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Key words: Lung neoplasms/complications; pacemaker, artificial; superior vena cava syndrome/diagnosis/therapy; vena cava, superior/anatomy & histology.

Anahtar sözcükler: Akciğer neoplazisi/komplikasyon; kalp pili; superior vena cava sendromu/tanı/tedavi; vena cava, superior/anatomisi ve histoloji.