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Internal Mammary Artery To Lung Parenchyma Fistula After Mediastinitis Following Graft Replacement of the Ascending Aorta

Asendan Aort Greft Replasmanını Takiben Mediastinit Sonrası İnternal Mammarian Arter İle Akciğer Parankimi Arasında Fistül

Radyoloji

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Özet

Postoperatif akciğer parankimine internal mammarian arter fistülizasyonu, kardiyak cerrahinin çok nadir ve ölümcül bir komplikasyonudur. Bu fistülizasyon, sıklıkla yüksek mortalite ve morbidite oranları ile ilişkili masif veya aralıklı hemoptizi ile sonuçlanmaktadır. Perkutan transkateter emboloterapi, vasküler fistüllerin tedavisinde, etkin ve güvenli bir seçenektir. Biz, bu yazımızda, asendan aort replasmanını takiben mediastinit sonrası akciğer parankimine internal mammarian arter fistülünün embolizasyonunu sunduk. Hastanın dört aylık izleminde hemoptizi tekrarlamadı.

Anahtar kelimeler: *Fistül, İnternal mammarian arter Akciğer Kardiyak cerrahi*

Abstract

Postoperative internal mammary artery fistulization to lung parenchyma is a very rare and fatal complication of cardiac surgery. This fistulization with nonbronchial collateral arteries frequently results in massive or intermittent hemoptysis with associated high rates of morbidity and mortality. Percutaneous transcatheter embolotherapy is an effective and safe option in the treatment of vascular fistulas. We report embolization of an internal mammary artery to lung parenchyma fistula after mediastinitis following graft replacement of the ascending aorta and after a follow-up of 4 months, hemoptysis had not recurred.

Keywords: *Fistula, Internal mammary artery Lung Cardiac surgery*

Introduction

Nonbronchial systemic arterial fistulas such as the internal mammary artery (IMA) into the bronchial tree and lung parenchyma are uncommon vascular abnormalities. and may develop in any time period after surgery [1]. Hemoptysis with associated high rates of morbidity and mortality., whether massive or intermittent, represents the most common symptom [2]. Massive hemoptysis is a potentially life-threatening respiratory emergency. Embolotherapy has become an accepted procedure for controlling massive or recurrent hemoptysis, especially in patients who have limited pulmonary reserve and are not surgical candidates [3]. We present a case of 32 years old male with IMA fistula draining to lung parenchyma in which embolotherapy was performed successfully.

Case Report

A 32-year-old man who underwent redo Cabrol aortic root repair after mediastinitis following graft replacement of the ascending aorta 1 month before was developed a massive hemoptysis on postoperative second weeks. He had a history of interposition graft for ascendan aortic aneurysm 5 year before. The patient presented with acute massive bleeding of greater than 240 mL/d in first episode. Two days later, the patient had a second episode of hemoptysis of over 100 mL during four days. On physical examination, vital signs of relevance are arterial blood pressure: 125/65mmHg, heart rate: 85 bpm and regular, normal respiratory rate and 98% SpO2 on room air. The review of laboratory values reveals that the hemoglobin is 12.5 g/dL. The platelet count is 245 x 10^9/L and other laboratory values and clotting tests are within normal limits. Electrocardiography did not show any abnormality.

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Chest x-ray showed no significant findings. Tromboelastogram tests was performed and decreased clot strenght was determined platelet transfusion and fibrinogen supplementation were applied together with supplemental oxygen and fluid resuscitation. Computerized tomography (CT), and flexible broncoscopy examinations were used to lateralize the bleeding side and identify the cause of hemoptysis for medically uncontrollable hemoptysis. The source of hemoptysis was not visualize by bronchoscopy.

The thoracic CT was inadequate determine the cause of the haemoptysis. Then, transaxillary subclavian arteriography was performed under local anesthesia using selective 4F diagnostic catheter. Selective angiography of the right IMA revealed aberrant bronchial side branches, which probably caused the upper lobe hemorrhage (Figure 1).

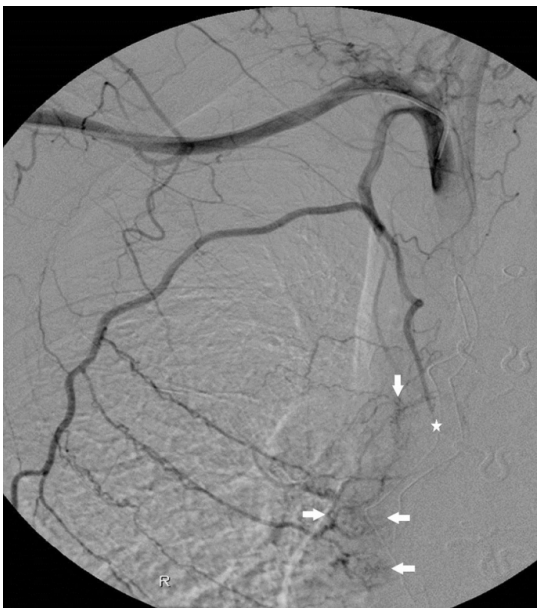

Figure 1

Major haemoptysis in a 32-year-old man with a past history of mediastinitis following Cabrol's graft replacement: Selective catheterisation of the right subclavian artery revealing a revascularization of collateral artery from proximal part of IMA and multiple abnormal arteries feeding a vascular blush (white arrows). The right IMA was seen totally occluded at mid-segment (asteriks).

Also the angiography showed total occlusion of middle segment of the IMA. Polyvinyl alcohol particles (250-355 microns) were injected to embolize an abnormal vascular network originating from the proximal part of the IMA. The proximal part of IMA was embolized with coils until the flow ceased completely (Figure 2).

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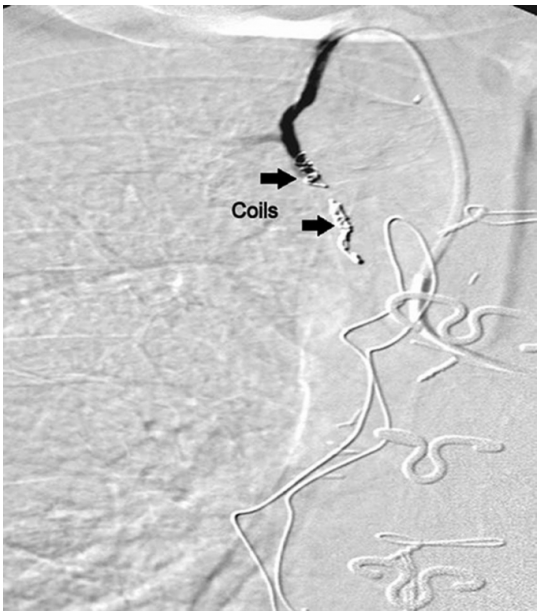

Figure 2

Selective arteriogram obtained after embolization using polyvinyl alcohol particles and coils shows complete embolization of the nonbronchial systemic collateral artery and the proximal part of the right IMA (black arrows).

After a follow-up of 4 months, hemoptysis had not recurred.

Discussion

Haemoptysis accounts for 10 to 15% of all admissions in pneumology. It requires emergency care in a specialised environment. In fact, in spite of this care, death due to major haemoptysis ranges from 50 to 100% even after surgical haemostasis [4].

The source of massive hemoptysis is usually the bronchial circulation (90% of cases) rather than the pulmonary circulation (5%) [5]. In a minority of cases (5%), massive hemoptysis may originate with the aorta (eg, aortobronchial fistula, ruptured aortic aneurysm) or the systemic arterial supply to the lungs [2,3]. In our case, the source of massive hemoptysis is the non-bronchial systemic collateral artery which caused by fistulization between the right IMA and lung parenchyma.

A history of previous cardiac or aortic operations is highly suggestive of aortobronchopulmonary fistulas [6]. The nature of the underlying cardiac surgery and risk factors associated surgery, in particular age and redo cardiac surgery, are important factors in treatment decision-making. Because our case has three times a history of ascending aortic surgery and mediastinitis, the cause of hemoptysis may be related to factors such as trauma, infection and inflammation due to the surgical procedure.

Embolotherapy is an established procedure widely used in the treatment of patients with moderate to massive hemoptysis, especially in patients who have limited pulmonary reserve and are not surgical candidates. However, it is important to identify and embolise all vessels that may contribute to an abnormal vascular replacement [7]. Rebleeding is sometimes attributed to recanalization of the embolized vessels, new collateral circulation from surrounding vessels, incomplete embolization, or progression of the basic disease [8].

We believe the current case aids to attract the attention to this rare and unusual fistulization. Repetetive trauma

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and inflamation due to redo heart surgery are an important risk factor in the devolopment of haemoptysis. Percutaneous approach is an increasing option widely used in the treatment of haemoptysis. In fact, embolotherapy is the only treatment for inoperable or high risk patients. We conclude that embolization of nonbronchial systemic collateral arteries with percutaneous approach is safe and effective treatment of patients with massive and moderate hemoptysis.

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