DOI: 10.4274/anatoljmed.2022.87360
Anatol J Gen Med Res 2024;34(1):106-9

CASE REPORT / OLGU SUNUMU

ANATOLIAN JOURNAL of GENERAL MEDICAL RESEARCH

Concurrent Percutaneous Intervention for Simultaneous Acute Myocardial Infarction and Acute Bifurcated Graft Thrombosis of Lower Extremities

Akut Bacak İskemisi ve Akut Miyokard Enfarktüsü için Eş Zamanlı Perkütan Girişim

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Cite as: Çelik İE, Öztürk S, Yarlıoğlu M, Duran M, Murat SN. Concurrent Percutaneous Intervention for Simultaneous Acute Myocardial Infarction and Acute Bifurcated Graft Thrombosis of Lower Extremities. Anatol J Gen Med Res 2024;34(1):106-9

Abstract

Acute limb ischemia (ALI) is a medical emergency associated with high morbidity, significant disability, and life-threatening complications. Acute myocardial infarction (AMI) with concurrent ALI is a challenging clinical condition associated with adverse events including mortality and requires immediate simultaneous reperfusion. We present the case of a patient with a history of bifurcated graft operation due to abdominal aortic aneurysm six years ago who presented with inferior ST-elevation AMI and acute bifurcated graft thrombosis of the lower extremities causing ALI. The patient was successfully treated with simultaneous percutaneous coronary and peripheral revascularization. We emphasize that AMI and ALI may occur simultaneously, and concurrent percutaneous revascularization can be a safe and feasible treatment strategy in such patients.

Keywords: Acute limb ischemia, acute myocardial infarction, percutaneous revascularization

Öz

Akut bacak iskemisi (ALI), yüksek morbidite, önemli sakatlık ve yaşamı tehdit eden komplikasyonlarla ilişkili tıbbi bir acil durumdur. Akut miyokard enfarktüsüne (AMI) eşlik eden eş zamanlı ALI ise yüksek morbidite ve ölüm ile ilişkili olan ve en kısa sürede eş zamanlı reperfüzyon gerektiren zorlu bir klinik durumdur. Biz bu olguda abdominal aort anevrizması nedeniyle bifürkasyon greft operasyonu öyküsü olan ve alt duvar AMI'ye eşlik eden ALI kliniği ile başvuran bir hastayı sunmayı amaçladık. Hasta eş zamanlı olarak perkütan koroner ve periferik revaskülarizasyon ile başarılı bir şekilde tedavi edildi. AMI ve ALI aynı anda ortaya çıkabilir ve bu gibi durumlarda eş zamanlı perkütan revaskülarizasyon güvenli ve uygulanabilir bir tedavi yöntemidir.

Anahtar Kelimeler: Akut bacak iskemisi, akut miyokard enfarktüsü, perkütan revaskülarizasyon

Introduction

Acute limb ischemia (ALI) is an emergent condition that threatens the viability and functionality of the extremities[1]. To improve ischemia and associated morbidity and mortality, prompt diagnosis and an early approach to this clinical entity is essential. ALI most commonly originates from an acute thrombotic occlusion or thromboembolism related to atrial fibrillation, left ventricle, heart valves, etc.[2]. Therapeutic options include endovascular or surgical interventions

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Received/Geliş tarihi: 11.04.2022
Accepted/Kabul tarihi: 23.10.2022

such as local thrombolysis, percutaneous thrombectomy, stenting, angioplasty, or bypass. ALI with concomitant acute myocardial infarction (AMI) is an uncommon presentation and rarely reported in the literature[3,4]. Herein, we present the case of a patient who presented with inferior ST-elevation AMI and acute split graft thrombosis of the lower extremities causing ALI that was successfully treated with simultaneous percutaneous coronary and peripheral revascularization.

Case Report

A 56-year-old male patient complaining of retrosternal chest pain that started 3 h ago, followed by sudden onset of pain, numbness, and coldness in the lower extremities, was admitted to the emergency department (ED). His anamnesis revealed a smoking history and bifurcated graft operation because of an abdominal aortic aneurysm six years ago. Initial evaluation of vital signs demonstrated a blood pressure of 80/50 mmHg and a heart rate of 96 beats per minute. Auscultation of the cardiovascular system demonstrated 2/6 systolic murmur at the apex. There were no arterial pulses in his right lower extremity, and the left lower extremity arterial pulses were diminished. Neurological evaluation of the lower extremities was consistent with bilateral sensory and motor loss and an accompanying dropped foot in the right lower extremity. The electrocardiogram obtained in the ED showed elevation of the ST segment in inferior leads and ST segment depression in reciprocal lateral leads. Bedside transthoracic echocardiography revealed inferior wall hypokinesis with no thrombus in the heart chambers. Creatinine kinase-MB and troponin T peaked at 312 U/L and >10.000 ng/mL, respectively. The patient was preloaded with acetylsalicylic acid and ticagrelor, and heparin was intravenously administered. The patient was then transferred to the catheterization laboratory for primary percutaneous coronary intervention (PCI) through the left radial route. Conventional peripheral angiography was also planned for evaluating ALI. Coronary angiography demonstrated subtotal thrombotic occlusion of the left circumflex (LCx) artery and plaque in the proximal left anterior descending artery (Figure 1A). An angiogram of the right coronary artery also noted a critical lesion in the proximal segment. Aortoiliac angiography demonstrated total occlusion of the right common iliac artery (CIA) and subtotal thrombotic occlusion of the left CIA (Figure 2A). Thus, consecutive intervention for LCx artery and bifurcated graft thrombosis was planned. Initially, a 3.0 18-mm Xience PRIME™ stent (Everolimus drug-eluting stent, Abbott, USA) was successfully deployed into LCx (Figure 1B). Percutaneous transluminal angioplasty (PTA) was planned for both CIA. A guidewire was advanced across the lesions in an antegrade manner, and balloon angioplasty of the right CIA was performed with a 6x200 mm balloon (EverCross™ 0.035 OTW PTA dilatation catheter, Medtronic, USA) (Figure 2B). Then, balloon angioplasty of the left CIA was performed with an 8.0x40 mm balloon (EverCross™ 0.035" OTW PTA dilatation catheter, Medtronic, USA) (Figure 2C). Control arteriography demonstrated reperfusion of both arteries (Figure 2D). Abciximab therapy was administered, and the patient tolerated the procedures well without any complications. The leg pain of the patient improved, and peripheral arterial pulses became palpable immediately after the procedure. During the intensive care unit follow-up, the patient maintained a stable hemodynamic state and remained asymptomatic. Five days after admission, he was discharged home with an ambulatory status. Ultrasonographic examination performed during the outpatient follow-up did not reveal any thrombus images in the aortic and iliac arteries. Furthermore, the hematological examination did not reveal any pathology. At the end of two years, he did not experience any vascular or coronary events. Written informed consent was obtained from the patient.

Discussion

There have been tremendous improvements in the interventional cardiology era in recent decades, and percutaneous interventions have been the mainstay of treatment in acute thrombotic occlusions. Thanks to these improvements, even complex cases can be successfully managed with percutaneous approaches in both coronary

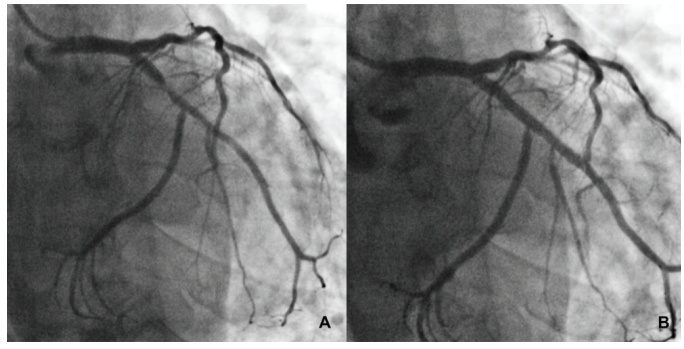

Figure 1. A. Coronary angiography of the patient demonstrating subtotal thrombotic occlusion of the left circumflex artery. **B.** Successful deployment of 3.0x18 mm Xience PRIME™ stent (Everolimus drug-eluting stent, Abbott, USA) resulting in TIMI-3 flow in the left circumflex artery

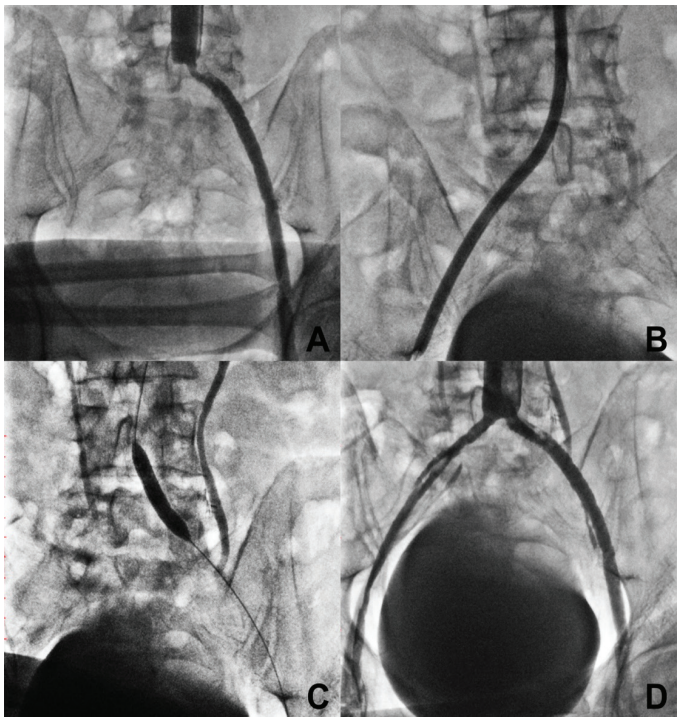

Figure 2. A. Aortoiliac angiography of the patient demonstrating occlusion of the proximal right common iliac artery (CIA) and subtotal thrombotic occlusion of the proximal left CIA. **B.** Balloon angioplasty of the occluded right CIA with a 6x200 mm balloon (EverCross™ 0.035" OTW PTA dilatation catheter, Medtronic, USA). **C.** Balloon angioplasty of the left CIA with an 8.0x40 mm balloon (EverCross™ 0.035" OTW PTA dilatation catheter, Medtronic, USA). **D.** Aortoiliac angiography after percutaneous angioplasty of the right and left CIAs

and peripheral arteries. To the best of our knowledge, this is the first case report in the literature presenting with simultaneous acute bifurcated graft thrombosis of the lower extremities and AMI successfully treated with percutaneous intervention in the same session.

ALI is a severe condition associated with high morbidity, significant disability, and life-threatening complications[1,5]. Thrombotic obstructions and emboli are the most common causes of ALI. Atrial fibrillation, ventricular thrombus after MI, and valvular heart disease are the most common causes of embolism. Thrombotic obstructions related to atherosclerotic progression and thrombosis *in situ* arising from hypotension, hypovolemia, hyperviscosity, acute plaque rupture, or malignancy are other causes of acute occlusion[2]. In contrast, simultaneous occurrence of AMI and ALI is an extremely rare and challenging clinical situation that may be associated with adverse events, including mortality[3,4,6]. In this case, the mechanism of bifurcated graft thrombosis of the lower extremities that causes ALI could be thrombosis *in situ* that could arise from hypotension following AMI. The patient initially described chest pain and then complained of sudden onset of pain in the bilateral lower extremities. In addition, his blood pressure was 80/50 mmHg at admission. Therefore, we hypothesized that the factor predisposing the patient to acute thrombosis in the bifurcated graft may be hypotension following AMI.

AMI with concurrent ALI is a challenging clinical condition that can be associated with high morbidity and mortality and requires simultaneous reperfusion as soon as possible. Although there are many therapeutic alternatives, such as hybrid surgery after PCI or local thrombolysis, we decided to treat the patient with simultaneous percutaneous revascularization by stenting LCx and subsequent angioplasty of the iliac arteries. It should be acknowledged that advances in interventional cardiology have led operators to consider percutaneous revascularization as the first-line therapeutic strategy when compared with other treatment approaches, even in complex and challenging cases such as ours.

In conclusion, AMI and acute bifurcated graft thrombosis of the lower extremities causing ALI might occur simultaneously, and concurrent percutaneous revascularization can be a safe and feasible treatment strategy in such patients.

Acknowledgements: This case report was presented at 35th Turkish Cardiology Congress with International Participation as oral presentation.

Ethics

Informed Consent: Written informed consent was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices: İ.E.Ç., S.Ö., M.D., S.N.M., Concept: İ.E.Ç., S.Ö., M.D., S.N.M., Design: İ.E.Ç., S.Ö., M.Y., M.D., S.N.M., Data Collection or Processing: İ.E.Ç., S.Ö., M.Y., M.D., S.N.M., Analysis or Interpretation: İ.E.Ç., S.Ö., M.Y., M.D., S.N.M., Literature Search: İ.E.Ç., S.Ö., M.Y., S.N.M., Writing: İ.E.Ç., S.Ö., M.Y., S.N.M.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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