

Iatrogenic Multivessel Coronary Artery Dissection: Surgical Management After Stenting in a Postmenopausal Woman: Case Report

İyatrojenik Multidamar Koroner Arter Diseksiyonu: Postmenopozal Bir Kadında Stentleme Sonrası Cerrahi Müdahale

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ABSTRACT Iatrogenic acute dissection of the coronary arteries during percutaneous coronary interventions is one of the most important complications of this procedure. It occurs rarely, but has high risk of mortality and morbidity. Its incidence has increased recently due to increased number of percutaneous interventions. Extensive dissections require immediate diagnosis and treatment. The ideal management of acute coronary dissection is to maintain the normal coronary blood flow and reduce or prevent myocardial damage by blocking the extension of dissection. Here, we report a case of iatrogenic coronary dissection extending into the left anterior descending and circumflex coronary artery successfully treated with coronary artery bypass grafting.

Key Words: Coronary vessels; angioplasty, balloon, coronary; complications

ÖZET İyatrojenik akut koroner arter diseksiyonu perkütan koroner arter girişimleri sırasında meydana gelebilen, bu girişimlere ait en önemli komplikasyonlardandır. Bu durum, nadir olarak ortaya çıkar, ancak yüksek morbidite ve mortaliteye sahiptir. Perkütan koroner arteriyel girişimlerin günümüzde daha sık uygulanmasına bağlı olarak iyatrojenik koroner arter diseksiyon insidansında artış görülmüştür. Yaygın diseksiyon durumunda acil tanı ve tedavi gerekir. Akut koroner diseksiyonlarda ideal tedavi diseksiyonun neden olduğu blokajın önlenmesi ve bu sayede miyokard hasarı oluşumundan kaçınılması ve normal koroner akımın sağlanmasıdır. Biz, koroner arter baypas cerrahisi ile tedavi edilen, sol ana koroner arter ve sirkumfleks koroner artere uzanan iyatrojenik bir koroner diseksiyon vakasını bildiriyoruz.

Anahtar Kelimeler: Koroner damarlar; anjiyoplasti, balon, koroner; komplikasyonlar

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Percutaneous coronary interventions (PCI) are very frequently employed in the treatment of coronary artery disease. The efficacy and safety of the procedure have been proved in many report series, but serious complications can still occur such as iatrogenic coronary artery dissection (ICAD). This can be called catheter-induced coronary dissection. It is a rare complication but has a significant mortality and morbidity. Following diagnosis, the treatment must be immediately done with coronary artery stenting or emergent surgery. The ideal management of acute coronary dissection is to maintain the normal coronary blood flow and reduce or prevent myocardial damage by blocking the extension of dissection. Several treatment strategies have been reported with varying

success rates, but still there is a controversy due to small numbers of cases.^{1,2}

CASE REPORT

A 49-year-old female patient was admitted to our hospital with chest pain. She was referred to Cardiology department for further investigation of recent-onset effort angina. On admission she was free of symptoms at rest and she had a normal clinical examination. She also had a normal chest X-ray and laboratory tests yielded no unusual findings besides altered lipoprotein levels. The patient was then subjected to coronary angiography. Coronary angiography demonstrated absence of atherosclerotic lesions. The first injection of the left anterior descending artery (LAD) revealed a long discrete flap of dissection in the juxta-ostial segment (Figure 1a, Video 1). The patient experienced severe chest pain immediately. The second injection in the left coronary artery revealed an extension of the dissection towards the mid-portion of the artery. Stenting was performed for dissecting portions (Figure 1b).

Following coronary angiography, on the second day the patient complained of severe acute chest pain. She was taken to angiography laboratory and angiography revealed dissection of the proximal circumflex coronary artery (Figure 1c, Video 2). Emergent surgical revascularization was planned and patient was taken to the operating room. The blood pressure was 110/65 mm Hg and heart rate was 110/min. The patient was hemody-

namically stable, so intra-aortic balloon pump was not inserted. Left anterior descending artery and first obtuse marginal artery were bypassed on-pump with saphenous vein grafts. The postoperative course was uneventful. The patient stayed in the intensive care unit for 2 days and was discharged on fifth postoperative day.

DISCUSSION

Coronary angiography is the gold standard technique for diagnosis of coronary artery disease and is widely used in current clinical practice. Complications are very rare, but still occur which are mostly very serious. One of these complications is the coronary artery dissection. Catheter-induced dissection of a coronary artery is uncommon, but has a high mortality rate.¹⁻⁴

There are many mechanisms that can cause ICAD, but the subject is still not clear. Iatrogenic coronary artery dissection is more common in women so it may have a hormonal basis.⁵ It can be affected by injection of contrast material, handling of catheters, guide-wires, balloons and stents. Atherosclerotic arteries are more fragile to mechanical forces and dissection can occur easily in these circumstances. The dissection can extend in antegrade direction and impair coronary blood flow. It can also extend retrogradely and cause aortic dissection.¹⁻⁴

The treatment strategy is a challenging subject, because these cases are very rare and present as emergencies. The treatment option depends on

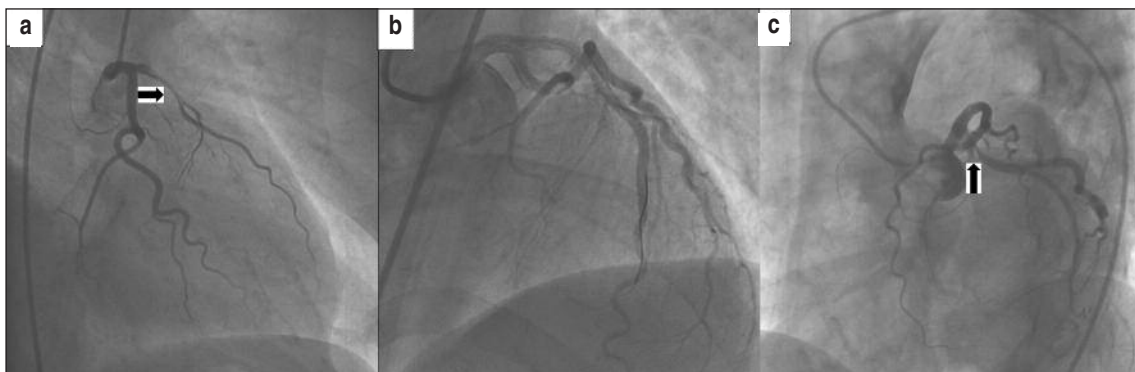


FIGURE 1: a) Dissection flap was observed on the first injection of proximal LAD (arrow). b) Left anterior descending artery was stented successfully. c) The proximal segment of circumflex coronary artery was dissected (arrow).

the clinical status of the patient, localization of the dissected area, the number of vessels involved and the coronary flow status. Early diagnosis and treatment are necessary to maintain coronary blood flow and reduce or prevent myocardial ischemia.⁵

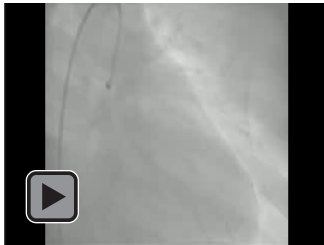
There are two main treatment strategies in iatrogenic coronary dissections. The approach is similar to spontaneous coronary artery dissections.^{6,7} Medical treatment and stenting are usually sufficient to achieve this complication especially in limited dissections but sometimes surgical treatment is needed. In most of the recent studies it is reported that surgery should be done in case of failure of other revascularization techniques or to assist circulation in the most severe cases. Extensive dissections with pericardial extravasation require immediate and more aggressive treatment. But in current practice, this complication is mostly treated by coronary stents. In a series of 13 patients who had iatrogenic left main coronary artery dis-

section, bail-out stent procedure was employed in 11 cases, only two patients were operated. One mortality in each group was noted. In the same report, cases from Pubmed Database were also evaluated and it was reported that 32 out of 36 patients were successfully treated with bail-out stenting.⁸ If coronary interventions do not work out, emergency coronary artery bypass grafting is an effective procedure and can be safely performed. Surgery must be done quickly to reduce the risk of myocardial ischemia and damage.^{2,4} Retrograde dissection and impaired blood flow to circumflex artery (due to dissection or due to stent placed in left main coronary artery) are also indications for surgery even in stable hemodynamics.⁸

In conclusion, in ICAD cases, PCI is effective at the time of diagnosis to maintain coronary perfusion and hemodynamic stability. Surgery should be done in cases where coronary intervention has failed or impossible.

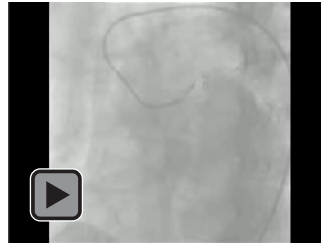
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Video 1

The coronary angiography performed on first admission of the patient. The first injection of LAD revealed dissection of the proximal segment..



Video 2

The second angiography was performed after two days due to new onset angina. The proximal portion of circumflex coronary artery is dissected.