Successful stenting of a spontaneous right coronary artery dissection

Spontan sağ koroner arter diseksiyonuna başarılı stent uygulaması

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Spontaneous coronary artery dissection is a rare cause of acute coronary syndrome. A 46-year-old male patient presented with manifestations of acute coronary syndrome. He underwent coronary angiography because of angina unresponsive to medical therapy. A spontaneous right coronary artery dissection was detected during coronary angiography. Distal flow was assessed as TIMI-0-I. A coronary stent, 4.0x15 mm in size was implanted, after which the dissection disappeared and the distal flow became normal.

Key words: Aneurysm, dissecting/complications; coronary angiography; coronary disease/complications; coronary vessels/pathology.

Spontan koroner arter diseksiyonu akut koroner sendromun nadir bir nedenidir. Kırk altı yaşında bir erkek hasta akut koroner sendrom kliniğiyle hastanemize başvurdu. Hastaya tıbbi tedaviye karşın devam eden göğüs ağrısı nedeniyle koroner anjiyografi yapıldı. Koroner anjiyografide sağ koroner arterde orta bölgede spontan diseksiyon saptandı. Distal akım TIMI–0-I olarak değerlendirildi. Spontan sağ koroner arter diseksiyonuna 4.0x15 mm stent yerleştirildi. Koroner arterdeki diseksiyon düzeldi ve distal akım normale döndü.

Anahtar sözcükler: Diseke anevrizma/komplikasyon; koroner anjiyografi; koroner hastalık/komplikasyon: koroner damar/patoloji.

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome and sudden death. It may occur in young people and pregnant women and is frequently identified on postmortem examination. We report a male patient who presented with manifestations of acute coronary syndrome due to a spontaneous dissection of the right coronary artery (RCA).[1-4]

CASE REPORT

A 46-year-old male presented to our hospital with substernal chest pain associated with shortness of breath and nausea of one-week duration. The patient denied chest trauma, fever, or chills. He had a family history of coronary artery disease, hypercholesterolemia, and smoking as coronary risk factors, but he had not developed any cardiac disease before. Electrocardiography showed an ST depression of 2 mm in leads V4 and V6. Despite treatment with aspirin, heparin, nitroglycerin, beta-blocker, and tirofiban, his chest pain was not relieved. The patient's age was regarded as a TIMI risk parameter, so he was taken to the cardiac catheterization laboratory for further treatment. Selective coronary angiography revealed normal flow in the left main coronary artery. There were critical lesions at the second diagonal bifurcation of the left anterior descending (LAD) coronary artery and in the circumflex artery (Cx). In addition, a large SCAD (35 mm) was detected in the RCA beginning just distal to the right ventricular branch of the RCA and distal TIMI flow grade 0-I (Fig. 1a, b). Left ventriculography showed akinesia of the posterior wall, with an ejection fraction of 60%. Laboratory studies did not show any elevation in cardiac specific troponins and creatine phosphokinase. The patient refused surgery and the dissection was treated by coronary stenting (4.0 mm x

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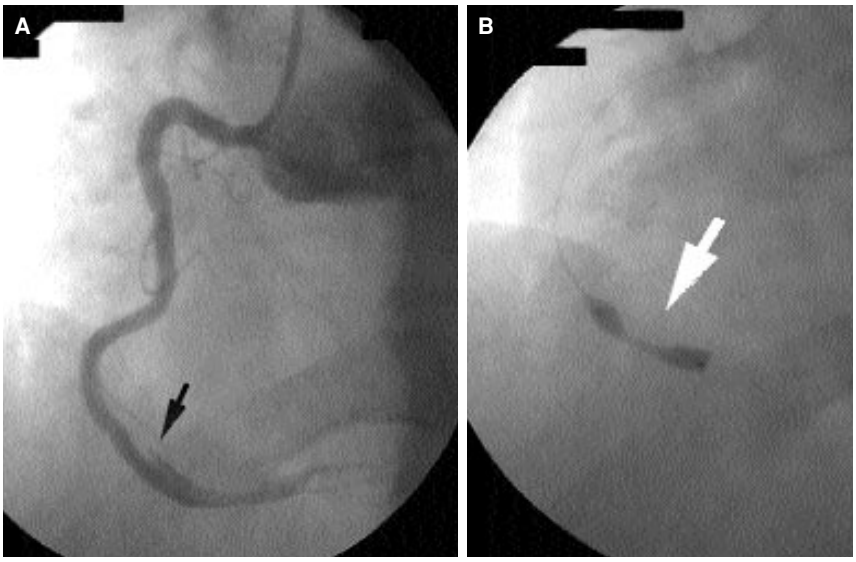

Fig. 1. (A, B) Coronary angiography revealed a spontaneous distal right coronary artery dissection in a smooth-contour vessel. The white arrow shows the site of dissection and late clearance of radio contrast substance.

15 mm, Ephesos, Nemed Corp, Istanbul, Turkey) after which the dissection disappeared and distal flow became normal (Fig. 2). The LAD lesion at the second diagonal branch was also successfully treated by a Taxus stent (Boston Scientific, USA). There were many lesions in the Cx artery, but they were treated by medical follow-up due to extreme tortiosity. The patient was in good condition and asymptomatic for a week.

Fig. 2. The right coronary artery was cannulated using a 6 F Judkins right guide catheter. Direct stenting of the lesion was performed uneventfully. The arrow shows the stent opening and disappearance of the dissection.

DISCUSSION

Spontaneous coronary artery dissection is a rare angiographic finding. It may cause acute coronary syndrome and sudden cardiac death.[1-3] The exact etiological mechanism of SCAD remains unclear. There is a female preponderance and tendency to occur in pregnancy, making a hormonal influence likely.[1-3] Some case reports suggested a possible relationship between peripartum heart disease (myocarditis and SCAD) and the presence of eosinophils in the adventia of the dissected vessels, and in the myocardium in cases of myocarditis and/or cardiomyopathy.[4] Vasculitis and cystic medial necrosis have been implicated in the etiology of this condition; it is also reported in patients with Marfan's syndrome and Ehlers-Danlos syndrome and in association with hypertrophic cardiomyopathy with rheumatic valve disease and autoimmune thyroiditis, and with isolated fibromuscular dysplasia.[2-6] Relationship with exercise and occurrence in elderly subjects have also been reported.[6]

The most common localization of involvement is the LAD artery (80%) followed by the RCA; in a few cases the left Cx artery may be affected.[5,7,8] Dissections of the RCA may result in an uncomplicated acute myocardial infarction. It is difficult to estimate the exact prevalence of RCA dissections because therapeutic choices of acute coronary syndromes vary and early conservative strategies that defer angiography may overshadow the diagnosis. It is likely that, because of spontaneous healing,

many cases of SCAD may appear angiographically as an atherosclerotic disease if angiographic study is not performed soon after acute myocardial infarction.[9]

Angiography is the gold standard in the diagnosis of SCAD; however, other imaging techniques such as computed tomography, magnetic resonance imaging, intravascular ultrasound, and transesophageal echocardiography may be helpful in both the diagnosis and follow-up.[7-10]

The treatment for SCAD has not been well defined. In some patients, complete spontaneous healing with or without recurrence of dissection has been reported.[7,9] Coronary angioplasty and stenting may be a therapeutic option; it has been performed in a few patients with good results and long-term patency.[7-10] Although drug-eluting stents might be a therapeutic choice, there is no information on the use of these stents in SCAD patients. Coronary artery bypass grafting has also been used successfully. The aim of surgical treatment is to restore blood flow to the true lumen and to obliterate the false lumen. Both saphenous vein grafts and internal mammary artery grafts have been used with excellent results.[7-10] Conventional medical treatment including aspirin, nitrates, calcium channel blockers, and beta-blockers have been reported to be successful in SCAD patients.[3] However, it is not clear whether these agents improve prognosis, prevent recurrence, or enhance spontaneous healing of arterial dissections.[3]

The decision whether to treat SCAD medically or surgically has not been clearly defined.[2] For patients with a left coronary arterial dissection and those who remain symptomatic, it is easier to draw a decision for coronary artery bypass grafting or mechanical revascularization (percutaneous transluminal coronary angioplasty and stenting); however, this is somewhat difficult in those who have already completed their infarction and are asymptomatic,[7-10] because these patients may do well with medical therapy.[2,4,6]

Our patient was a young male with three risk factors for coronary artery disease. Initially, he had been treated for an ordinary acute coronary syndrome until angiography showed extensive coronary atherosclerosis suggesting three vessel disease, spontaneous dissection or aneurysmal dilatation of the RCA. The dissection was attributed to severe atherosclerosis for severe inflammation, erosion or rupture of the vulnerable plaque may progress to SCAD.[9]

What was confounding in our patient was that no elevation of cardiac enzymes were observed despite persistent chest pain and angiographic evidence for myocardial akinesia. When the RCA is occluded, coronary circulation will be redistributed to the LAD and Cx regions and the distal of the RCA dissection will be supplied by a retrograde flow during chest pain. After the disappearance of the spasm and occlusion at the dissection, coronary circulation will be reestablished. This phenomenon may account for the absence of cardiac enzyme elevations.

REFERENCES

1. Papadopoulos DP, Moyssakis I, Perakis A, Athanasiou A, Anagnostopoulou S, Benos I, et al. Acute myocardial infarction due to spontaneous dissection of the right coronary artery in a young male. Cardiovasc Intervent Radiol 2004;27:536-7.
2. Bac DJ, Lotgering FK, Verkaaik AP, Deckers JW. Spontaneous coronary artery dissection during pregnancy and post partum. Eur Heart J 1995;16:136-8.
3. Bateman AC, Gallagher PJ, Vincenti AC. Sudden death from coronary artery dissection. J Clin Pathol 1995; 48:781-4.
4. Borczuk AC, van Hoeven KH, Factor SM. Review and hypothesis: the eosinophil and peripartum heart disease (myocarditis and coronary artery dissection)-coincidence or pathogenetic significance? Cardiovasc Res 1997;33:527-32.
5. Lee TM, Liau CS. Spontaneous coronary artery dissection in an elderly woman with acute inferior myocardial infarction. A case report. Angiology 1995;46:847-51.
6. Shah SH, Sketch MH Jr, Tcheng JE. Acute myocardial infarction in a young male while playing paintball. J Invasive Cardiol 2002;14:713-5.
7. Gonzalez JI, Hill JA, Conti CR. Spontaneous coronary artery dissection treated with percutaneous transluminal angioplasty. Am J Cardiol 1989;63:885-6.
8. Klutstein MW, Tzivoni D, Bitran D, Mendzelevski B, Ilan M, Almagor Y. Treatment of spontaneous coronary artery dissection: report of three cases. Cathet Cardiovasc Diagn 1997;40:372-6.
9. Celik SK, Sagcan A, Altintig A, Yuksel M, Akin M, Kultursay H. Primary spontaneous coronary artery dissections in atherosclerotic patients. Report of nine cases with review of the pertinent literature. Eur J Cardiothorac Surg 2001;20:573-6.
10. Baker CS, Knight C, Deaner A. Images in cardiology: Spontaneous right coronary artery dissection. Heart 2002;88:130.