Radiofrequency ablation improving LV function in cardiomyopathy secondary to low burden of premature ventricular complexes

Erken ventrikül komplekslerinin düşük oranına bağlı kardiyomiyopatide radyofrekans ablasyon sol ventrikül fonksiyonunu düzeltiyor

Nasir Shariff, Daniel Makowski*, Vadim Levin
Department of Cardiovascular Medicine and
***Department of Medicine, Lehigh Valley Health Network,**
Pennsylvania-*USA*

Introduction

Radiofrequency ablation (RFA) has been recognized to improve outcome in patients with cardiomyopathy induced by a high burden of premature ventricular complexes (PVCs). It is not clear if further reduction of the PVC load in patients with low burden will improve the left ventricular (LV) function.

Case Report

A 58-year-old man presented with breathlessness and chest discomfort. Stress test demonstrated an area of ischemia in the inferolateral wall. Coronary angiogram showed a stenosis of left circumflex artery (LCA), which was stented. He was discharged on appropriate medications. At one-year follow-up, he had increasing breathlessness and palpitations. Electrocardiogram noted of sinus rhythm with PVCs (Fig.1). Echocardiogram showed an LV ejection fraction (EF) of 35% (60% a year prior). The LV end -systolic diameter (LVSD) was 4.9 cm and end-diastolic diameter (LVDD) was 6.1 cm. No other attributable causes for the deterioration such as alcohol abuse or viral illness were present. Holter monitor noted a PVC burden of 5120 (6%). Holter monitoring 2 months later noted a PVC burden of 9700 (11%). Coronary angiogram showed non-obstructive disease with patent stent. Considering the symptoms, PVC burden and reduction in LVEF, without an alternative etiology, a diagnosis of PVC induced cardiomyopathy was made. Medications used for PVCs in patients with heart failure and coronary disease are associated with worse outcome (1), a plan for RFA was taken. 3D reconstruction was performed with intracardiac echo Cartosound technique (Biosense Webster, Diamond Bar, CA). The PVC was targeted utilizing activation and pace mapping techniques. The best pace map was just below left main coronary artery in the left coronary cusp (Fig. 2). Angiogram was performed to identify the coronary arteries, to maintain safe distance of the ablation lesions. A 7F irrigated RFA catheter (Thermocool, Biosense Webster, Diamond Bar, CA) with 3.5 mm tip was used. RFA power was applied at 45 Watts with temperature control set at <40°C. The clinical PVC was terminated with the third lesion; two further ablations were delivered to secure complete ablation.

At 1 month following the procedure, Holter study noted of only 6 PVCs. Echocardiogram showed LVEF of 50% with LVSD of 3.8 cm, and LVDD of 5.4 cm. One year since his ablation procedure, he has had remarkable improvement in his symptoms.

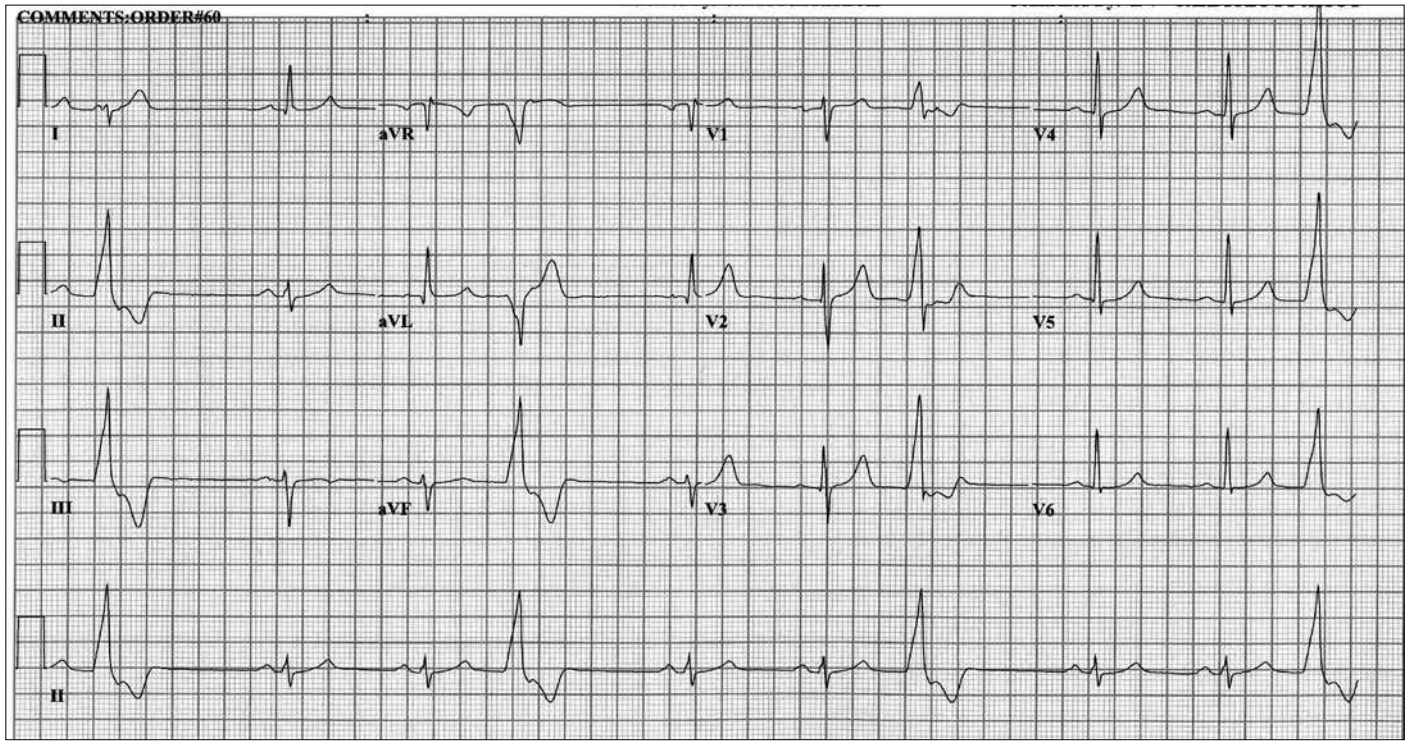

Figure 1. ECG showing ventricular ectopic with downward and right ward axis. Prominent anteriorly directed forces in V1 suggest of ectopic arising from the left ventricular outflow tract
ECG - electrocardiogram

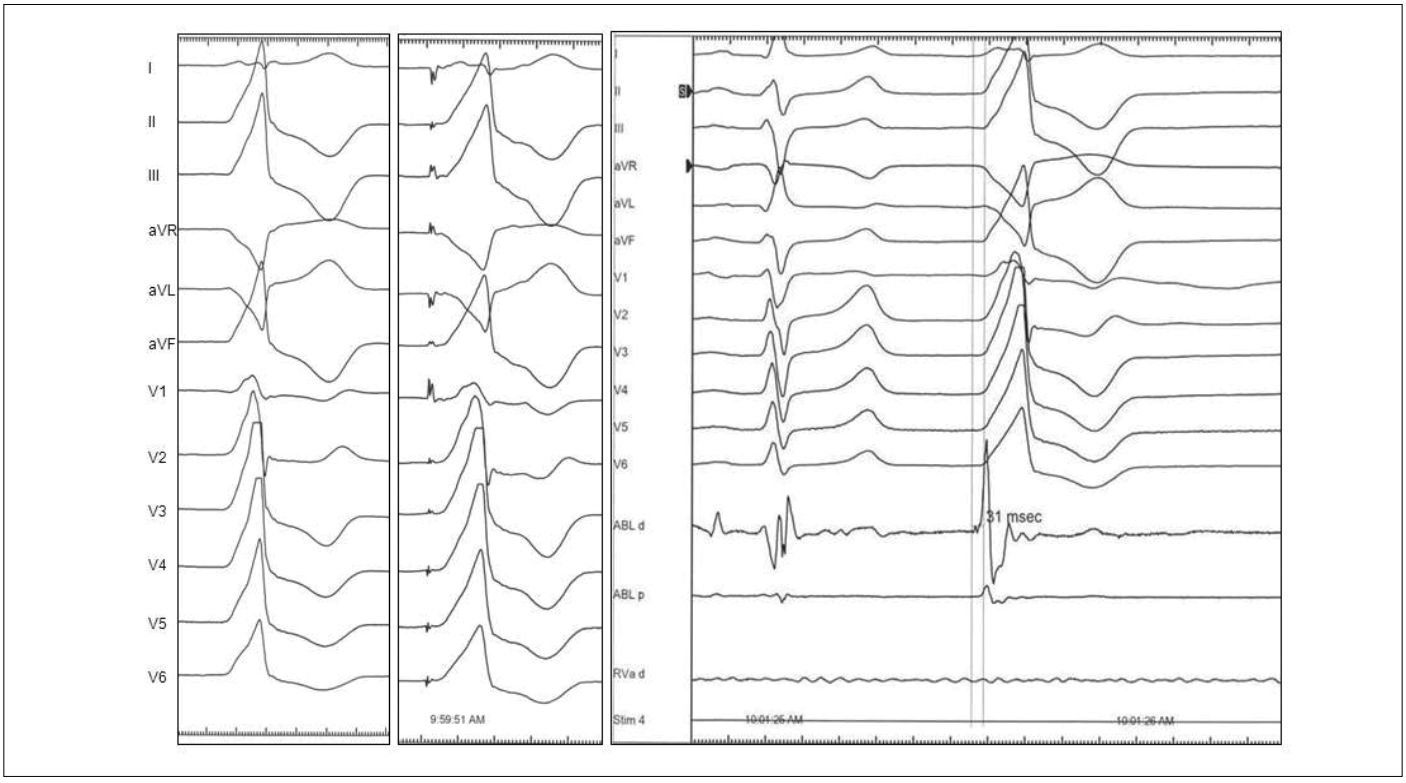

Figure 2. Pace map and activation maps of PVCs originating from the left coronary cusp
PVC - premature ventricular complex

Discussion

PVCs are common arrhythmias, which are usually benign but in some may cause LV dysfunction (2). PVCs in patients with structurally normal hearts have also been associated with worse cardiovascular outcome (3). Though PVC load is strongly associated with occurrence of CM, deterioration in cardiac function is also noted in patients with lower PVC burden. In a study of patients with PVCs, 63% of patients with PVC burden of >24% and 13% patients with PVC burden <24% had reduced LVEF (4). LVEF is noted to decline and LVEDD increase more commonly when PVC's >20.000/24hr. For patients with 5000-20.000 PVC's/day, the decline in cardiac function did occur but took a longer time to develop (5).

The development of cardiomyopathy within a year, as in the case of our patient is not well recognized. Since the PVC were not frequent and not associated with symptoms; they could have been present for a few years but not recognized. RFA was associated with significant improvement of LVEF though he had lesser PVCs (<12%). Our case suggests that RFA should be considered in patients with lower PVC burden who have deterioration in LVEF without other identified cause.

Several limitations of our study need to be acknowledged. Holter recording in our patient could have been obtained on days of lower PVC load; even if we considering a very high daily variation in PVC burden of 50%, our patient still not qualify in the high PVC burden category. One could underestimate the LVEF at the time of PVC, which happens in patients with high PVC burden. We measured the LVSD and LVDD in our patient which are less likely to be affected by PVCs. A transient non-ischemic cardiomyopathy, which improved to medical treatment could explain out the improvement in condition, though this is unlikely considering the chronology of the events.

Conclusion

RFA in patients with cardiomyopathy due to low burden PVC is associated with improved left ventricular function.

References

1. Ng GA. Treating patients with ventricular ectopic beats. Heart 2006; 92: 1707-12. [CrossRef]
2. Kostis JB, McCrone K, Moreyra AE, Hosler M, Cosgrove N, Kuo PT. The effect of age, blood pressure and gender on the incidence of premature ventricular contractions. Angiology 1982; 33: 464-73. [CrossRef]
3. Lee V, Hemingway H, Harb R, Crake T, Lambiase P. The prognostic significance of premature ventricular complexes in adults without clinically apparent heart disease: a meta-analysis and systematic review. Heart 2012; 98: 1290-8. [CrossRef]
4. Baman TS, Lange DC, Ilg KJ, Gupta SK, Liu TY, Alguire C, et al. Relationship between burden of premature ventricular complexes and left ventricular function. Heart Rhythm 2010; 7: 865-9. [CrossRef]
5. Takemoto M, Yoshimura H, Ohba Y, Matsumoto Y, Yamamoto U, Mohri M, et al. Radiofrequency catheter ablation of premature ventricular complexes from right ventricular outflow tract improves left ventricular dilation and clinical status in patients without structural heart disease. J Am Coll Cardiol 2005; 45: 1259-65. [CrossRef]

Address for Correspondence/Yazışma Adresi: Dr. Nasir Shariff
Lehigh Valley Hospital and Health Network Allentown, PA 18103
Pennsylvania-*USA*
Phone: 610-402-8275 Fax: 610-402-1675
E-mail: nasirshariff@gmail.com
Available Online Date/Çevrimiçi Yayın Tarihi: 25.11.2013

Anadolu Kardiyol Derg
2013; 13: 812-8

doi:10.5152/akd.2013.4744

Bilateral pseudoaneurysm secondary to intraarterial tianeptine abuse

Tianeptin kötüye kullanımına sekonder gelişen bilateral psödoanevrizma

Gökhan İlhan, Şaban Ergene, Tuğba Durakoğlugil*, Hakan Karamustafa, Ozan Karakişi, Şahin Bozok
From Departments of Cardiovascular Surgery and *Radiology, Recep Tayyip Erdoğan University Training and Research Hospital, Rize-*Turkey*

Introduction

Mycotic aneurysms occur due to destruction of the vessel wall, either by infection of a previously healthy artery wall, or through secondary infection of a preexisting aneurysm. Although mycotic aneurysms are frequent in femoral artery, mycotic pseudoaneurysms of femoral artery are rare (1, 2).

Tianeptine is a tricyclic antidepressant with a unique mechanism of action as a glutamatergic modulator. However, tianeptine is also known for its abuse and dependence potential (3-5).

We hereby report a case with bilateral femoral pseudoaneurysm due to intraarterial administration of tianeptine in a patient with drug addiction, and surgical treatment of this type of pseudoaneurysm.

Case Report

A 32-year-old male with a history of drug abuse was admitted to emergency clinic with a bleeding right inguinal mass in right inguinal region. The patient declared that after taking oral tianeptine tablets for 1 year as an antidepressant, he started dissolving the tablets in warm water and administering through intraarterial puncture, for the last 3 months.

Figure 1. Preoperative appearance of the pseudoaneurysm

On physical examination a pulsatile right inguinal mass, bleeding, and prominent swelling of the right leg were detected (Fig. 1). Grayscale ultrasound revealed a hypoechoic cystic lesion, 7x3.5x5 cm in diameter surrounded by mural thrombus, which connected to the arterial lumen with a large neck at the right femoral bifurcation. A heterogeneous hyperechoic area was observed around this lesion, extending from lesion to skin, which was compatible with inflamed puncture site.

Duplex Doppler examination demonstrated "to and fro" flow pattern and characteristic "ying-yang" appearance inside the lesion adjacent to the common and superficial femoral artery (Fig. 2). Consequently, the diagnosis of femoral artery pseudoaneurysm and hematoma was made.

The patient was operated under general anesthesia. A wide-based aneurysm extending from femoral artery bifurcation to anterior aspect of superficial femoral artery including a large area of destruction in superficial femoral artery was seen. Following adequate heparinization, exploration of the aneurysmal sac, control of the proximal and distal parts of the aneurysm, the aneurysm was clamped, and hematoma was completely evacuated. Aneurysmectomy was performed by interposition with autogenous saphenous vein graft (Fig. 3). Infected

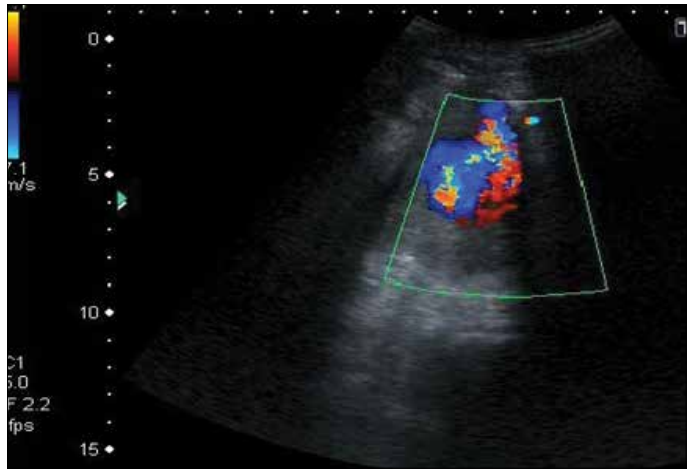

Figure 2. Color Doppler USG image showing characteristic "ying-yang" appearance in the pseudoaneurysmal sac

Figure 3. Appearance of femoral artery following interposition of a saphenous vein graft