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Address for Correspondence: Dr. Duygu Ersan Demirci
Antalya Eğitim ve Araştırma Hastanesi
Kardiyoloji Anabilim Dalı, Antalya-*Türkiye*
Tel: +90 505 684 73 21
Email: duygu_ersan@yahoo.com

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Short-term evolution of cardiac structure and function in patients on maintenance hemodialysis for end-stage renal disease: A quasi-experimental, non-randomized, evaluation echocardiography study in Cameroon, sub-Saharan Africa

To the Editor,

Adequate hemodialysis has been shown to improve volume overload and uremia in the short term. The short-term modifications to cardiac structure and function with hemodialysis in chronic kidney disease have not been prospectively studied in our setting.

Between December 2016 and May 2017, we carried out a quasi-experimental, non-randomized evaluation study in 2 hemodialysis centers: the university teaching hospital and the general hospital in Yaoundé, Cameroon. We included consenting adults aged ≥18 years, with an indication of maintenance hemodialysis. We collected baseline echocardiographic data before initiating dialysis, and after 60 days of thrice-weekly sessions of maintenance hemodialysis. Measurements were collected with a SonoScape S8 echograph (SonoScape Medical Corp., Shenzhen, China) by the same cardiologist, blinded to the pre-dialysis measurements.

A total of 31 patients with end-stage renal disease were recruited for the study. At day 60, 20 participants completed the study, and 11 were excluded from the analysis.

Of the 20 patients, there were 16 (80%) men. Their mean age was 45±14 years (range: 22-70 years). The most frequent abnormalities were diastolic dysfunction in 19 (95%), with 5 grade 1 (26.3%), 7 grade 2 (36.8%), and 7 grade 3 (36.8%); left atrial (LA) dilation in 14 (70%); and left ventricular hypertrophy (LVH) in 12 (60%), with 10 concentric LVH and 2 eccentric LVH.

All systolic dysfunction (100%) was mild (ejection fraction: 40-50%).

After the 16th hemodialysis session, LV mass index decreased by 15% (p=0.01), and LA volume decreased by 40.1% (p=0.01).

The LV ejection fraction increased by 4.4% units overall (p=0.67). The overall E/Ea ratio decreased by 23.3% (p=0.07). The improvements in LV structure and function were significant in those with initially abnormal values.

The rate of echocardiographic abnormalities in this study was similar to that reported by other authors (1, 2). Ejection fraction is an insensitive marker of LV function compared with myocardial deformation-strain and strain rate (3). Covic et al. (4) also noted a marginal increase in LV ejection fraction after 22 months of follow-up in a cohort of 150 patients. LV diastolic dysfunction with elevated filling pressure (E/Ea ratio) improved significantly. Hampl et al. (5) reported a significant reduction in LV mass in 22% of patients after 18 months of follow-up. We have shown that the reduction in LV mass with twice-weekly hemodialysis occurs in as little as 2 months. LV hypertrophy can be a result of volume and or pressure overload. We noted a marked reduction of almost 50% in LA volume. This suggests that LA volume assessment is a sensitive marker of changes in LA size. Similar reductions were reported by Covic et al. (4). We did not find any determinant of improvement of LV structure and function.

In conclusion, The LV mass and LA size were significantly reduced with hemodialysis after the 16th session. LV diastolic function also significantly improved. We suggest further studies be carried out on a larger sample and include strain rate in assessing LV systolic function.

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Ba Hamadou[1,2], Ingrid Balemaken[1], Jérôme Boombhi[1,*], Félicité Kamdem[3], Sylvie Ndongo Amougou[1,4], Liliane Kuate Mfeukeu[1,2], Chris Nadège Nganou[1,2], Alain Menanga[1,*], Gloria Ashuntantang[1,]**
[1]Department of Medicine and Specialties, Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1; Yaoundé-*Cameroon*
[2]Cardiology Unit, Central Hospital of Yaoundé; Yaoundé-*Cameroon*
Cardiology Unit, Medicine B, ****Nephrology and Hemodialysis Unit, General Hospital of Yaoundé; Yaoundé-*Cameroon
[3]Faculty of Medicine and Pharmaceutical Sciences, University of Douala; Douala-*Cameroon*
[4]Cardiology Unit, University Teaching Hospital of Yaoundé; Yaoundé-*Cameroon*

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Address for Correspondence: Ba Hamadou, MD
Cardiology Unit, Central Hospital of Yaoundé
Department of Medicine and Specialties
Faculty of Medicine and Biomedical Sciences
University of Yaoundé 1; Yaoundé-Cameroon
PoBox: 1364 FMBS-UY1-*Cameroon*
Tel: 00 (237) 696416842
E-mail: drhamadouba@yahoo.fr

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A case of acute intrastent thrombosis accompanied by arterial thrombosis in the lower extremities after percutaneous coronary intervention

To the Editor,

Acute coronary stent thrombosis is one of the most serious complications of percutaneous coronary intervention (PCI). The incidence rate of acute stent thrombosis ranges from 0.4% to 0.6% (1). This report describes a case of intrastent thrombosis within 24 hours after coronary artery stent placement, followed by arterial thrombosis in the lower extremity.

A male patient, aged 54 years, was admitted to the hospital due to chest tightness and chest pain. The patient underwent coronary angiography and the results indicated right coronary artery (RCA) narrowing greater than 90% at the most severe location, 60% narrowing in the original stents, and 70% narrowing at the distal end. A stent was placed in the proximal segment of the RCA. However, retention of the contrast agent was observed in the stent of the proximal segment, and vascular wall dissection was considered. Another stent was implanted into the site of the vessel wall dissection, completely covering the dissection.

The patient suddenly had persistent chest pain, chest tightness, and shortness of breath 6 hours after the intervention. Emergency coronary angiography showed thrombosis and occlusion in the proximal segment of the RCA. After balloon dilatation was performed at the site of the thrombus, angiography showed resolution of the RCA occlusion and Thrombolysis in Myocardial Infarction 3 forward blood flow with no dissection or hematoma, indicating a successful intervention.

The patient then experienced persistent pain and numbness in the right lower extremity 15 hours after the second intervention, and a physical examination found no pulse palpable in the dorsalis pedis artery. Angiography of the right iliac artery was performed immediately, and indicated narrowing of the superficial femoral artery greater than 80%, thrombosis and occlusion in the proximal segment of the superficial femoral artery, and disappearance of forward blood flow. An Export aspiration catheter (Medtronic, Inc., Minneapolis, MN, USA) was guided to the superficial femoral artery, a small amount of thrombotic debris was aspirated, and a stent was placed at the site of stenosis in the superficial femoral artery.

The common causes of acute coronary stent thrombosis include: (1) factors related to coronary artery lesions: restenosis lesions, vascular graft lesions, opening lesions, bifurcation lesions, chronic occlusive lesions, or small vessel diffuse lesions; (2) factors associated with the technical operation: inappropriate stent diameter, incomplete expansion and adherence of the stent, multi-stent overlapping or excessively long stents, vascular wall dissection, or intramural hematoma; and (3) factors related to medication: low response to aspirin or clopidogrel sulfate or premature discontinuation of antiplatelet drugs (2, 3).

At present, emergency intervention is the preferred treatment for acute stent thrombosis (4). The patient in this report was given emergency percutaneous transluminal coronary angioplasty treatment, which rapidly opened the thrombus-occluded blood vessels. Research shows that stenting is an acceptable revascularization treatment for peripheral artery disease (5). This patient's intervention treatment regimen yielded a satisfactory therapeutic effect, with significant postoperative improvement of the symptoms and no complications. In summary, acute stent thrombosis is a life-threatening complication after PCI, and thrombus removal and recanalization through emergency PCI is its best treatment.

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Mao-Xiao Nie, Quan-Ming Zhao
Department of Cardiology, Beijing Anzhen Hospital, Capital Medical University; Beijing-*China*

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