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Left Atrial Appendage Occlusion in Hemodialysis Patients: Initial Experience

Cierre de la orejuela izquierda de pacientes en hemodiálisis: experiencia inicial

To the Editor,

Patients with end-stage renal disease on hemodialysis have a high prevalence of atrial fibrillation (AF), ranging from 3.8% to 27% across the different registries.[1]

AF is associated with an increased risk of systemic thromboembolic events, including ischemic stroke. In patients at a significantly high risk, as indicated by a CHA_2DS_2-VASc score ≥ 2, oral anticoagulation is recommended.

Patients on hemodialysis with associated AF have high thromboembolic and hemorrhagic event rates, reported in up to 5.61 and 8.89 cases per 100 persons-years,[2] respectively, which renders the decision to initiate antithrombotic therapy difficult. In this setting, treatment with vitamin K antagonists has been associated with excess bleeding and worse outcomes, although the results of observational studies diverge markedly and no randomized trials have addressed this question. Furthermore, the clinical guidelines of the main international scientific societies make contradictory recommendations on this topic.[3]

In addition, experience with direct-acting oral anticoagulants in hemodialysis patients is scarce and the associated bleeding risk remains high. As a result, many hemodialysis patients with AF are left without treatment for the prevention of thromboembolic events.[1]

In this setting, left atrial appendage occlusion (LAAO) appears to be an attractive alternative, as it provides protection against thromboembolic events, without increasing bleeding risk. However, to the best of our knowledge, only 1 previous study has assessed the early efficacy and safety of LAAO in hemodialysis patients[4] and no data on long-term efficacy have been published to date.

We performed a single-center retrospective analysis of patients with nonvalvular AF on hemodialysis that had undergone a LAAO procedure, to assess its long-term efficacy and safety in a real-world cohort of hemodialysis patients.

Between January 2013 and January 2018, 14 patients were identified. The mean age at the time of the procedure was 69.21 ± 11.58 years and 10 (71.4%) patients were male. Baseline thromboembolic and bleeding risk were both high with mean CHA_2DS_2-VASc score of 4.5 ± 1.45 and mean HAS-BLED of 5.0 ± 0.96. LAAO was recommended because of previous significant bleeding in 11 patients (78.6%), labile international normalized ratio in 5 (35.7%), and hematological disorders in one patient (7.1%).

LAAO was performed with a Watchman device (Boston Scientific) in 7 patients, with an Amulet device (Abbott Vascular) in 6 patients, and with an Ultraseal (Cardia Inc) in 1 patient. Device deployment was successful in all cases and no device-related or periprocedural complications developed, with the exception of an allergic reaction to iodine contrast in 1 patient (Table 1). All patients were successfully discharged home within 2 days and there were no early deaths or complications at 30 days.

Postprocedural antithrombotic management included a 45-day period of dual antiplatelet therapy in 12 patients (85.7%), and single antiplatelet therapy with low-dose aspirin thereafter.

During a median follow-up of 585 days, 4 patients had bleeding complications, with 3 BARC 2 minor bleeding events and 2 BARC 3a hemorrhage, requiring transfusion. Importantly, no thromboembolic events were recorded during follow-up.

The usefulness of LAAO in patients with chronic kidney disease has been previously described. LAAO has shown comparable procedural safety among patients with and without chronic kidney disease and has been proven to be effective in significantly reducing cerebrovascular and bleeding rates at all chronic kidney disease stages compared with the expected annual risk.[5,6] However, only 1 previous study[4] has reported the preliminary feas-

Table 1
Patient Follow-up

Early follow-up	Number of events	Event description	Median time to event (d)
Periprocedural complications (first 72 h)	1	Allergic reaction to iodine contrast	_
In-hospital mortality	0	0	_
30-day mortality	0	0	_
Long-term follow-up	Number of events	Event description	Median time to event (d)
Stroke/transient ischemic attack	0	0	_
Bleeding	4	BARC 2 bleeding events: 3 BARC 3a bleeding events: 1	129

BARC, Bleeding Academic Research Consortium.

ibility and safety results of LAAO in hemodialysis patients and its long-term efficacy has not been investigated.

The current study offers an initial insight into this clinical problem, by providing long-term follow-up data, which is essential to assess the efficacy of LAAO at preventing thromboembolic events in this very high-risk population.

The present analysis suggests that LAAO could be a safe and effective procedure in hemodialysis patients, in which it may be a reasonable alternative to oral anticoagulation. Nevertheless, careful attention to baseline comorbidities prior to indication of LAAO is of the utmost importance in this population, and further randomized trials are warranted.

CONFLICTS OF INTEREST

I. Cruz-González is proctor for Abbot Vascular. No other conflicts of interest exist.

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Use of Extracorporeal Membrane Oxygenator in Massive Pulmonary Embolism

Uso del oxigenador extracorpóreo de membrana venoarterial en pacientes con tromboembolia pulmonar de alto riesgo

To the Editor,

Massive or high-risk pulmonary embolism (PE) is defined as impaired pulmonary circulation capable of causing hypoxemia, right ventricular failure, and hemodynamic instability, leading to death in 25% of patients in shock or up to 65% if there is cardiopulmonary arrest (CPA).[1]

In patients who are more unstable due to severe shock, cardiac arrest, or labored breathing, commonly used reperfusion measures (eg, fibrinolysis, surgical embolectomy, or percutaneous procedures) may be insufficient or have delayed efficacy. In these patients, cardiopulmonary assistance based on the venoarterial extracorporeal membrane oxygenator (VA-ECMO) may be an option.[2] To date, several series have been published on the use of ECMO in high-risk PE, although there is little experience with the device in Spain.

In this study, we retrospectively analyzed cases of ECMO implantation in patients with high-risk PE at our hospital between July 2013 and June 2018. Implantation was indicated due to PE with in-hospital CPA or established shock refractory to catecholamines. In all patients, VA-ECMO was implanted by femoro-femoral cannulation in the interventional cardiology laboratory, the critical heart care unit, or the emergency department.[3] Patients received anticoagulation with sodium heparin, for a target international normalized ratio of 2.0 to 2.5 and anti-Xa factor of 0.3-0.6 IU/mL.

During the study period, a total of 11 VA-ECMO devices were implanted in patients with high-risk PE (Table 1), accounting for 13.8% of all 80 patients treated with ECMO at our hospital during this period. The mean age was 60 ± 8 years, and 8 (72.7%) patients were men. A total of 9 (81.8%) patients experienced CPA, and peripheral VA-ECMO was implanted during the arrest in 4 (36.4%) of them. Median lactate before implantation was 12 mmol/L [interquartile range, 8.5-14.5], and the median implantation time was 25 [22.5-35.0] minutes. A total of 8 (72.7%) patients received some form of early reperfusion therapy: isolated systemic fibrinolysis in 3, isolated percutaneous thrombectomy in 1, and combined percutaneous thrombectomy and fibrinolysis in 4 (2 local, 2 systemic). Among these 8 patients who underwent reperfusion, 7 (87.5%) experienced serious complications related to these therapies (6 major bleeding episodes related to fibrinolysis, 2 CPA events during thrombectomy). In the 4 patients who received ECMO during CPA, 2 were alive at discharge (50% survival), and the other 2 died, 1 of anoxic encephalopathy 48 hours after implantation and the other of multiorgan failure within 24 hours after the procedure. One of the 2 survivors experienced CPA in the interventional cardiology laboratory, undergoing early implantation of ECMO before thrombectomy. The second patient experienced CPA and underwent implantation in the emergency department, without subsequently requiring reperfusion therapy.

Total survival in the series was 45.5%, similar to that in other published series.[4–6] Of the 6 patients who died, 4 had anoxic encephalopathy and 2 had multiorgan failure. Patients who initially received ECMO alone had a higher survival rate (66.7%) than those who received early reperfusion therapy (37.5%). Furthermore, treatment with ECMO alone was not associated with major bleeding episodes.

Despite the inherent limitations of this type of study to establish differences, we believe that treatment with ECMO alone may be an effective alternative, as it allows thrombus dissolution by heparin and by spontaneous endogenous mechanisms, as well as the recovery of right ventricular function, possibly with fewer complications than when adding fibrinolysis or early thrombectomy. In patients refractory to this therapy, deferred surgical or percutaneous thrombectomy would be an option.[4,6]