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Editorial comment

Antithrombotic therapy after percutaneous left atrial appendage closure: should it be the same for everyone?

Tratamiento antitrombótico tras el cierre percutáneo de orejuela izquierda, ¿debe ser el mismo para todos?

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INTRODUCTION

Percutaneous left atrial appendage closure (LAAC) is now a well-established treatment for atrial fibrillation in patients with contraindications for long-term oral anticoagulant therapy or a high risk of bleeding. LAAC has been shown to be comparable to anticoagulant therapy in preventing cardioembolic stroke and reducing major and clinically relevant nonmajor bleeding events.[1,2] Device-related thrombosis (DRT), however, remains a significant concern, as it can compromise the effectiveness of LAAC and pose long-term safety issues. Although DRT can increase the risk of embolic events, its exact clinical effects remain unclear due to the many presentations of thrombosis, which range from subclinical hypoattenuated thickening to mobile thrombi with a high risk of embolism.[3,4]

Numerous factors contribute to DRT risk, including patient-related factors such as older age, comorbidities, baseline thromboembolic risk, and time in atrial fibrillation; anatomic factors, in particular LAA morphology, as more complex configurations make complete closure challenging; and procedural factors, such as operator experience, choice of device, implantation quality, and postprocedural antithrombotic therapy.[1,3] This last factor is of particular interest due to the shortage of robust evidence on the impact of different antithrombotic strategies following LAAC.

ANTITHROMBOTIC THERAPY: BALANCING EFFECTIVENESS AND SAFETY

Post-LAAC antithrombotic therapy is closely linked to the closure device used and the outcomes of the procedure. Devices currently fall into 2 main categories: single-lobe devices (eg, WATCHMAN; Boston Scientific, USA) and lobe-and-disc devices (eg, Amplatzer Amulet; Abbott, USA and LAmbre; Lifetech Scientific, China). Although studies comparing the devices have not found any significant differences in efficacy or safety,[5] implantation quality is important, as procedural outcomes affect the risk of thrombosis and determine the subsequent antithrombotic strategy.

Peridevice leaks (≥ 3 mm) and incorrect device positioning relative to the LAA ostium can significantly increase DRT risk. Recent findings showing that suboptimal deployment was associated with a 4.5-fold increased risk of thrombosis highlight the importance of operator experience and the use of advanced imaging for proper placement.[6]

The goal of antithrombotic therapy after LAAC is to strike a balance between preventing DRT and embolic events and minimizing bleeding risk. Appropriate treatment from the outset is critical, as most thrombotic events occur in the first few months. It is important to remember, however, that patients undergoing this procedure typically have a high baseline bleeding risk and that postprocedural bleeding complications can significantly increase mortality.[7] Identifying which patients might benefit from a more intensive treatment strategy is thus essential.

Decisions regarding antithrombotic strategies and treatment duration are generally based on expert consensus, as robust evidence on the efficacy and safety of different strategies is lacking.[8] The most common approach is anticoagulation or dual antiplatelet therapy for 6 to 12 weeks, followed by single antiplatelet therapy for a year. The goal of this strategy is to prevent early thrombotic complications and further ensure patient safety by reducing the risk of bleeding. Single antiplatelet therapy has shown promising effectiveness and safety outcomes in patients at high risk of bleeding.[9,10]

The recently published study by Garot et al.[11] in *Revista Española de Cardiología* provides key insights into the impact of antithrombotic strategies on DRT. The authors conducted a prospective observational study of 1225 patients who underwent LAAC and were followed up for at least 12 weeks. Significant differences were

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observed for the incidence of DRT depending on whether the patients had been treated with an intensive antithrombotic regimen (anticoagulation or dual antiplatelet therapy) or a nonintensive one (single antiplatelet therapy or no antithrombotic therapy). On multivariate analysis, suboptimal device implantation was the only independent predictor of DRT risk (hazard ratio [HR], 4.51; 95%CI, 2.70–7.54; $P < .001$). Although a trend towards fewer thrombotic events was observed in the intensive treatment group, the difference with the nonintensive group was not significant (HR, 0.66; 95%CI, 0.40–1.07; $P = .09$). Use of a lobe-and-disc device was associated with a lower risk of DRT in the univariate analysis but not in the multivariate analysis (HR, 0.70; 95%CI, 0.43–1.13; $P = .15$). On stratifying the results by implantation quality (optimal vs suboptimal), intensive treatment was associated with a reduced risk of thrombosis in both groups (2.6% and 3.7%, respectively), but again, the difference was not significant. The groups had comparable major and clinically relevant nonmajor bleeding rates in all the analyses conducted.

The findings of Garot et al.[11] highlight the importance of personalized treatment and consideration of individual thrombotic and bleeding risks and postprocedural anatomic outcomes.[8,12] Patients with an optimal outcome and a high bleeding risk might benefit from single antiplatelet therapy directly following the procedure, as this would reduce the risk of complications. An intensive approach based on either anticoagulation or dual antiplatelet therapy, however, might be more appropriate in patients with a suboptimal outcome and a lower bleeding risk. Whatever the case, a tailored approach is necessary to optimize clinical outcomes and reduce unnecessary risks.

The choice of device is also important. The specific configuration of lobe-and-disc devices may offer advantages in patients with complex anatomic features, such as an irregularly shaped appendage or large residual leaks.[13] If implantation is suboptimal, however, these devices can increase the risk of complications. Preprocedural imaging with computed tomography or 3-dimensional echocardiography is essential for choosing the most suitable device and closure strategy for each patient.

Post-LAAC follow-up is equally important. The follow-up evaluation should include not only assessment of anatomic outcomes but also close monitoring of the effects of antithrombotic therapy. Computed tomography has proven to be a valuable adjunct to transesophageal echocardiography in this setting, as it helps detect LAA patency, residual leaks, and subclinical device-related thrombosis.[14] Follow-up findings are important, as they can prompt reconsideration of initial antithrombotic strategies, especially when tolerance issues, bleeding events, or evidence of DRT indicate the need for treatment adjustment.

Antithrombotic therapy after LAAC is an evolving field. Our ability to establish universal recommendations, however, continues to be limited by a lack of randomized clinical trials. Future research should focus on the validation of biomarkers for better stratifying patients according to DRT risk. These biomarkers could include inflammatory markers, platelet activation markers, and genetic factors associated with thrombogenicity. Another research priority is the design of devices that reduce the risk of peridevice leaks and improve anatomic adaptability. Technological advances in this area could reduce the need for intensive treatment and minimize associated bleeding risks. Finally, the wide variety of antithrombotic regimens used in current clinical practice highlights the need for clinical trials directly comparing these strategies. Future trials should investigate not only the incidence of DRT but also the long-term effects of antithrombotic treatments on clinical outcomes, such as major bleeding rates and the prevention of stroke and systemic embolism.

CONCLUSIONS

Antithrombotic therapy following LAAC should be personalized, with consideration given to individual risk profiles, choice of closure device, and implantation outcomes. Patients with an optimal outcome and a high bleeding risk may benefit from single antiplatelet therapy from the outset, whereas those with suboptimal implantation may require a more aggressive short-term approach. Decisions should be made in a multidisciplinary setting and aim to strike an optimal balance between effectiveness and safety. Future research will play a key role in the development of more personalized, evidence-based strategies to improve outcomes in this setting.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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