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Intracranial Hemorrhage during Dual Antiplatelet Therapy after Percutaneous Left Atrial Appendage ClosureLaura Llull^a, Victoria Martín^b, Bàrbara Vidal^c, Álvaro Cervera^a^aUnitat Funcional de Patologia Vascular Cerebral, ^bUnitat d'Hemodinàmica, and ^cSecció de Diagnòstic Cardiològic no Invasiu, Hospital Clínic, Barcelona, Spain

Percutaneous left atrial appendage occlusion (LAAO) is an alternative to oral anticoagulation for stroke prevention in atrial fibrillation (AF) [1]. This approach has been proposed in patients with a higher risk of stroke [2], contraindications for long-term anticoagulation therapy, and/or increased risk of bleeding [3]. In

patients with intracranial hemorrhage (ICH), it is a promising therapy, as anticoagulants are generally not advised. A recent study has shown that LAAO is safe and feasible in patients with AF and a previous history of ICH [4].

A strict echocardiographic follow-up protocol and dual antiplatelet therapy are recommended for at least 3 months to avoid thrombus formation on implantation of the device. However, this treatment increases hemorrhagic risk and has recently been associated with a fatal ICH after device implantation [5]. We report a case of symptomatic ICH and thrombus formation on the surface of the device in a patient taking dual antiplatelet therapy after LAAO.

A 70-year-old patient with a history of AF on acenocoumarol for stroke prevention was admitted to the Stroke Unit with a left parieto-occipital hemorrhage. His INR was 2.3 and a cranial MRI (fig. 1a) showed a subacute lobar hemorrhage and multiple chronic microbleeds. As the bleeding risk was very high, anticoagulation was not restarted. Instead, he received 100 mg aspirin daily, and we offered the patient the possibility of LAAO, which he accepted.

Color version available online

Fig. 1. **a** T2*-weighted MRI images performed after first admission showing a subacute parieto-occipital hemorrhage and numerous chronic microbleeds. **b** Percutaneous LAAO: due to the complex anatomy of the atrial appendage, a pig tail catheter was used to reach the distal curve and place the device (arrowhead). **c** Cranial CT showing an acute parietal hemorrhage suffered while on dual antiplatelet therapy. **d** Transesophageal echocardiography revealed a thrombus on the surface of the atrial disc of the device.

Months later he underwent LAAO using an Amplatzer device (St. Jude Medical). The device was placed correctly without immediate complications (fig. 1b). He started double antiplatelet therapy with aspirin (100 mg/day) and clopidogrel (75 mg/day). Three months later, he was readmitted to the Stroke Unit with anomic aphasia. The cranial CT showed a new left parietal lobar hemorrhage (fig. 1c). A transesophageal echocardiography (TEE) revealed a thrombus on the surface of the atrial disc (fig. 1d); so we maintained antiplatelet treatment with aspirin. Three months later, mild aphasia persisted. A new TEE showed no thrombus on the device surface. Complete appendage occlusion was proven after contrast administration.

Percutaneous LAAO has emerged as an attractive alternative to oral anticoagulation. However, there is a risk of thrombotic complications on the surface of the device. TEE is an appropriate diagnostic tool that permits the early detection of emerging thrombosis and allows the rapid initiation of intravenous anticoagulation to dissolve the thrombus. So, a strict echocardiographic follow-up protocol has been suggested after the intervention [6]. Moreover, the risk of hemorrhagic complications with dual antiplatelet treatment is similar to that present during oral anticoagulation [7]. Nevertheless, dual therapy is highly recommended to prevent serious thrombotic events after LAAO. Prospective and long-term studies are needed to define an appropriate antithrombotic therapy in this specific group of patients.

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