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Neurovascular disease

Percutaneous left atrial appendage occlusion for stroke prevention in patients with atrial fibrillation and contraindication for anticoagulation

L'occlusion percutanée de l'auricule gauche dans la prévention de l'infarctus cérébral chez les patients avec fibrillation atriale et contre-indication aux anticoagulants

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ABSTRACT

Background. – Stroke, as the third cause of death in developed countries, is a public health issue. Atrial fibrillation is an important cause of ischemic stroke and its prevention is efficient with oral anticoagulation. However, oral anticoagulation can be contraindicated because of hemorrhagic risk related to these treatments. Percutaneous left atrial appendage occlusion is a new alternative of oral anticoagulation for patients with atrial fibrillation and high risk of cardio-embolic stroke but contraindicated for oral anticoagulation.

Methods. – We describe in this paper the procedure of left atrial appendage occlusion with the Amplatzer cardiac plug device, used in our center in Grenoble university hospital, for the first three patients who have been treated with this device. These three patients (one man and two women) have all atrial fibrillation with neurological complication of this arrhythmia, as ischemic stroke. Oral anticoagulation is indicated to prevent another ischemic stroke. However, they all have a high risk of cerebral bleeding for different reasons (cavernomatosis, history of intracerebral hemorrhage and aneurysm of the polygon of Willis). Consequently, they have a high risk of cardio-embolic complication but contraindication for oral anticoagulation. They have been treated by left atrial appendage occlusion with Amplatzer cardiac plug device by percutaneous and trans-septal access. Then, they have been followed by neurologist and cardiologist, with clinical and paraclinical evaluation by echocardiography.

Results. – Our three first patients have been successfully implanted, without periprocedural complication. No latest adverse event was observed, and particularly no cardiac or neurologic adverse event.

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Conclusion. – The technique of left atrial appendage occlusion is a very interesting and promising technique for ischemic stroke prevention in patient with high risk of cardio-embolic complication because of atrial fibrillation, but high risk of bleeding and contraindication for oral anticoagulation. Because of frequency of both atrial fibrillation and contra-indication for oral anticoagulation, occlusion of the left atrial appendage should become an interesting alternative for many patients. However, it remains an invasive procedure and efficacy and indications need to be evaluated in further clinical trials. Risk/benefit ratio must be carefully assessed and compared to that of the new anticoagulant drugs.

RÉSUMÉ

Introduction. – L'accident vasculaire cérébral est un problème de santé publique. L'anticoagulation orale est efficace dans la prévention de l'infarctus cérébral d'origine cardio-embolique. Cependant, elle peut être contre-indiquée en raison du risque hémorragique induit par ces traitements. L'occlusion percutanée de l'auricule gauche est une nouvelle alternative à l'anticoagulation orale pour les patients atteints de fibrillation atriale mais contre-indiqués aux anticoagulants.

Méthodes. – Nous décrivons la procédure d'occlusion percutanée de l'auricule gauche avec le dispositif *Amplatzer cardiac plug*, pour trois premiers patients traités au centre hospitalier universitaire de Grenoble. Ces trois patients avaient tous une fibrillation atriale compliquée d'un infarctus cérébral et donc une indication théorique d'anticoagulation curative. Cependant, ils avaient un haut risque hémorragique contre-indiquant cette anticoagulation. Ils ont été traités par occlusion, par voie percutanée et trans-septale, de l'auricule gauche avec le dispositif *Amplatzer cardiac plug*.

Résultats. – Ces trois premiers patients ont été implantés avec succès, sans complication perprocédure ou à distance.

Conclusion. – L'occlusion de l'auricule gauche est une technique prometteuse dans la prévention de l'infarctus cérébral chez les patients présentant une fibrillation atriale et une contre-indication aux anticoagulants. Cependant, cela reste une procédure invasive, devant être évaluée par d'autres essais. Le rapport bénéfice/risque doit être soigneusement évalué et devra être comparé à celui des « nouveaux » anticoagulants.

1. Abbreviations

LAA	Left atrial appendage
AF	Atrial fibrillation
OAC	Oral anticoagulation
TEE	Transesophageal echocardiography
MRI	Magnetic resonance imaging
ACP	Amplatzer cardiac plug
MCA	Middle cerebral artery

2. Introduction

Stroke is the third leading cause of death and the first cause of disability in developed countries. Atrial fibrillation (AF) is responsible for 15% of strokes [1,2]. After a stroke, AF leads to an increase of mortality (32.5% vs. 16.2% without AF) [3] and an increase of severe disability at one year (Barthel index < 40 for 30.0% vs. 10.9% without AF) [4]. AF is therefore associated with an independent risk of serious cardiac adverse events after an ischemic stroke [5]. In non-valvular AF, more than 90% of atrial thrombi form in the left atrial appendage (LAA) [6,7].

The current European society of cardiology guidelines for management of AF recommend oral anticoagulation (OAC) for patient with a CHADS2-Vasc2 score of 1 or higher [8]. But OAC carries the risk for hemorrhagic complications.

Warfarin, the most commonly applied drug for OAC, reduces the risk for ischemic stroke in AF population study by 65% [9], but in real life, patients often appear to have an INR outside the therapeutic window [10]. Also, because of the bleeding risk, OAC is often not prescribed although indicated. New OAC drugs such as anti-Xa factors provide similar or better stroke prevention than Warfarin but are still associated with bleeding complications [11].

Oral anticoagulation is clearly superior to antiplatelet agents (Clopidogrel and/or Aspirin) in prevention of vascular events notably stroke. When OAC is unsuitable, the use of double antiplatelet agents leads to a risk of hemorrhage [12].

Many patients have both contraindications for OAC, because of high risk of bleeding, and a high risk of cardio-embolic complications such as ischemic stroke. Several techniques are developed in alternative to anticoagulation