4. Kannel WB, Benjamin EJ. Status of the Epidemiology of Atrial Fibrillation. Med Clin North Am. 2008;92(1):17–40. doi:10.1016/j.mcna.2007.09.002.

5. Group EAFTS. Secondary prevention in non-rheumatic atrial fibrillation after transient ischaemic attack or minor stroke. Lancet. 1993;342:1255–62.

6. Ruff CT, Giugliano RP, Braunwald E, Hoffman EB, Deenadayalu N, Ezekowitz MD, et al. Comparison of the efficacy and safety of new oral anticoagulants with warfarin in patients with atrial fibrillation: A meta-analysis of randomised trials. Lancet. 2014;383(9921):955–62. doi:10.1016/S0140-6736(13)62343-0.

7. Blackshear JL, Odell JA. Appendage obliteration to reduce stroke in cardiac surgical patients with atrial fibrillation. Ann Thorac Surg. 1996;61(2):755–9. doi:10.1016/0003-4975(95)00887-X.

8. Bloomberg A, Blumberg P, Haimovici H. Auricular Thrombosis, Mitral Commissurotomy, and Aortic Embolectomy. J Am Med Assoc. 1952;150(12):1216. doi:10.1001/jama.1952.63680120019010g.

9. Reddy VY, Doshi SK, Kar S, Gibson DN, Price MJ, Huber K, et al. 5-Year Outcomes After Left Atrial Appendage Closure: From the PREVAIL and PROTECT AF Trials. J Am Coll Cardiol. 2017;70(24):2964–75. doi:10.1016/j.jacc.2017.10.021.

10. Möbius-Winkler S. Percutaneous left atrial appendage closure: Technical aspects and prevention of periprocedural complications with the watchman device. World J Cardiol. 2015;7(2):65. doi:10.4330/wjc.v7.i2.65.

11. Dieker W, Behnes M, Fastner C, Sartorius B, Wenke A, Sing-Gill I, et al. Impact of left atrial appendage morphology on thrombus formation after successful left atrial appendage occlusion: Assessment with cardiac-computed-tomography. Sci Rep. 2018;8(1):1–6. doi:10.1038/s41598-018-19385-z.

12. Bedeir K, Warriner S, Kofsky E, Gullett C, Ramlawi B. Left Atrial appendage epicardial clip (ATRiCLIP): Essentials and post-procedure management. J Atr Fibrillation. 2019;11(6):1–4. doi:10.4022/jafib.2087.

13. Bergmann MW, Betts TR, Sievert H, Schmidt B, Pokushalov E, Kische S, et al. Safety and efficacy of early anticoagulation drug regimens after WATCHMAN left atrial appendage closure: Three-month data from the EWOLUTION prospective, multicentre, monitored international WATCHMAN LAA closure registry. EuroIntervention. 2017;13(7):877–84. doi:10.4244/EIJ-D-17-00042.

14. Ellis CR, Aznaurov SG, Patel NJ, Williams JR, Sandler KL, Hoff SJ, et al. Angiographic Efficacy of the Atriclip Left Atrial Appendage Exclusion Device Placed by Minimally Invasive Thoracoscopic Approach. JACC Clin Electrophysiol. 2017;3(12):1356–65. doi:10.1016/j.jacep.2017.03.008.

CASE REPORT

Finding Closure: The First WATCHMAN Device in the English-Speaking Caribbean

R Ramsingh[1], S Juman[1], MJ Ibrahim[2], R Rampersad[1]

[1]Caribbean Heart Care Medcorp, Cardiology Department, St Clair Medical Centre, St Clair, Port of Spain, Trinidad and Tobago

[2]School of Medicine, Faculty of Medical Sciences, The University of the West Indies, St Augustine, Trinidad and Tobago

Corresponding Author:

Richard Ramsingh
St Clair Medical Centre
18 Elizabeth St
St Clair
Trinidad and Tobago
Email: ramsinghrichard@gmail.com

DOI: 10.48107/CMJ.2020.12.004

ABSTRACT

The left atrial appendage is an important source of thromboembolism and stroke in patients with nonvalvular atrial fibrillation. Mechanical closure with WATCHMAN has been proven as an effective alternative to Vitamin K antagonist anticoagulation for stroke prophylaxis. We report the first case of this technology in the English-speaking Caribbean.

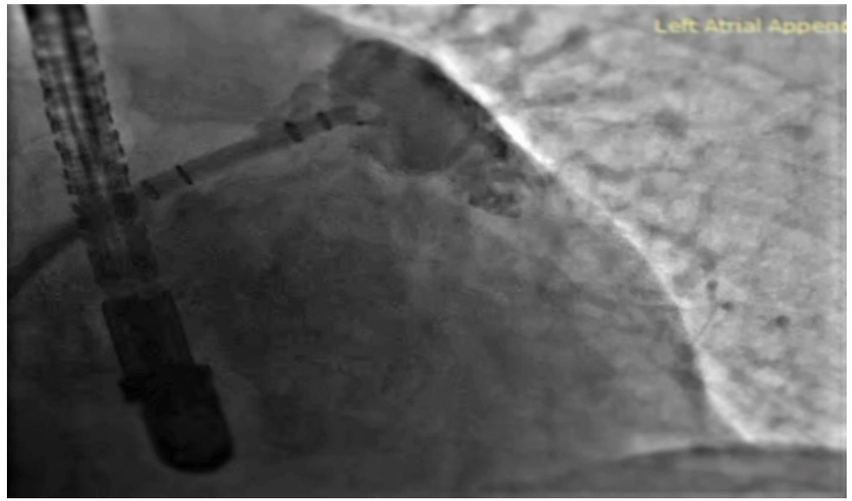
INTRODUCTION

Current guidelines recommend that patients with atrial fibrillation (AF) should receive anticoagulation to reduce the risk of systemic embolization.[1] However, some patients who are predisposed to bleeding, or have survived a life-threatening bleed on anticoagulation, are not candidates for this therapy. Consequently, emerging technology has targeted left atrial appendage (LAA) closure with an aim to prevent LAA thromboembolism. The WATCHMAN (Boston Scientific) is one such device and is the most commonly used worldwide.[2][3] Here, we report the use of this new technology for the first time in the English-speaking Caribbean.

CASE

A 77-year old hypertensive male with known permanent atrial fibrillation on oral vitamin K antagonist anticoagulation presented with left-sided weakness, dizziness, diplopia and dysphasia. A non-contrast computer tomography scan of the head showed a left-sided intra-parenchymal haemorrhage. The CHA2DS2-VASc score was 5 and the HAS-BLED score was 4. After considering the risks and benefits of anticoagulation, a decision was made with the patient to stop oral anticoagulation. The patient was referred as an outpatient to a specialized cardiology service. Due to a history of prior severe bleeding and high risk of embolic stroke, we decided on the placement of a percutaneous left atrial appendage occlusion (LAAO) device. Under general anaesthesia and transoesophageal echocardiographic (TOE) guidance, a trans-septal puncture was done and the left atrial appendage was successfully closed with a 24mm WATCHMAN device (Figure). There was no was thrombus seen nor complications occurred during the procedure. Discharge

Figure: Fluoroscopy showing left atrial appendage occlusion.



medication included clopidogrel 75mg once daily and aspirin 81mg once daily for six months. Follow-up TOE guidance at four weeks and at six months showed device without thrombus and complete sealing of the appendage was achieved.

DISCUSSION

AF is the most common cardiac arrhythmia and an independent risk factor for stroke.[4] Conventional treatment entails the oral anticoagulant (OAC), warfarin, which may reduce the risk of embolic stroke in AF by two-thirds[5], provided patients are within therapeutic range and adherent to therapy. Furthermore, the advent of direct-acting oral anticoagulants (DOAC) including dabigatran, apixaban, rivaroxaban, and edoxaban, has proven to be suitable alternatives to warfarin for stroke prevention in AF.[6] Despite this, OAC is notorious for its disadvantages including increased risk of bleeding, lower quality of life, patient non-adherence, and simply a desire to avoid OACs.

The main source of embolic stroke originates from the LAA[7] and, less commonly, from atherosclerotic rupture of the carotid arteries. Given the prevalence of LAA embolism, it follows logically for therapy to target this site. For decades, this has been performed with surgical ligation, usually undertaken as a concomitant cardiac surgery.[8] However, indication for surgical LAA occlusion has only been expanded to include those undergoing minimally invasive thoracoscopic atrial fibrillation surgery with epicardial devices, such as the AtriClip (AtriCure Inc.).[1] Subsequently, there has been development of the less invasive percutaneous device-closure of the LAA over the last two decades.

In a patient-level meta-analysis combining the five-year outcomes of PREVAIL and PROTECT AF trials compared with warfarin, LAA closure with WATCHMAN provided stroke prevention in non-valvular atrial fibrillation with significant reductions in major bleeding, particularly haemorrhagic stroke, and mortality.[9] The primary efficacy endpoint (stroke, systemic embolization or cardiovascular death) was similar between LAAO and warfarin groups (2.8% vs 3.4%; HR = 0.82 (0.58–1.17), P = 0.27). In subgroup analysis of the same meta-analysis, the rate of all stroke or systemic embolism was similar between both groups (1.7% vs 1.8%; HR = 0.96 (0.60–1.54), P = 0.87). However, there was a statistically significant decrease in the rates of haemorrhagic stroke (0.17% vs 0.87%, HR = 0.20 (0.07–0.56), P = 0.002), disabling/fatal stroke (0.44% vs 1.0%; HR= 0.45 (0.21–0.94), P = 0.03), cardiovascular/unexplained death (1.3% vs 2.2%; HR = 0.59 (0.37–0.94), P = 0.027), all-cause death (3.6% vs 4.9%, HR = 0.73 (0.54–0.98), P = 0.035), and post-procedure bleeding (1.7% vs 3.6%, HR = 0.48 (0.32–0.71), P = 0.0003) in LAAO arm when compared with warfarin arm. This means that there is clinical utility in determining which AF patients are likely to be poor candidates for long-term OAC because of a propensity for bleeding or poor drug compliance. This was corroborated by the 2016 European Society of Cardiology (ESC) in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS) Guidelines, which recommends that percutaneous LAAO may be considered for stroke prevention in patients with AF and contraindications for long-term OAC (e.g., those with a previous life-threatening bleed without a reversible cause) (Class IIb, Level of Evidence B).[1]

Interventional LAA occlusion most commonly utilizes the WATCHMAN device which is currently approved in both Europe and the United States. The procedure involves a self-expanding nitinol occlusion device with catheter-based implantation into the left atrium using the guidance of trans-oesophageal echocardiography (TOE). The device is inserted through femoral vein and is passed into the left atrium through a small interatrial puncture hole that undergoes endothelization within six months. Generally, disadvantages of the percutaneous transcatheter closure of the LAA include pericardial effusions or tamponade during occlusion of the LAA. Specifically, air embolism, peri-device leak, device-related thrombosis and device embolization are related to transseptal puncture and device implantation.[10] However, routine post-procedural transthoracic echocardiography can rule out device-related thrombosis, device embolization and pericardial effusion, and increased procedure experience with time can aid in minimization of the procedural-related complications. Also, in patients with abnormal LAA morphologies, as detected by echocardiography, endocardial devices such as the WATCHMAN do not sit well within the LAA resulting in incomplete closure in which case epicardial devices may be preferable.[11][12] Lastly, to prevent device -related thrombosis while the device undergoes endothelization, the most widely used regimen recommends oral anticoagulation for up to 45 days after device implantation and dual antiplatelet therapy up to six months.[9] However, the appropriate anti-coagulation measure has not been observed as yet.[13] Notably, our patient has had no complication with dual antiplatelet therapy. Alternatively, the surgical minimally invasive thoracoscopic application of the AtriClip device can be considered for patients with an absolute contraindication to oral anticoagulants.[14]

The WATCHMAN offers us 'closure' in treating a steadily increasing group of AF patients for whom anticoagulation therapy poses an unacceptably high risk of life-threatening haemorrhage or inconvenience.

CONCLUSION

Atrial fibrillation in patients with contraindications to long-term oral anticoagulation therapy may benefit from percutaneous left atrial appendage occlusion.

Acknowledgements: None

Competing Interests: None

Ethical Approval: Yes

Funding: No sources of funding to declare

Author Contributions: The co-authors have equally contributed to this manuscript, including substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; drafting the work or revising it critically for important intellectual content; final approval of the version to be published.

REFERENCES

1. Kirchhof P, Benussi S, Kotecha D, Ahlsson A, Atar D, Casadei B, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Europace. 2016;18 (11):1609–78. doi:10.1093/europace/euw295.
2. Freeman J V., Varosy P, Price MJ, Slotwiner D, Kusumoto FM, Rammohan C, et al. The NCDR Left Atrial Appendage Occlusion Registry. J Am Coll Cardiol. 2020;75(13):1503–18. doi:10.1016/j.jacc.2019.12.040.
3. Pacha HM, Al-khadra Y, Soud M, Darmoch F, Pacha AM, Alraies MC. Percutaneous devices for left atrial appendage occlusion: A contemporary review. World J Cardiol. 2019;11(2):57–70. doi:10.4330/wjc.v11.i2.57.