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ORIGINAL ARTICLE

Retrospective Cohort Study Examining Reduced Intensity and Duration of Anticoagulant and Antiplatelet Therapy Following Left Atrial Appendage Occlusion with the WATCHMAN Device

Matthew K. Tung, MBBS, FRACP [a,b*], Satish Ramkumar, MBBS [a,b], James D. Cameron, MBBS, MD, BE (Elec), MEngSc, FIEAust., CPE (Biomed), FCSANZ [a,b], Benjamin Pang, MBBS, FRACP [a,b], Nitesh Nerlekar, MBBS, FRACP [a,b], Emily Kotschet, MBBS, FRACP [a,b], Jeffrey Alison, MBBS, FRACP [a,b]

[a]Monash Cardiovascular Research Centre, Monash University, Melbourne, Vic, Australia
[b]Monash Health, Melbourne, Vic, Australia

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Background Anticoagulant and antiplatelet therapy are recommended following WATCHMAN implantation (45 days and 6 months) to reduce the risk of embolic events. These patients are often also at high risk of recurrent bleeding complications. We aimed to assess the safety of reduced duration of treatment with anticoagulant and antiplatelet therapy in the early post implant period.

Methods This was a retrospective cohort study assessing the duration of antiplatelet and anticoagulant therapy in 47 consecutive patients following WATCHMAN implant. The primary outcome was rate of major bleeding, stroke and systemic embolic complications. The secondary endpoints were rate of device thrombus and peri-device leak >4 mm as assessed by transoesophogeal echocardiography.

Results Forty-seven patients were followed up for a mean of 2.4+/-1.7 years (111.4 total patient-years). The rate of stroke was 1.8/100 patient-years (two events) and the rate of major bleeding complication was 8.9/100 patient-years. Three patients had peri-device leak >4 mm and no patients had device thrombus visualised. 70.2% of patients had discontinued anticoagulation at 45 days, 89.4% had discontinued dual antiplatelet therapy at 90 days. Seven patients were not on any form of anticoagulant or antiplatelet at five months. Comparison of probability of survival free from stroke by time of cessation of anticoagulant and antiplatelet therapy demonstrated no significant differences (p-value for log rank test 0.238 and 0.820).

Conclusion Following WATCHMAN implant shortened periods of anticoagulants and antiplatelets may be considered, particularly in the context of high bleeding risk.

Keywords WATCHMAN • Left atrial appendage occlusion • Anticoagulation • Antiplatelet • Stroke • Atrial fibrillation

*Corresponding author at: Monash Cardiovascular Research Centre, Monash Medical Centre, 246 Clayton Road, Clayton, Victoria 3168, Australia.
Tel.: +61 (0)3 9594 4545; fax: +61 (0)3 9594 6939, Email: mattytung@gmail.com

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Introduction

Atrial fibrillation is a common arrhythmia with prevalence estimated to increase from 0.5% in 50–59-year-olds to 8.8% in 80–89-year-olds[1,2]. It is an established risk factor for cardioembolic stroke with the cornerstone of preventative therapy being anticoagulation with warfarin or newer oral anticoagulants[3–6]. The risk of stroke in patients with atrial fibrillation can be estimated with the CHA_2DS_2-VASc score with consideration for anticoagulation recommended for patients with a score of 1 or more[7].

Many patients with atrial fibrillation, assessed to be at high risk for stroke, are also high risk for major bleeding complications making chronic anticoagulation relatively contraindicated[8]. Left atrial appendage occlusion (LAAO) with the WATCHMAN device (Boston Scientific, St Paul, Minnesota) has emerged as a viable alternative to chronic anticoagulation and has been found to be non-inferior for prevention of stroke and systemic embolism compared to warfarin in large randomised controlled trials[9,10].

Anticoagulants and antiplatelet agents are prescribed post-implant due to the anticipated thrombogenicity of the device. These agents are continued until device endothelialisation has occurred which is estimated to take at least 90 days[9,11]. In the PROTECT-AF trial patients were anticoagulated with warfarin until 45 days post implant before continuing on dual antiplatelet therapy (DAPT) until 6 months from which time aspirin was continued[9]. In the PREVAIL trial aspirin (81 mg daily) in conjunction with warfarin was used until day 45 post implant when a change to DAPT (aspirin 325 mg, clopidogrel 75 mg) occurred[10]. The ALSTER-LAA Registry followed up 198 LAAO (180 WATCHMAN, 8 Amplatzer Cardiac Plugs, 10 Coherex Wavecrest devices) with DAPT shortened in some cases to three months and also use of low dose novel oral anticoagulant (NOAC)[12]. With mean follow-up of 15.1 months a stroke rate of 3.3% per year and a major bleeding rate of 1.7% per year was observed. Chun et al. prospectively assessed the safety of six weeks of DAPT followed by aspirin alone in 76 patients (38 WATCHMAN, 38 Amplatzer Cardiac Plugs) with median follow of 364 days[13]. Four patients had device associated thrombus, 1 patient had a bleeding complication, no strokes occurred.

The Amplatzer Cardiac Plug (ACP) (AGA Medical Corp., Golden Valley, MN, USA) is another percutaneously implanted LAAO device that has been used in single and multi-centre studies with low rates of bleeding and thromboembolic complications[14,15]. One of the differences between the ACP and WATCHMAN is that there is no recommendation for anticoagulation immediately post-implant with DAPT used for the first 30–180 days after which aspirin alone is recommended[14,15].

This aim of this study was to report on bleeding and thromboembolic complications post WATCHMAN implantation using a tailored approach to anticoagulation and antiplatelet therapy based on individualised physician assessment of bleeding risk.

Materials and Methods

This study was a retrospective cohort study assessing outcomes in patients undergoing implantation of the WATCHMAN LAAO device. Between November 2009 and May 2015, 53 patients underwent implantation of WATCHMAN LAAO devices at MonashHEART (Monash Health, Melbourne, Australia). Forty-seven of these patients had at least six months of follow-up post implant with the remaining six not yet reaching the six-month mark for follow-up. For these 47 consecutive patients a systematic review of hospital records, follow-up consultations, prescribing records and follow-up telephone interviews was conducted.

The primary outcomes of interest were major bleeding, stroke and systemic embolism. A major bleeding complication was defined as a bleeding event leading to a hospital presentation requiring specialist medical or surgical treatment and/or a change in anticoagulant or antiplatelet therapy. A stroke was defined as a sudden onset focal neurological deficit lasting for at least 24 hours. Systemic embolism was defined as an acute vascular occlusion of an extremity or organ other than the brain.

Baseline patient characteristics, CHA_2DS_2-VASc scores, HAS-BLED scores and indication for LAAO were collected. Major procedural complications, presence of significant peri-device jets (defined as >4 mm on transoesophogeal echocardiography) or device thrombus were also recorded.

Statistical analysis was performed using Stata V12.1 (StataCorp. TX, USA) using means and standard deviations for continuous variables and counts and percentages for categorical variables. Time-to-event analysis was performed using Kaplan-Meier estimates with log-rank test used for between group comparisons. Comparisons were made between groups based upon time to cessation of anticoagulation (<45 days, 45–90 days, >90 days) and DAPT (<45 days, 45–90 days, 90–180 days, >180 days) following implantation.

The study was approved by the institutional human research ethics committee.

Results

Follow-up information was successfully obtained for all 47 patients with baseline characteristics outlined in Table 1. Two patients declined follow-up transoesophogeal echocardiogram (TOE) so could not be assessed for peri-device jets or thrombus.

The mean CHA_2DS_2-VASc and HAS-BLED scores were 4.5 and 3.0 respectively. In 81% of patients (38/47) the indication for LAAO was a major bleeding complication prior to implant. The remaining 19% (9/47) patients underwent the procedure following physician recommendation due to elevated bleeding risk.

Post implant follow-up is summarised in Table 2 with mean duration of follow-up being 2.4 years and total of 111.4 patient-years of follow-up completed. Two patients

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