Periprocedural anticoagulation therapy for devices and atrial fibrillation ablation


Conducted by the Scientific Initiative Committee, European Heart Rhythm Association

1University of Birmingham Centre for Cardiovascular Sciences, City Hospital Birmingham, England, UK; 2Department of Cardiothoracic Science, University Hospital S. Maria della Misericordia, Udine, Italy; 3Second Cardiology Department, Attikon University Hospital, University of Athens, Athens, Greece; 42nd Cardiology Department, University Hospital of Pisa, Italy; 5Isar Heart Center Munich, Munich, Germany; and 6Department of Cardiology, Institution of Medical Science, Uppsala University, Sweden

This EP Wire surveyed clinical practice with regard to the use of antithrombotic therapy in relation to device implantation (pacemakers, ICT, resynchronization therapy) and atrial fibrillation ablation in 71 centres—members of the European Heart Rhythm Association research network. The results of this survey show variation in clinical practice, but reassuringly some consistency with guidelines and consensus recommendations on the management of periprocedure (devices, ablation) antithrombotic therapy.

Keywords Ablation • Anticoagulation • Atrial fibrillation • Devices • Pacemakers

Introduction

Periprocedural use of antithrombotic therapy during electrophysiological procedures was addressed in a position document from the European Heart Rhythm Association in 2006,1 which addressed practice recommendations for peridevice management [e.g. during pacemaker (PPM) implantation] and ablation procedure. Since then, additional developments have included the increasing use of implantable cardioverter-defibrillator (ICD)/cardiac resynchronization therapy (CRT) devices and the requirement for many such patients to have anticoagulation, for example, due to paroxysmal atrial fibrillation. The 2010 European Society of Cardiology guidelines2 also introduced new risk stratification schemes, such as the CHA2DS2-VASc3 and HAS-BLED4 scores, for stroke and bleeding risk assessment, respectively.

The purpose of this EP Wire is to survey clinical practice with regard to the use of antithrombotic therapy in relation to device implantation (PPM, ICT, CRT) and atrial fibrillation ablation.

Devices

The median number of devices implanted in 2011 at the centres surveyed was 445 (range 50–1500), with pacemakers, ICD, and CRT being 263 (42–1000), 100 (0–600), and 70 (0–300), respectively. Of the overall number, a median of 25% (0–70) were on a vitamin K antagonist (VKA), with only a minority (mean 1.6%) on a new oral anticoagulant (OAC) in 2011. A median of 42% (8–90) were on antiplatelet therapy, whereas 30% (2–80) were on no antithrombotic drugs.

In managing a patient on OAC (mostly VKA), common practice was to stop and bridge with heparin in ≈40–45% of patients with ICD/PPM/CRT but 59% of those with prosthetic valves. Oral anticoagulant was stopped for a median of 3 days (range 2–7) and OAC usually restarted on the following day after the procedure of patients with ICD/PPM (60%) or CRT (50%), but 49% of those with prosthetic valves would have their OAC started the same day. If VKA is used, most centres surveyed would use a loading dose, and protamine was not used in any centre surveyed to reverse heparin.

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Many centres would perform the procedure while the patient is still on OAC, PPM/ICD (60%), CRT (50%), or prosthetic valves (57%). If on VKA, the median INR accepted would be 2.5 (range 1.4–4.0) for PPM/ICD, 2.2 (1.4–4.0) for CRT, and 2.5 (1.4–5.0) for prosthetic valves. If the patient had coronary artery disease and a stent (<12 months), most (86–89%) centres would not stop their antiplatelet drug.

Results

Seventy-one multinational centres, the members of the EHRA research network, responded to this survey published on the EHRA website in spring 2012.

* Corresponding author. Tel: +44 (0)121 5075080; fax: +44 (0)121 5544083; Email: g.y.h.lip@bham.ac.uk

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If the patient was on antiplatelet therapy, 78.1% of centres (57 of 73) would not stop their drug, and if they did stop, this would be at a median of 5 days (range 1–7) prior to the procedure.

In patients with AF, 95.8% (70/73) would routinely estimate stroke risk (eg. CHADS2, CHA2DS2-VASc) but the score would influence their antithrombotic regime in 93.1% (68 of 73). In contrast, only 60.3% (44 of 73) would routinely estimate bleeding risk (eg. HAS-BLED score) and this would influence the antithrombotic regime in 54.8% (40 of 73).

For pacemakers, direct cephalic cannulation would be performed by 67.1% (49 of 73) while 32.9% would perform subclavian puncture. The median rate of haemostasis was 5% (range 0–20) for patients on OAC, and 5% (0–15) on antiplatelet therapy. In patients on OAC, 10.7% (5 of 49) would routinely use wound drainage but only 3.6% (2 of 56) routinely used wound drainage in patients not on OAC. The centres reported a median of 0 (range 0–10) coronary sinus perforations in the last year following both guidance and OAC, which would influence their decision on antithrombotic therapy.

Ablation of atrial fibrillation

During ablation of atrial fibrillation, the median ACT used by centres was 350 (range 150–420). Transoesophageal echocardiography (TEE) was performed routinely in 82.5% (47 of 57) of centres, and this was mostly done the day before (63.2%; 36 of 57) or on the same day (35.1%; 20 of 57). Following the AF ablation, OAC was restarted the same day in 65.6% (40 of 61) or the day after in 34.4% (21 of 61). As seen in Table 1, the duration of continuation of OAC post-ablation did vary by stroke risk, whether by CHA2DS2-VASc or CHADS2 score, although some centres did discontinue OAC even in patients at high risk.

Only 31.1% of centres would do an ablation while the patient happened to be taking one of the new OACs (e.g. Dabigatran); however, as mentioned earlier, current uptake was low given the relatively recent approval of dabigatran and rivaroxaban in late 2011. The approximate rate of clinical stroke/thromboembolism reported by centres surveyed was a median of 3% (0–40), and was 2% (0–20) in patients on antiplatelet therapy.

Table 1 How long do you continue OAC post-ablation after an apparently successful procedure?

<table>
<thead>
<tr>
<th>CHADS2 score</th>
<th>Total responses to question</th>
<th>&lt;3 months</th>
<th>3–6 months</th>
<th>6–12 months</th>
<th>Longer than 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1</td>
<td>51</td>
<td>34 (67%)</td>
<td>11 (22%)</td>
<td>3 (6%)</td>
<td>3 (6%)</td>
</tr>
<tr>
<td>≥2</td>
<td>68</td>
<td>0</td>
<td>4 (6%)</td>
<td>7 (10%)</td>
<td>57 (84%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHADS2 score</th>
<th>Total responses to question</th>
<th>&lt;3 months</th>
<th>3–6 months</th>
<th>6–12 months</th>
<th>Longer than 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>49</td>
<td>38 (78%)</td>
<td>10 (20%)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>50</td>
<td>26 (52%)</td>
<td>8 (16%)</td>
<td>6 (12%)</td>
<td>10 (20%)</td>
</tr>
<tr>
<td>≥2</td>
<td>52</td>
<td>0</td>
<td>4 (8%)</td>
<td>3 (6%)</td>
<td>45 (9%)</td>
</tr>
</tbody>
</table>

Figures denote numbers (%). Percentages are rounded to nearest whole figure.

OAC: oral anticoagulation therapy

In approaching an AF patient for ablation, 96.8% (61 of 63) would estimate stroke risk using a risk score (eg CHADS2, CHA2DS2-VASc), which would influence their decision on antithrombotic drug regime in 95.1% (58 of 61). Bleeding risk assessment was routinely done in 57.1% (36 of 63) of centres and this would influence the antithrombotic drug regime in 54.1% (33 of 61) of centres.

Following an ablation procedure, the centres reported that an approximate rate of haemostasis overall in patients on OAC was a median of 3% (0–40), and was 2% (0–20) in patients on antiplatelet therapy.

Discussion

In this EP Wire survey, we have shown wide variation in clinical practice in relation to management of antithrombotic therapy in patients undergoing device implantation and ablation of AF.

In 2008, the Scientific Initiatives Committee of EHRA published a consensus document on antithrombotic therapy in the setting of electrophysiological procedures. This document, the consensus recommendations for catheter ablation of AF advised warfarin for at least 4 weeks prior to the ablation procedure, then to stop warfarin 4–5 days before the ablation procedure. Bridging therapy
with heparin (either low-molecular-weight heparin or unfractionated heparin) was until the day before the ablation procedure. This document did not cover periprocedural management of devices. More contemporary management was reflected in the recent 2012 joint HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation.5

We found that common practice when approaching an anticoagulated patient was to stop OAC and bridge with heparin. Nevertheless, many centres would perform the procedure while the patient is still on OAC. The 2012 HRS/EHRA/ECAS Expert Consensus Statement5 recognized that bridging resulted in a high incidence of bleeding complications, especially at the site of vascular access.6–8 Thus, our EP Wire survey highlights the increasing trend towards performing AF ablation procedures in patients who are continuously therapeutically anticoagulated with warfarin,9–11 Interestingly, protamine was infrequently used to reverse heparin in our survey, but clearly can be considered in cases of persistent periprocedural bleeding or cardiac tamponade.

If the patient had coronary artery disease and a stent (<12 months), most centres would not stop their antiplatelet drug. The management of such anticoagulated patients remains complex, and with concomitant AF, there is a need to balance the prevention of thromboembolism against the reduction of recurrent cardiac ischaemia and/or stent thrombosis, and the risk of serious bleeding.12–14

In patients with AF, most respondents would routinely estimate stroke risk and the score would influence their antithrombotic regime in 93.1% (68 of 73). A smaller proportion (~60%) would routinely estimate bleeding risk (e.g. HAS-BLED score) and this would influence the antithrombotic regime in only 55%. Indeed, a high HAS-BLED score is not a means to stop OAC per se, but to advise caution and/or regular review and to use the opportunity to correct reversible risk factors for bleeding where possible.15

During ablation of atrial fibrillation, TEE was performed routinely by most centres. One interesting practice observation from this survey is the variable the duration of continuation of OAC post-ablation, which did vary by stroke risk, whether by CHA2DS2-VASc or CHADS2 score. Surprisingly, some centres did discontinue OAC even in patients at high risk. The 2010 ESC guidelines5 did recommend long-term anticoagulation in patients with a CHA2DS2-VASc score of ≥2. Similarly, the 2012 joint HRS/EHRA/ECAS Expert Consensus Statement5 advised that ‘discontinuation of warfarin or equivalent therapies post-ablation is not recommended in patients who have a high stroke risk as determined by the CHADS2 or CHA2DS2-VASc score’.

A recent analysis by Chao et al.16 found that the CHA2DS2-VASc score could be used to further stratify the patients with CHADS2 scores of 0–1 into two groups with different event rates (7.1 vs. 1.1%, P = 0.003) at a cutoff value of 2, thus allowing the identification of a patient category who were ‘truly low risk’ post-ablation where OAC can be safely stopped. The approximate rate of clinical stroke/thromboembolism reported by centres surveyed was low, at a median of 1% (range 0–5). This is consistent with a recent large nationwide cohort study showing that patients with a CHADS2 score of 0 were not all ‘low risk’, with 1 year stroke/thromboembolism event rates ranging from 0.84 (CHA2DS2-VASc score = 0) rising to 1.75 (CHA2DS2-VASc score = 1), 2.69 (CHA2DS2-VASc score = 2), and 3.2 (CHA2DS2-VASc score = 3).17 Thus, anticoagulation decisions simply based on a CHADS2 score of 0 may be insufficient to avoid stroke/thromboembolism in patients with AF.

The availability of the new OACs (e.g. dabigatran, rivaroxaban) offers new challenges for devices and ablation.18 Two papers have addressed the subject of ablation while managed with dabigatran. The small series by Winkle et al.19 suggested that a protocol-based management with dabigatran led to safety and efficacy in relation to preventing thromboembolism and a low risk of bleeding. However, another multicentre series reported an increased risk of thromboembolism and bleeding with dabigatran use.20 Only 31.1% of the centres surveyed would do an ablation while the patient happened to be taking one of the new OACs (e.g. dabigatran) pending more experience with these drugs following their recent availability in Europe.

Conclusions

This EP wire survey shows variation in clinical practice, but reassuringly some consistency with guidelines and consensus recommendations on the management of periprocedure (devices, ablation) antithrombotic therapy.

Acknowledgements

The production of this EP Wire document is under the responsibility of the Scientific Initiative Committee of the European Heart Rhythm Association: Carina Blomstrom-Lundqvist (chairman), Maria Grazia Bongiorni, Nikolaos Dagres, Dan Dobreanu, Isabel van Gelder, Thorsten Lewalter, Gregory YH Lip, Philippe Mabo, Germans Marinskis, Laurent Pison, Alessandro Proclemer, Jesper Hastrup Svendsen.

The authors acknowledge the EHRA Research Network centres participating in this EP Wire. A list of the Research Network centres can be found on the EHRA website.

Conflict of interest: none declared.

References

4. Calkins H, Brugada J, Packer DL, Cappato R, Chen SA, Crijns HJ et al. HRS/EHRA/ ECAS Expert Consensus Statement on catheter and surgical ablation of atrial fibrilla-tion: recommendations for personnel, policy, procedures and follow-up: a report of the Heart Rhythm Society (HRS) Task Force on Catheter and Surgical Ablation of Atrial Fibrillation Developed in partnership with the European Heart Rhythm Association (EHRA) and the European Cardiac Arrhythmia Society (ECAS); in collaboration with the American College of Cardiology (ACC), Ameri-can Heart Association (AHA), and the Society of Thoracic Surgeons (STS). Endorsed and Approved by the governing bodies of the American College of
Cardiology, the American Heart Association, the European Cardiac Arrhythmia Society, the European Heart Rhythm Association, the Society of Thoracic Surgeons, and the Heart Rhythm Society. Europace 2007;9:335–7.


