



South Tees Hospitals
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Incidence of left atrial appendage thrombus in patients undergoing AF ablation: Is TOE needed in low risk patients in the NOAC era?

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Outline

- ▶ Stroke risk
- ▶ Risk factors
- ▶ Current guidelines
- ▶ James Cook University Hospital data

Stroke risk

- ▶ Studies have suggested risk of peri-procedural stroke between 0.1-0.8%.¹
- ▶ Asymptomatic cerebral embolism detected by MRI scanning between 7.9%-14.9%.¹
- ▶ Mechanism
 - ▶ Dislodgement of left atrial appendage thrombus
 - ▶ Thrombogenicity of catheters in left atrium
 - ▶ Thrombogenicity of delivering RF ablation and acute lesions

Risk Factors for left atrial appendage thrombus

- ▶ Type of AF – Paroxysmal versus Persistent.¹
- ▶ Left atrial size.¹
- ▶ LVEF.¹
- ▶ CHA₂DS₂-VASc.²

1. McCready JW, et al. *Europace* 2010;12(7):927–932

2. Atkinson C, Hinton J, Gaisie EB, et al. *Echo Research and Practice*. 2017;4(4):45-52.

Incidence of left atrial appendage thrombus

Study	Number of Patients	Anticoagulation	Number of patients with LAA thrombus (%)
Scherr et al 2009. ¹	585	Warfarin/Enoxaparin	CHADS ₂ 0 – 0.4% CHADS ₂ 1 - 1.4% CHADS ₂ 2 – 5.3%
Puwanant et al 2009. ²	1058 patients	Interrupted warfarin	CHADS ₂ 0 – 0% CHADS ₂ 1 – 0.3%, CHADS ₂ 2 – 1%
McCready et al 2010. ³	635 patients	Warfarin/Dalteparin	Overall Incidence 1.9%
Atkinson et al 2017. ⁴	332 patients	Warfarin (94%) NOAC – interrupted	CHA ₂ DS ₂ VASc 0 – 0% CHA ₂ DS ₂ VASc 1 - 0% CHA ₂ DS ₂ VASc 2 – 2%

1. Scherr D, et al. *Cardiovasc Electrophysiol* 2009;20(4):379–384.
2. Puwanant S, et al. *J Am Coll Cardiol* 2009; 54(22):2032–2039
3. McCready JW, et al. *Europace* 2010;12(7):927–932
4. Atkinson C, et al. *Echo Research and Practice*. 2017;4(4):45-52.

Current Guidelines

2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation.

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|--|-----|
| Performance of a TEE in patients who are in AF on presentation for AF catheter ablation and who have been receiving anticoagulation therapeutically for 3 weeks or longer is reasonable. | IIa |
| Performance of a TEE in patients who present for ablation in sinus rhythm and who have not been anticoagulated prior to catheter ablation is reasonable. | IIa |
| Use of intracardiac echocardiography to screen for atrial thrombi in patients who cannot undergo TEE may be considered. | IIb |

Variation in Practice

A survey of the writing group members shows that:

- ▶ 51% perform a TEE in all patients presenting for AF ablation regardless of presenting rhythm and anticoagulation status
- ▶ 71% of the writing group members perform a TEE in patients presenting AF who have been therapeutically anticoagulated for 3 or more weeks prior to ablation
- ▶ Among patients who present for AF ablation in sinus rhythm who have not been previously anticoagulated, 78% of the writing group members routinely perform a TEE

Aim

‘This study aimed to evaluate the incidence of left atrial appendage thrombus in patients undergoing first time AF ablation in the NOAC era and determine whether TOE is required for low risk patients’

Methods

- ▶ Single centre retrospective study
- ▶ Data collected using electronic records
- ▶ Including all patients who underwent AF ablation and had a TOE performed between 1st May 2015 and 11th May 2018
 - ▶ Patients who had multiple ablations during the study period were only included for the first ablation

Results

- ▶ 225 patients underwent AF ablation during the study period
 - ▶ 140 patients did not undergo TOE
 - ▶ 101 patients CHA₂DS₂VASc <2
 - ▶ 39 Patients operator discretion or alternative imaging used (ICE)
 - ▶ 85 patients underwent TOE (37.8%) - (63 male, 22 female), mean age 60 years

Results

- ▶ 72 patients were treated NOACs
 - ▶ 11 patients – uninterrupted dabigatran
- ▶ 13 patients treated with warfarin

Results

CHA ₂ DS ₂ -VASc Score	Number of Patients	Number of Patients with LAA thrombus
0	14	0 (0%)
1 (female status)	1	0 (0%)
1	18	0 (0%)
2	36	1 (2.8%)
3	10	0 (0%)
4	5	0 (0%)
5	1	0 (0%)

Results

- ▶ 1 patient with left atrial appendage thrombus
 - ▶ CHA₂DS₂-VASc – 2
 - ▶ Persistent AF
 - ▶ Dilated left atrium – 4.9cm diameter
 - ▶ Moderate LV impairment
 - ▶ No resolution despite apixaban, rivaroxaban
- ▶ No patients during the study period had a peri-procedural stroke

Conclusions

- ▶ The overall incidence of left atrial appendage thrombus on patients undergoing TOE prior to catheter AF ablation was low (1.2%)
- ▶ No patients during the study period had a peri-procedural stroke
- ▶ No low risk patients with a CHA₂DS₂-VASc score of 0/1 had left atrial appendage thrombus on TOE
 - ▶ Unlike previous literature the majority of patients were on NOACs

Implications for Practice

Although small patient numbers our single centre experience in the NOAC era supports existing literature that routine TOE in low risk patients (CHA₂DS₂-VASc <2) may not be required

References

1. Haeusler K et al. Left atrial catheter ablation and ischaemic stroke . *Stroke*. 2011;43:265-270
2. McCready JW, et al. Incidence of left atrial thrombus prior to atrial fibrillation ablation: is pre-procedural transoesophageal echocardiography mandatory? *Europace* 2010;12(7):927–932
3. Atkinson C, Hinton J, Gaisie EB, et al. Use of the CHA₂DS₂VASc score to reduce utilisation of transoesophageal echocardiography prior to ablation for atrial fibrillation. *Echo Research and Practice*. 2017;4(4):45-52. doi:10.1530/ERP-17-0042.
4. Scherr D, et al. Incidence and predictors of left atrial thrombus prior to catheter ablation of atrial fibrillation. *J Cardiovasc Electrophysiol* 2009;20(4):379–384.
5. Puwanant S, et al. Role of the CHADS2 score in the evaluation of thromboembolic risk in patients with atrial fibrillation undergoing transesophageal echocardiography before pulmonary vein isolation. *J Am Coll Cardiol* 2009; 54(22):2032–2039
6. Calkins H et al 2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. *Heart Rhythm*. 2017;14:e275–e444. doi: 10.1016/j.hrthm.2017.05.012

Questions?

