

Original article

Study of effect of preoperative anti coagulation in case of LA clot

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Abstract:

LA appendage is the most prominent site of LA thrombus formation, with more than 90% of thrombi generating within this anatomical structure.¹ Atrial fibrillation is the most common cardiac arrhythmia and is associated with an increased risk of stroke and thromboembolic complications. Anticoagulant therapy for 3–4 weeks prior to cardioversion is recommended in order to avoid thromboembolic events deriving from restoring sinus rhythm. The transesophageal echocardiogram (TOE) is a diagnostic method that allows a detailed evaluation of the anatomy and function of the left atrial appendage (LAA), and is considered the gold standard for identifying or excluding left atrium (LA) and LAA thrombosis.² The reason for three weeks of anticoagulation before electrical CV derives from a study suggesting that at least 14 days are needed for fibroblastic infiltration and organization of an LAA thrombus.³ Thrombus resolution in previously non-anticoagulated patients can be achieved with either a vitamin K antagonist (VKA) or non- vitamin K antagonist oral anticoagulant (NOAC).⁴ In this study we retrospectively evaluate the effect of preoperative anticoagulation in patients with LA clot with or without atrial fibrillation.

Keywords: LA appendage, Atrial fibrillation

Introduction:

LA appendage is the most prominent site of LA thrombus formation, with more than 90% of thrombi generating within this anatomical structure.¹ Atrial fibrillation is the most common cardiac arrhythmia and is associated with an increased risk of stroke and thromboembolic complications. Anticoagulant therapy for 3–4 weeks prior to cardioversion is recommended in order to avoid thromboembolic events deriving from restoring sinus rhythm. The transesophageal echocardiogram (TOE) is a diagnostic method that allows a detailed evaluation of the anatomy and function of the left atrial appendage (LAA), and is considered the gold standard for identifying or excluding left atrium (LA) and LAA thrombosis.² The reason for three weeks of anticoagulation before electrical CV derives from a study suggesting that at least 14 days are needed for fibroblastic infiltration and organization of an LAA thrombus.³ Thrombus resolution in previously non-anticoagulated patients can be achieved with either a vitamin K antagonist (VKA) or non-vitamin K antagonist oral anticoagulant (NOAC).⁴ In this study we retrospectively evaluate the effect of preoperative anticoagulation in patients with LA clot with or without atrial fibrillation.

Aim:

To study and evaluate the effect of preoperative anti coagulation in cases of mitral stenosis with Left atrial clot

Materials and methods :

- This is a retrospective cross sectional study of all patients undergoing mitral valve replacement in our institute during 2021-2023 for severe mitral stenosis with or without mitral regurgitation with Left atrial clot in preoperative trans thoracic echo evaluation.
- All patients operated for Severe mitral stenosis with LA clot as identified by trans thoracic echo were identified
- Inclusion criteria
 - Ages between 16 – 70 were included
 - Patients with mild to moderate mitral regurgitation were included
 - Patients with isolated mitral regurgitation in absence of stenosis were not included
 - Patients with multiple valve replacement were not included
 - Patients over 40 years underwent CAG evaluation and those found to have CAD were excluded
 - All patients underwent a TEE evaluation intra operatively prior to incision
 - All patients were cleared for surgery by the anaesthesia team
 - Thorough history and clinical evaluation were done prior to selecting the patients
 - Patients with thromboembolic episodes were included and were considered for surgery after recovery from acute embolism and clearance from neurologist
 - Patients with poor pulmonary compliance or those who underwent a previous cardiac surgery were excluded
 - Patients without LA clot preoperatively but on anticoagulation for AF or any other cause are not included
 - All patients received 2.5 mg od dose of warfarin preoperatively with maintenance of inr around 2
- All patients underwent surgery via midline sternotomy and bicaval aortic cannulation

- Cardioplegia used was st Thomas and heart was arrested in diastole
- LA opened through sondergaards groove and MVR done using either metallic or bio prosthetic valve from ST Judes as indicated and available in our hospital
- Cases were shifted to step down icu and anticoagulation, warfarin/ acitrom was started from pod 1 with low molecular heparin cover

Results:

In our study 60 patients with LA clots on preop TTE were considered

Out of 60 patients 48 patients (80%) had a clot on TEE and 12 patients(20%) did not have a clot on TEE

Out of 60 patients 40 patients (66.7%) had a clot intraop whereas 20 patients (33.3%) did not have a clot intraoperatively

Table 1: Patients with LA clot in TEE and OT

		Count	Column N %
TEE clots	Yes	48	80.0%
	No	12	20.0%
Intraoperative Clots	Yes	40	66.7%
	No	20	33.3%

Table 2: patients with a clot in preop echo and no clot in TEE

Count				
		TEE clots		Total
		Yes	No	
Pre-op echo	Yes	48	12	60
Total		48	12	60

out of 48 patients with clot on TEE, 40 patients had a decrease in size of clot and 3 patients had an increase in clot size whereas 5 patients had no change in size

out of 40 patients with clot intraop 32 patients had a decrease in size of clot intra operatively and 5 patients had an increase in size of clot whereas 3 patients had no change in size

Table 3: patients with a clot in preop echo with a decrease in size in TEE and OT

		TEE			
		Decrease	No change	Increase	
Pre-op echo	Yes 60	40	5	3	48
Total		40	5	3	48

		OT			
		Decrease	No change	Increase	
Pre-op echo	Yes 60	32	5	3	40
Total		40	5	3	40

Out of 60 patients with LA clot 48 had a clot on TEE and 12 had no clot on TEE whereas 40 patients had a clot intra op while 20 had no clot in intraop

Table 4: patients with a clot in OT but no clot in preop echo or TEE

			Total	Chi-square	p-value
	Yes	No			
TEE	48	12	60	1.875	0.171
Intraop	40	20	60		

Out of 60 patients with LA clot, 11 patients were on anticoagulation for <3 weeks and out of them 6 patients had a decrease in size of clot on TEE while 5 patients had no change

40 patients were on anticoagulation for >3 weeks and 37 had a decrease in size of clot while 5 patients had no change in size

9 patients were not on any anticoagulation and 2 of them had a decrease in size of clot on TEE while 2 had no change in size and 5 patients had a an increase in size of clot

This shows a statistical significance of anticoagulation on size of clot due to anticoagulation as per TEE

Out of 11 patients on anticoagulation <3 weeks 8 patients had a decrease in size of clot as identified intraop while 1 had increase in size and 2 had no change in size intraop

Out of 40 patients on anticoagulation >3 weeks none had an increase in size of clot while 37 had a significant decrease in size of clot and 3 had no change

Out of 9 patients off anticoagulation 2 had a decrease in size, 3 had an increase in size whereas 4 had no change as seen intraop

Table 6: comparing patients with anticoagulation <3 weeks and >3 weeks by

A. decrease/increase in size of the clot by TEE

		Pre-op Vs TEE			Total	Chi-square	p-value
		Decrease	Increase	No change			
Duration of Anticoagulation (AC)	<=3 weeks	6	0	5	11	41.576	0.001*
	>3 weeks	37	0	3	40		
	No AC	2	5	2	9		
Total		45	5	10	60		

*Statistically significant (p<0.05)

B. decrease/increase in size of the clot in operation

		Pre-op Vs OT			Total	Chi-square	p-value
		Decrease	Increase	No change			
Duration of Anticoagulation (AC)	<=3 weeks	8	1	2	11	22.042	0.001*
	>3 weeks	37	0	3	40		
	No AC	2	3	4	9		
Total		47	4	9	60		

*Statistically significant (p<0.05)

Out of 60 patients with LA clot 11 had preop MACCE ie 18.3 %

Out of these 60 patients,

2 were those on anticoagulation <3 weeks, 5 weere those on anticoagulation > 3weeks

4 patients among 9 who did not receive any anticoagulation had MACCE showing statistical significance

Table 7: Incidence of MACCE in LA clot

		Count	Column N %
MACCE Incidence	Yes	11	18.3%
	No	49	81.7%

Table 8: relation between resolution of LA clot and MACCE in patients on anticoagulation <3 and >3 weeks

		MACCE Incidence		Total	Chi-square	p-value
		Yes	No			
Duration of Anticoagulation (AC)	<=3 weeks	2	9	11	5.008	0.028
	>3 weeks	5	35	40		
	No AC	4	5	9		
Total		11	49	60		

41 out of 48 patients with LA clotso on TEE were in AF rhythm and 12 wew in sinus rhythm showing statistical significance of AF and LA clot

32 out of 40 having intra op LA clots were in AF rhythm and 8 in sinus rhythm

This shows a statistical significance of AF and clot with p value of 0.02

Out of 20 patietns without clots 15 were in sinus rhythm and 5 in AF rhythm

Table 9: Relation of the rhythm of the patient and LA clot formation

		Rhythm		Total	Chi-square	p-value
		Sinus	AF			
Intra-op clots	Yes	8	32	40	4.848	0.028*
	No	15	5	20		
Total		23	37	60		

*Statistically significant (p<0.05)

		Rhythm		Total	Chi-square	p-value
		Sinus	AF			
TEE clots	Yes	12	36	48	2.424	0.019
	No	9	3	12		
Total		21	39	60		

Our study showed a statistical significance of anticoagulation non reduction of LA size with a p value of 0.001 43 of 60 patients on TEE and 44 of 60 patients on intraop findings had a decrease n size of LA clot

Table 10: Efficacy of anticoagulation on clot reduction

		Pre-op Vs TEE			Total	Chi-square	p-value
		Decrease	Increase	No change			
Anticoagulation	Yes	43	0	8	51	32.462	<0.001*
	No	2	5	2	9		
Total		45	5	10	60		

*Statistically significant (p<0.05)

		Pre-op Vs OT			Total	Chi-square	p-value
		Decrease	Increase	No change			
Anticoagulation	Yes	44	1	6	51	20.290	<0.001*
	No	2	3	4	9		
Total		46	4	10	60		

*Statistically significant (p<0.05)

Our study did not show any statistical significance of anticoagulation on reduction of MACCE as the patients with anticoagulation had IC bleeds and those off anticoagulation had ischaemic stroke

Table 11: Efficacy of anticoagulation on clot reduction in patients with MACCE

		Pre-op Vs TEE			Total	Chi-square	p-value
		Decrease	Increase	No change			
Anticoagulation	Yes	3	0	2	5	1.440	0.487
	No	2	1	1	4		

Total	5	1	3	9		
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		Pre-op Vs OT			Total	Chi-square	p-value
		Decrease	No change				
Anticoagulation	Yes	3	2	5	0.090	0.764	
	No	2	2	4			
Total		5	4	9			

Table 12: Efficacy of anticoagulation on clot reduction in patients without MACCE

		Pre-op Vs TEE			Total	Chi-square	p-value
		Decrease	Increase	No change			
Anticoagulation	Yes	40	0	6	46	41.307	<0.001*
	No	0	4	1			
Total		45	4	9	51		

*Statistically significant (p<0.05)

		Pre-op Vs OT			Total	Chi-square	p-value
		Decrease	Increase	No change			
Anticoagulation	Yes	41	1	4	46	27.440	<0.001*
	No	0	3	2			
Total		41	4	6	60		

*Statistically significant (p<0.05)

In our study patients with anticoagulation had more number of adverse effects at 1 year follow up showing statistical significance in MACCE at 1 year postop followup

Table 13: relation of 1-year outcome and anticoagulation in patients <3 weeks and >3 weeks

		Duration of Anticoagulation (AC)			Total	Chi-square	p-value
		<=3 weeks	>3 weeks	No AC			
One year outcome	Yes/ events	2	5	4	11	5.008	0.082
	No MACCE	9	35	5			
Total		11	40	9	60		

Table 14: relation of 1-year outcome and anticoagulation in patients on anticoagulation

		Anticoagulation		Total	Chi-square	p-value
		Yes	No			
One year outcome	Yes/ events	7	4	11	4.822	0.028*
	No MACCE	44	5	49		
Total		51	9	60		

*Statistically significant (p<0.05)

Conclusion

Atrial fibrillation is the most common cardiac arrhythmia and is associated with an increased risk of stroke and thromboembolic complications.

In our study 60 patients with LA clots on preop TTE were considered

Out of 60 patients 48 patients (80%) had a clot on TEE and 12 patients(20%) did not have a clot on TEE

Out of 60 patients 40 patients (66.7%) had a clot intraop whereas 20 patients (33.3%) did not have a clot intraoperatively

Out of 11 patients on anticoagulation <3 weeks 8 patients had a decrease in size of clot as identified intraop while 1 had increase in size and 2 had no change in size intraop

Out of 40 patients on anticoagulation >3 weeks none had an increase in size of clot while 37 had a significant decrease in size of clot and 3 had no change

Out of 9 patients off anticoagulation 2 had a decrease in size, 3 had an increase in size whereas 4 had no change as seen intraop

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Our study did not show any statistical significance of anticoagulation on reduction of MACCE as the patients with anticoagulation had IC bleeds and those off anticoagulation had ischaemic stroke.

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