Burdenko Main Military Hospital

Comparison of visualization of left atrial appendage using intracardiac echocardiography from right atrium and right ventricular outflow tract during atrial fibrillation ablation procedure

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Venice Arrhythmias 2015

Need for visualization

- AF accounts for 15 % of all strokes*
- Stroke and TIA during ablation ≈ 1%**
- Incidence of LA thrombus in AF patients admitted to ablation ≈ 2 %***
- LA thrombus – contraindication for AF Ablation procedures****

*Wolf et al. Stroke. 1991
**Cappato et al. Circulation. 2005
***McCready et al. Europace. 2010
****Calkins et al. Heart Rhythm. 2012

TEE before AF ablation

- TEE is a gold-standard for excluding LAA thrombus with 93%-97% sensitivity and 100% specificity*
- TEE is mandatory for all patients being in AF>48 hours and may be considered in all other patients admitted to AF ablation**

*Koca et al. J Heart Valve Disease 1999
**Calkins et al. Heart Rhythm. 2012

ASE GUIDELINES AND STANDARDS

Guidelines for Performing a Comprehensive Transesophageal Echocardiographic Examination: Recommendations from the American Society of Echocardiography and the Society of Cardiovascular Anesthesiologists

TEE limitations

Table 6 List of absolute and relative contraindications to transesophageal echocardiography

Absolute contraindications	Relative contraindications
• Perforated viscus	• History of radiation to neck and mediastinum
• Esophageal stricture	• History of GI surgery
• Esophageal tumor	• Recent upper GI bleed
• Esophageal perforation, laceration	• Barrett's esophagus
• Esophageal diverticulum	• History of dysphagia
• Active upper GI bleed	• Restriction of neck mobility (severe cervical arthritis, atlantoaxial joint disease)
	• Symptomatic hiatal hernia
	• Esophageal varices
	• Coagulopathy, thrombocytopenia
	• Active esophagitis
	• Active peptic ulcer disease

Hahn et al. J Am Soc Echocardiogr 2013

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TEE complications

Table 7 List of complications reported with TEE and the incidence of these complications during diagnostic TEE and intraoperative TEE[7,24-31]

Complication	Diagnostic TEE	Intraoperative TEE
Overall complication rate	0.18-2.8% (refs 24,25)	0.2% (ref 7)
Mortality	<0.01-0.02% (refs 24,25,27)	0% (ref 7)
Major morbidity	0.2% (ref 27)	0-1.2% (refs 7,28,29)
Major bleeding	<0.01% (ref 24)	0.03-0.8% (refs 7,28)
Esophageal perforation	<0.01 (ref 24)	0-0.3% (refs 7,28,29)
Heart failure	0.05% (ref 28)	
Arrhythmia	0.06-0.3% (refs 7,28,30)	
Tracheal intubation	0.02% (ref 30)	
Endotracheal tube malposition		0.03% (ref 7)
Laryngospasm	0.14% (ref 27)	
Bronchospasm	0.06-0.07% (refs 24,30)	
Dysphagia	1.8 % (ref 31)	
Minor pharyngeal bleeding	0.01-0.2% (refs 24,25,27)	0.01% (ref 7)
Severe odynophagia		0.1% (ref 7)
Hoarseness	12% (ref 31)	
Lip injury	13% (ref 31)	
Dental injury	0.1% (ref 31)	0.03% (ref 7)

Hahn et al. J Am Soc Echocardiogr 2013

ICE – current state

- Controversal data about rate of visualization of LAA
- Is NOT recommended for screening for LA thrombi in high risk patients*
- Transducer position in right heart associated with different visualization rates of LAA**

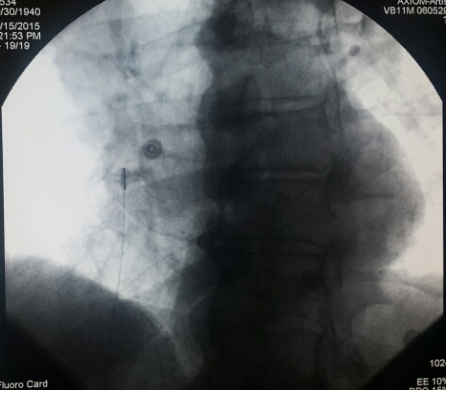
*Calkins et al. Heart Rhythm. 2012
**Baran et al. CAE 2013

AIM OF THE STUDY

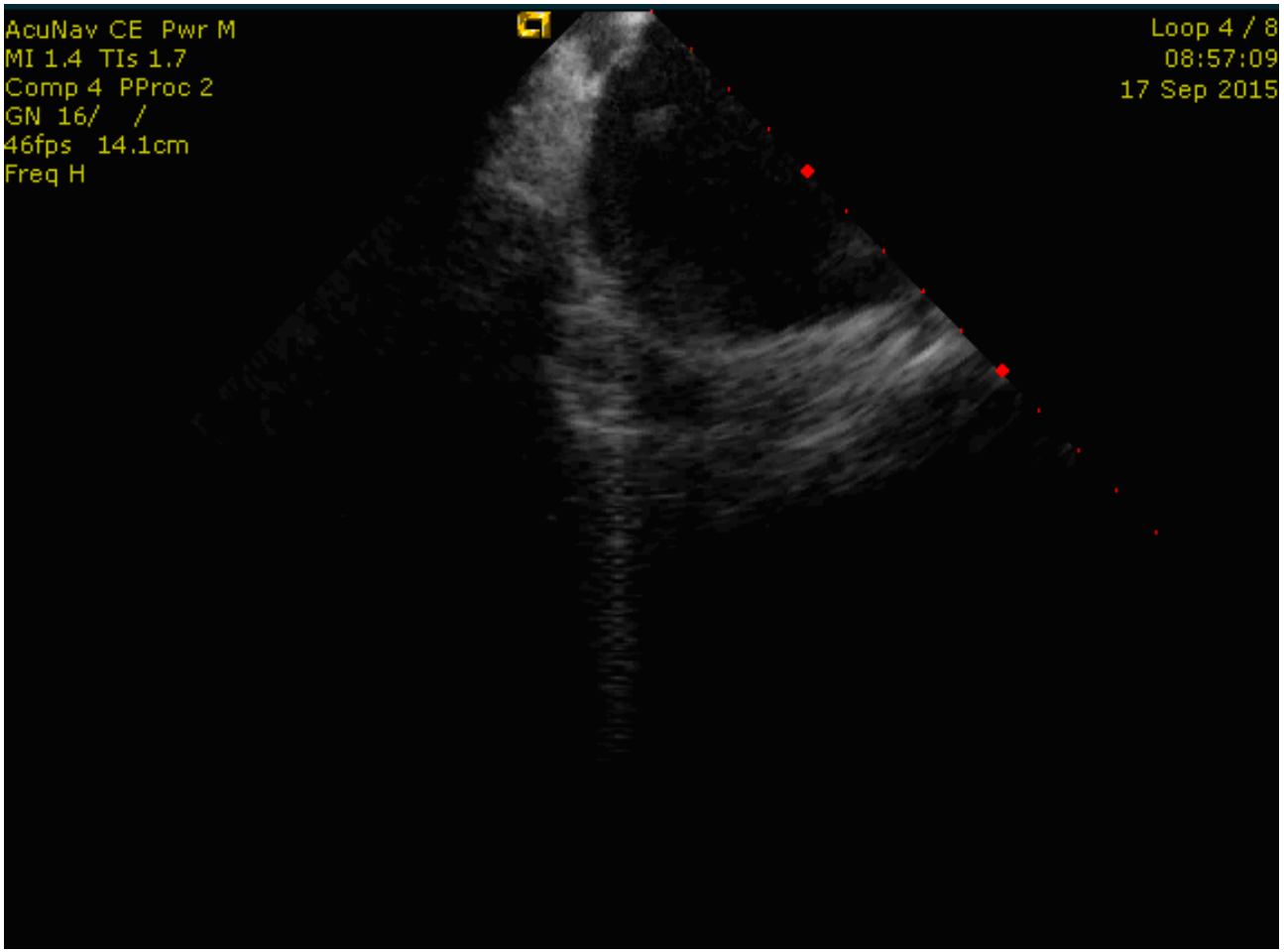
to compare visualization of left atrial appendage (LAA) using intracardiac echocardiography (ICE) from right atrium (RA) and right ventricular outflow tract (RVOT) during atrial fibrillation ablation procedure

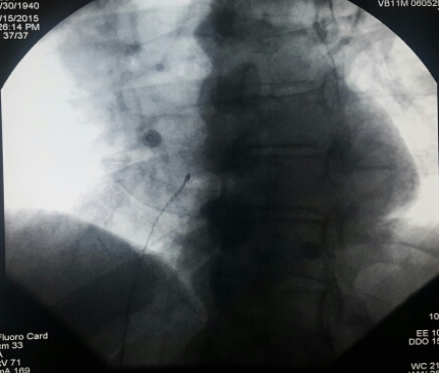
Study population

- 45 patients (38 men) admitted to AF ablation
- mean age 59,6 ± 11,3 years
- 32 patients on sinus rhythm during procedure
- TEE in all patients, patients with LA thrombus excluded

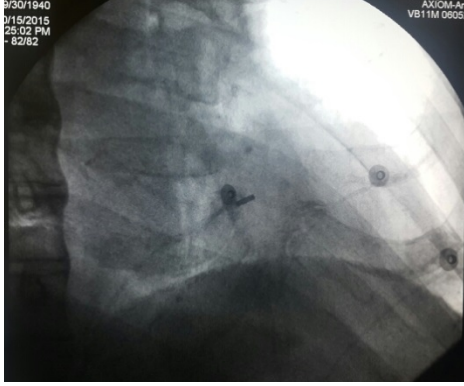


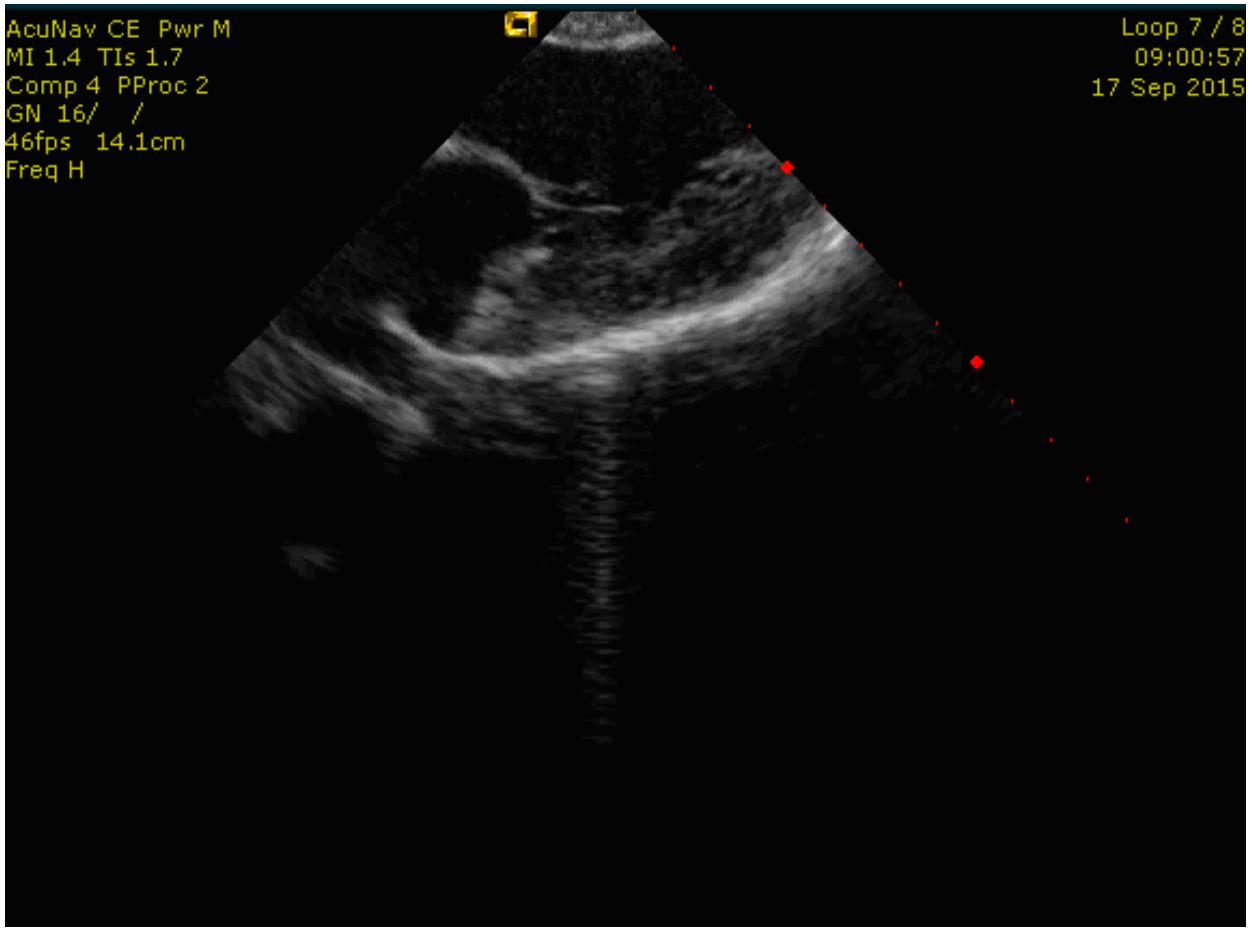
RA visualization





RVOT visualization

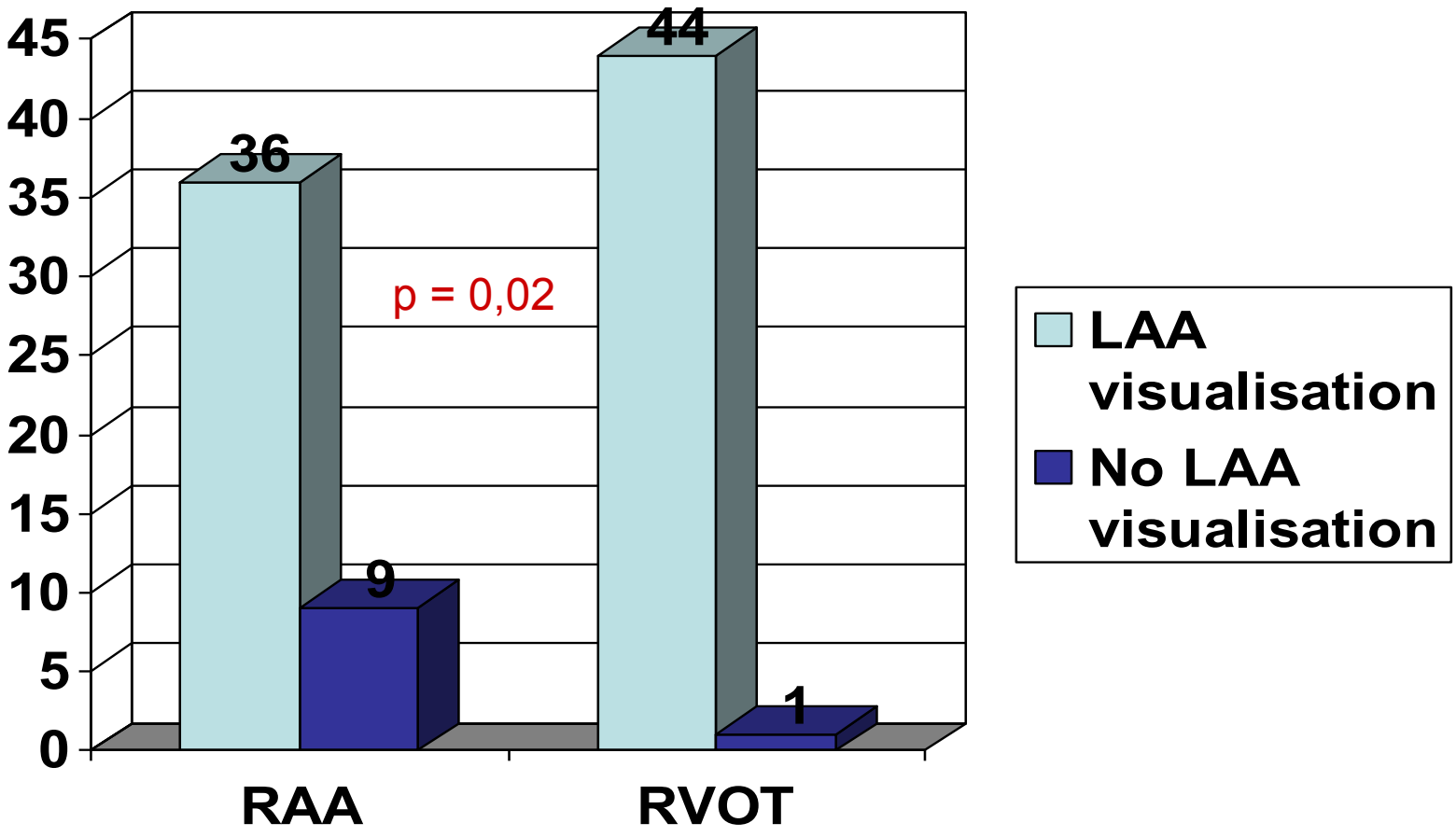




Results

- Mean ICE procedure time was 10,5 ± 6,2 min
- Mean ICE fluoroscopy time was 1,4 ± 1,0 min
- No thrombi, underdetermined by TEE were found in LAA by ICE

LAA visualization rates



Predictors ot RA visualization

Sign	Visualization of LAA from RA - OK	No visualization of LAA from RA	p value
LA size, mm	4,41 ± 0,40	4,49 ± 0,62	0,63
RA size, mm	4,03 ± 0,69	3,99 ± 0,49	0,87
PA pressure, mm Hg	26,23 ± 8,75	28,33 ± 4,58	0,49
LV EDS, mm	5,63 ± 0,60	5,48 ± 0,39	0,48
MMI, g	107,57 ± 18,09	103,67 ± 15,63	0,63
LV EF, %	64,79 ± 7,69	65,33 ± 3,77	0,84

CONCLUSION

Probability of appropriate visualization of left atrial appendage from right ventricular outflow tract is statistically significantly higher, then from right atrium

THANK YOU FOR YOUR ATTENTION