Impact of ultrasound contrast agent on the detection of thrombi during transesophageal echocardiography

Tables

Tab.1: Inclusion und exclusion criteria for the CONDOR study

Inclusion criteria:
• Established diagnosis of non-valvular atrial fibrillation (paroxysmal, persistent, or permanent)
• Age >= 18 years
• clinical indication for TEE due to a planned intervention (cardioversion, LAAC, or ablation)
• written informed consent
Exclusion criteria:
• contraindication regarding TEE (acute esophageal lesions, esophageal diverticle etc.)
• contraindication regarding the use of UCA
• known allergy to UCA or any of the agents used during routine TEE (midazolame, lidocaine)
• history of previous LAA closure (interventional or surgical)
• severe intracardiac right-to-left shunt
• severe pulmonary hypertension (sPAP > 90mmHg)
• acute respiratory distress syndrome

Tab. 2: Characteristics of study patients (N=223; baseline)

Parameter	Value
age [years]	71.3 +/- 9.9
male gender	122 (54.7%)
height [cm]	170.4 +/- 10.2
weight [kg]	87.5 +/- 21.2
CHA2DSVASc-Score	3.6 +/- 1.5
HASBLED-Score	1.7 +/- 1.2
LV-EF [%]	51.7 +/- 14.0
eGFR [ml/min*1.73m2]	69.8 +/- 23.1
type of atrial fibrillation paroxysmal persistent permanent	 71 (31.8%) 123 (55.1%) 29 (13.0%)
hypertension	200 (89.7%)
diabetes	85 (38.1%)
previous stroke	31 (13.9%)
CAD	50 (22.4%)
previous MI	26 (22.4%)
previous cardioversion	17 (7.6%)
chronic heart failure no heart failure NYHA I NYHA II NYHA III NYHA IV	 108 (48.4%) 31 (13.9%) 22 (9.9%) 51 (22.9%) 11 (4.9%)

antithrombotic medication		
aspirin	16	(7.2%)
clopidogrel	8	(3.6%)
ticagrelor	1	(0.4%)
prasugrel	3	(1.3%)
VKA	29	(13.0%)
dabigatran	4	(1.8%)
rivaroxaban	63	(28.3%)
apixaban	21	(9.4%)
edoxaban	39	(17.5%)

LV-EF: left ventricular ejection fraction; eGFR: estimated glomerular filtration rate; MI: myocardial infarction; CAD: coronary artery disease

Tab. 3: Frequency of thrombi in the left atrial appendage according to TEE.

		thrombus without UCA			
		yes	no	uncertain	total
thrombus with UCA	yes	12	2	2	16
	no	2	150	27	179
	uncertain	3	2	23	28
	total	17	154	52	223

p<0.01 (Stuart-Maxwell test). UCA: ultrasound contrast agent

Tab. 4: Direction of change in diagnosis after administration of UCA (N = number of cases).

no change	185 (83.0%)
“thrombus present” to “no thrombus”	2 (0.9%)
“thrombus present” to “inconclusive result”	3 (1.3 %)
“no thrombus” to “thrombus present”	2 (0.9%)
“no thrombus “ to “inconclusive result”	2 (0.9%)
“inconclusive result” to “thrombus present”	2 (0.9%)
“inconclusive result” to “no thrombus”	27 (12.1%)

p<0.01 (Stuart-Maxwell test)

Tab. 5: Feasibility of subsequently planned procedures according to TEE result.

	precedure feasable	precedure to be postponed
no UCA	158 (70.9%)	65 (29.1%)
with UCA	183 (82.1%)	40 (17.9%)

p<0.01 (McNemar)

Tab. 6: Direction of change regarding the feasibility of planned procedures after administration of ultrasound contrast agent during TEE.

no change	194 (87.0%)
“feasible” to “to be postponed”	2 (0.9%)
“to be postponed” to “feasible”	27 (12.1%)

P<0.01 (McNemar)

Tab. 7: Patient status at end of the study (hospital discharge).

discharged home	223 (100%)
any procedure performed	167 (74.9%)
cardioversion	58 (26.0%)
ablation	66 (29.6%)
LAA closure	50 (22.4%)
antithrombotic medication	
aspirin	62 (27.8%)
clopidogrel	53 (23.8%)
ticagrelor	2 (0.9%)
prasugrel	3 (1.3%)
VKA	19 (8.5%)
dabigatran	2 (0.9%)
rivaroxaban	62 (27.8%)
apixaban	28 (12.6%)
edoxaban	52 (23.3%)
TIA	1 (0.4%)
stroke	0
syst. embolism	0
death	0