

Preoperative atrial fibrillation is a risk factor for concealed impairment of myocardial function and increased postoperative morbidity in patients undergoing CABG

Bening C, Yaqub J, Mazalu E-A, Alhussini K, Hamouda K, Schade I, Schimmer C, Leyh R



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Background

- ▶ Up to 6% of patients scheduled for CABG present with preoperative atrial fibrillation (Afib)
- ▶ Afib is associated with
 - ▶ *Increased perioperative morbidity*
 - ▶ *Increased perioperative mortality*
 - ▶ *Decreased long-term survival*
- ▶ EuroSCORE II omits Afib as a modifier of potential risk, leaving the impact of preoperative Afib on postoperative mortality unaccounted for
- ▶ The link between Afib and myofilament function in patients undergoing CABG remained unspecified, until now
- ▶ Human studies compounding myofilament function with clinical parameters were lacking, until now

Patients

- ▶ n=215 patients scheduled for elective CABG between 08/2016 – 03/2018
- ▶ Patients were divided into two groups according to their preoperative heart rhythm
 - ▶ SR group; n=191 patients in preoperative sinus rhythm
 - ▶ Afib group; n=24 patients with preoperative Afib
- ▶ Collection of right and left atrial tissue samples for calcium-induced skinned fiber force measurement as a “*canonical functional probe of the intrinsic myocardial regulatory complex*”

Results I: Patient characteristics and clinical data

	Group SR (191)	Group Afib (24)	p
Age (years)	67.53 ± 9.81	73.05 ± 7.4	0.001
Female (%)	33(17)	3 (12)	0.04
sPAP (mmHg)	27.9 ± 4.6	30.8 ± 6.7	0.04
EuroSCORE II	3.3 ± 0.76	1.9 ± 0.34	0.03
TAPSE (mm)	23.3 ± 3.7	18.6 ± 3.9	0.001
RA area	15.1 ± 4.1	21.8 ± 8.7	0.001
LA area	19.4 ± 4.9	27.9 ± 7.2	0.001
Preop proBNP	934.3 ± 256	1621 ± 456	0.01
Ventilation time (h)	11.5 ± 2.4	16.3 ± 3.6	0.03
Postop LCOS (%)	3 ± 1.2 (1.6)	5 ± 2.6 (21)	0.01
ICU stay (days)	1.9 ± 0.5	3.1 ± 1.2	0.01
Hospital stay (days)	11.2 ± 2.1	14.2 ± 3.4	0.04
Inhospital mortality (%)	4 (2.1)	5 (20.8)	0.01

PVD, peripheral vascular disease; IDDM, insulin-dependent diabetes mellitus; sPAP, systolic pulmonary artery pressure; GFR, glomerular filtration rate; LVEF, left ventricular ejection fraction; LCOS, low cardiac output syndrome; CCU, critical care unit

Results II

LAA pCa	Group SR	Group Afib	p
LAA pCa 4.52	0.97 ± 0.38 mN	0.75 ± 0.29 mN	0.001
LAA pCa 4.75	0.98 ± 0.38 mN	0.75 ± 0.28 mN	0.001
LAA pCa 5.0	0.90 ± 0.37 mN	0.68 ± 0.27 mN	0.001
LAA pCa 5.1	0.88 ± 0.35 mN	0.67 ± 0.25 mN	0.001
LAA pCa 5.2	0.79 ± 0.33 mN	0.60 ± 0.24 mN	0.001
LAA pCa 5.3	0.67 ± 0.29 mN	0.52 ± 0.22 mN	0.001
LAA pCa 5.4	0.56 ± 0.26 mN	0.45 ± 0.21 mN	0.008
LAA pCa 5.5	0.41 ± 0.23 mN	0.34 ± 0.19 mN	0.04

RAA pCa	SR	AF	p
RAA pCa 4.52	0.75 ± 0.36 mN	0.62 ± 0.31 mN	0.036
RAA pCa 4.75	0.76 ± 0.34 mN	0.63 ± 0.30 mN	0.035
RAA pCa 5.0	0.68 ± 0.32 mN	0.57 ± 0.28 mN	0.042

Tables depict significant differences in calcium-induced left atrial (LAA) and right atrial (RAA) myofilament force measurements across the gamut of calcium concentrations

Conclusions

Based on these preliminary results, we conclude that

- ▶ preoperative Afib in patients undergoing CABG is associated with
 - ▶ *A reduced right and left atrial contraction*
 - ▶ *a higher postoperative morbidity*
 - ▶ *a significantly longer in-hospital stay*
- ▶ Risk prediction scores for cardiac surgery should include preoperative Afib as an independent risk modifier
- ▶ Larger studies are necessary to verify these results