

Endo-balloon versus trans-thoracic aortic clamping in mini-thoracotomy mitral valve repair: outcome on myocardial protection

Background / Study Objective



Perfusion strategies and aortic clamping techniques for mitral valve surgery via right mini-thoracotomy have evolved with remarkable short- and long-term results.

However, concerns have been raised about the adequacy of myocardial protection in relation to different techniques of aortic clamping.

Aim of this study was to compare the efficacy of myocardial protection in patients undergoing right mini-thoracotomy mitral repair with endo-aortic (EAC) or trans-thoracic aortic clamping (TTC).

Mitral repair via right mini-thoracotomy with retrograde arterial perfusion and EAC or TTC

Exclusion criteria:

- age > 75 years
- ejection fraction < 40%
- previous CABG or concomitant indication for coronary revascularization
- severe peripheral vascular disease
- concomitant ablation for atrial fibrillation
- non-elective operation
- conversion to sternotomy
- antegrade arterial perfusion

Methods

Single center, prospective observational study

566 patients underwent mitral repair via right mini-thoracotomy (2014 – 2018)

116 ENROLLED

450 EXCLUDED

64 EAC

52 TTC

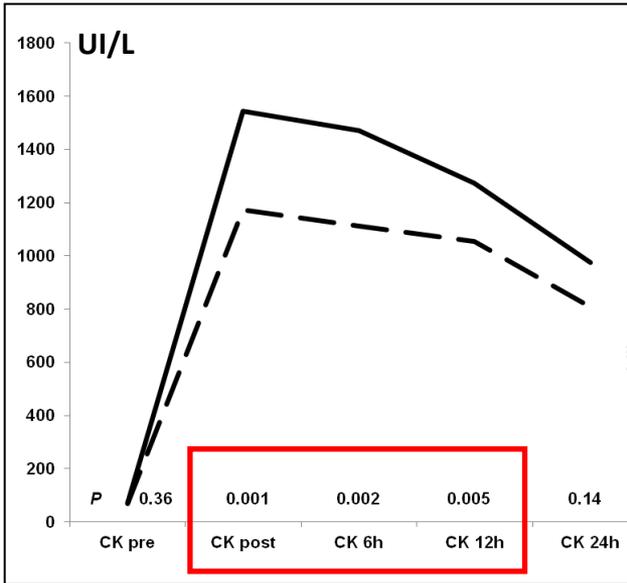
Myocardial protection efficacy was compared between the 2 groups by assessing serum CK, CK-MB, and Troponin T immediately after aortic unclamping and 6, 12, and 24 hours thereafter.

Results 1

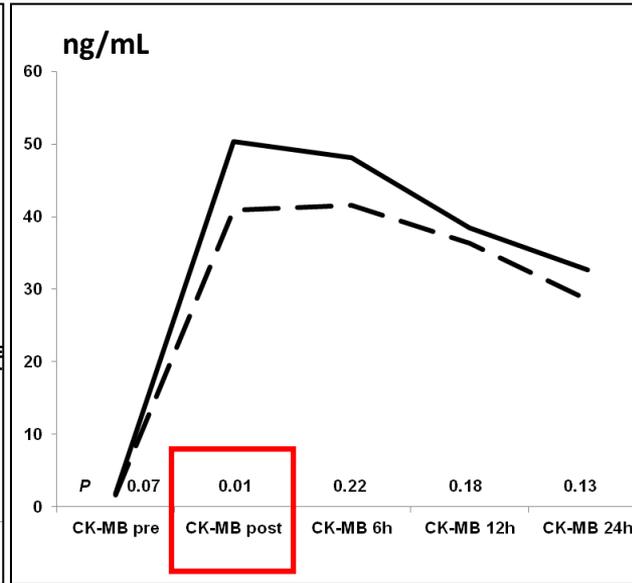
Variables	EAC (n=64)	TTC (n=52)	p
Age years, mean (SD)	53.8 (10.8)	61.9 (8.8)	<0.001
Female , n (%)	19 (29.7)	18 (34.6)	0.66
BMI kg/m ² , mean (SD)	23.8 (3.5)	23.5 (3.3)	0.83
Atrial fibrillation , n (%)	3 (4.7)	3 (5.8)	0.87
Creatinine mg/dL, median (Q1-Q3)	0.9 (0.2)	0.9 (0.2)	0.87
Diabetes , n (%)	0	1 (1.9)	0.99
Ejection fraction %, median (Q1-Q3)	63.4 (7)	63.1 (9.1)	0.86
Previous cardiac surgery , n (%)	2 (3.1)	0	0.99
Complex mitral repair , n (%)	32 (50)	24 (46.2)	0.82
Tricuspid surgery , n (%)	2 (3.1)	3 (5.8)	0.81
ASD closure , n (%)	7 (10.9)	8 (15.4)	0.67
CPB min, median (Q1-Q3)	124.5 (115.5-144)	132 (116.5-143.2)	0.53
Aortic clamping min, median (Q1-Q3)	99.4 (89.7-112)	99.4 (89.7-112)	0.71
Custodiol cardioplegia , n (%)	62 (96.9)	48 (92.3)	0.49
CPB pressure mmHg, median (Q1-Q3)	60 (55.7-65.2)	64.4 (60-69.3)	<0.001
Stroke , n (%)	1 (1.6)	0	0.99
Myocardial infarction , n (%)	0	0	0.99
Dialysis , n (%)	0	0	0.99
Postoperative creatinine mg/dL, median (Q1-Q3)	0.8 (0.2)	0.8 (0.2)	0.62
Hospital stay days, median (Q1-Q3)	3.9 (3.9)	6.8 (4.5)	0.53
30-day mortality , n (%)	0	0	0.99

Results 2

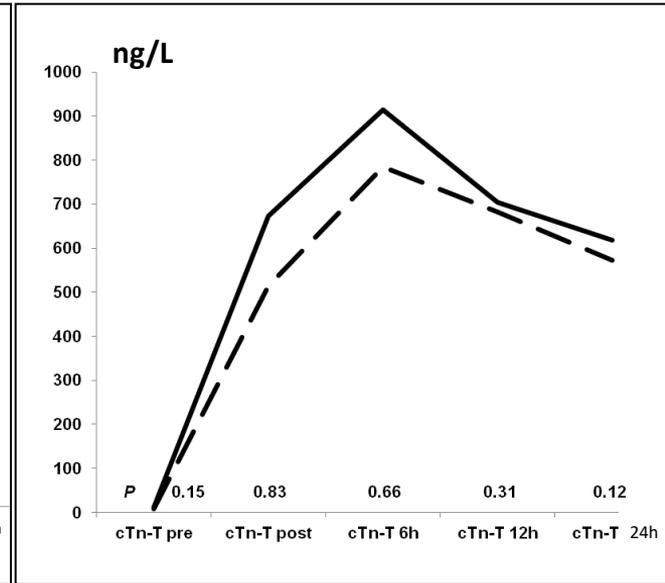
CK (ref limit <190 UI/L)



CK-MB (ref limit < 5ng/mL)



cTnT (ref limit < 5ng/mL)



CK and CK-MB were significantly lower in the EAC group, whereas TnT levels were lower, but not significantly different

--- EAC
— TTC

Conclusion

Despite the concerns raised about EAC, this prospective study shows:

- **equivalent overall outcome** and safety of EAC
- **potential for better myocardial protection** and arterial perfusion with EAC
compared to TTC