

Long term outcome of patients with chronic refractory angina treated by cardiac shockwave therapy

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Background: Patients with chronic refractory angina pectoris (CRAP) without revascularization options experience continued symptoms despite maximal medical therapy. Cardiac shockwave therapy (CSWT) stimulates the zones of myocardial ischemia with acoustical energy and might improve symptoms and decrease ischemia burden by stimulating collateral growth in chronic ischemic myocardium. Short term effects of CSWT are promising but long-term effects are not known.

Purpose: To assess the long term outcome of patients with CRAP treated by CSWT.

Methods: Patients with CRAP and reversible ischemia on myocardial perfusion scintigraphy were treated with CSWT, applied to the ischemic zones (100 impulses/spot, 0.09 mJ/mm²) in an echocardiography-guided and ECG-triggered fashion.

Results: 103 patients were treated with CSWT. Baseline characteristics, comorbidities and medication are shown in the table. During a mean follow-up of 4.58±0.21 year, 22 (21%) patients died. Unadjusted Kaplan-Meier survival rates were 94±2% and 89±3% at 1 and 3 years, respectively (Figure). From the 81 surviving patients 37 visited the emergency room and 48 patients were hospitalized due to cardiac complaints, of which 24 patients underwent additional revascularization.

Conclusion: On the long term, 74% of patients with CRAP treated by CSWT have limited anginal complaints (CCS class I -II). Mortality rates in these patients compared favourably with results of 2 large registries (OPTIMIST and Duke Database of Cardiovascular Disease), taking into consideration the older age of CSWT-treated population (67 vs 63 years).

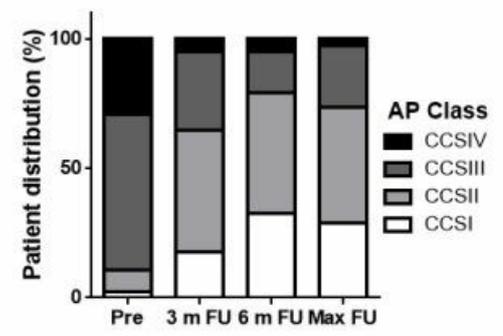
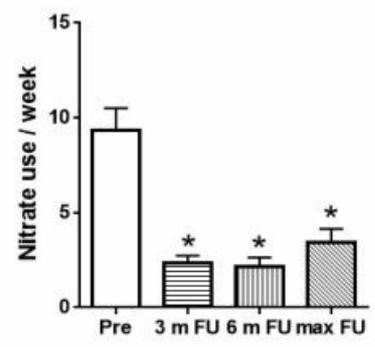
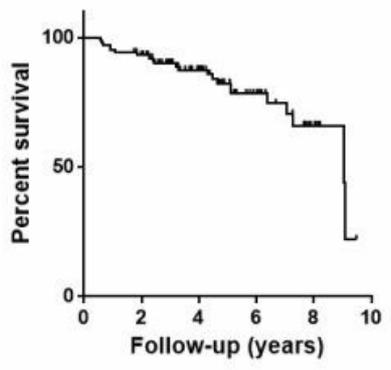
Baseline characteristics and follow-up

Baseline characteristics (n=103)		Medication (n=103)	
Age (years)	67.42±0.86	Aspirin	75%
Female (%)	21%	Clopidogrel	43%
BMI	29.22±0.46	Oral anticoagulation	19%
EF (%)	53.48±1.15	Nitrates	94%
Smoking	17% (16/94)	Beta-blockers	89%
NYHA I-IV	I: 26%, II: 55%, III: 17%, IV: 1%	Calcium antagonists	66%
Comorbidities (n=103)		ACE inhibitors/ARBs	69%
Diabetes mellitus	41%	Follow-up	
Hypercholesterolemia	86%	Duration (years)	4.58±0.21
Hypertension	79%	Survival (1 y/3 y)	94±2%/89±3%
COPD	11%	Cardiac hospitalizations	59% (48/81)
Peripheral vascular disease	22%	Emergency room visits	46% (37/81)

Survival

Nitrate use

Angina pectoris class distribution



Follow up