Temporary percutaneous left ventricular stimulation in patients with cardiogenic shock and asynchronous left ventricular contraction

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Background

- Despite modern technologies (revascularization, IABP, assist) cardiogenic shock is still associated with a high mortality
- Cardiac resynchronization therapy (CRT) is able to improve hemodynamics, symptomaticity and mortality of pts. with severely impaired LV-EF and asynchronous left ventricular contraction
- In the present study CRT was used as a temporary treatment strategy in patients with cardiogenic shock for the first time

Methods

- 15 pts. with severely impaired LV-EF of different origin
- Cardiogenic shock (catecholamine dependency, lactate†)
- Standard therapy unsuccessful or contraindicated (IABP, assist…)
- Asynchronous left ventricular contraction (AEP, PEP, SPWMD)
- Puncture of the right jugular vein
- Intubation and angiography of the coronary sinus
- Placement of a left ventricular lead (Quicksite, SJM)
- Stimulation through an externally connected re-sterilized pacemaker
**Patient 1 – LV-VVI**

- 61 year old man, CAD, EF 20%, dual chamber ICD
- SR, AV III*, no intrinsic rhythm; Echo: AEP 140 ms, PEP 85 ms
- dyspnoea NYHA III-IV, deterioration into cardiogenic shock
- upgrading on CRT delayed due to urosepticemia

**Patient 2 – LV-VVI**

- 67 year old man, CAD, EF 30%, dual chamber ICD, NYHA III
- SR, AV III*, no intrinsic rhythm; Echo: AEP 160 ms, PEP 100 ms
- ICD infection, explantation; cardiogenic shock with RV-VVI
- temporary LV stimulation until re-implantation of CRT-ICD

**Patient 3 – LV-VVT**

- 64 year old man, CAD, anterior MI and CABG 1997
- deteriorating dyspnoea and lower limb edema
- SR, PQ 180 ms, QRS 120 ms, left anterior hemiblock
- Echo: EF 16%, MI II, AI II, AEP 155, PEP 110
Patient 4 – RA/LV-DDD

- 57 y., woman, sudden development of deteriorating heart failure
- EF 10%, severe cardiogenic shock (myocarditis?)
- multi organ failure, perforated gastric ulcer (assist device rejected)
- SR, 150/min, QRS 120 ms, Echo: AEP 80 ms, PEP 40 ms
Patient 4 – RA/LV-DDD
Echo 6 weeks later – no LV stimulation

Summary
• Temporary percutaneous LV stimulation during cardiogenic shock is technically feasible
• Possibly, that approach carries the chance to improve these severely ill patients hemodynamically
• Initial clinical experiences appear promising
• It seems important to maintain AV synchronicity
  – VVT programming
  – additionally temporary RA lead
  – LV-VDD lead ?