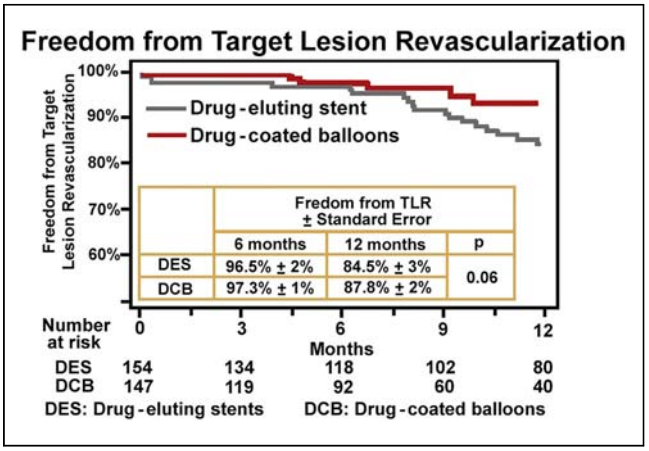
p=0.23). The DES-treated group was older (69.1 +/- 11.2 years vs 68.9 +/- 13.2 years, p= 0.045) and had more patients with prior or active smoking history (81.7% vs 52.7%, p <0.001). Lesion and procedural characteristics are presented in the table. Freedom from target lesion revascularization (TLR) to one year was similar between treatment groups (figure) despite a 3.2% stent thrombosis rate in the DES-treated group.



	Drug eluting stents (n=154)	Drug coated balloons (n=147)	p
Rutherford class 4-6	36%	28.4%	0.2
Urgent procedures	6.2%	5.5%	0.7
TASC II class C or D	31.1%	31.8%	0.9
Popliteal target lesion	22.1%	27.9%	0.2
Lesion length (mean ± SD)	12.6 ± 7.7 cm	11.1 ± 6.9 cm	0.18
Severe calcification	18.5%	13.5%	0.3
Total occlusion	36.4%	17.0%	<0.001
In-stent restenosis	16.9%	27.9%	0.022
<2 patent runoff vessels	32.9%	34.1%	0.9

CONCLUSION Overall results show similar TVR- free survival at 1 year with a trend toward better TVR in DCB-treated lesions. Stent thrombosis may account for early increase in TLR in DES-treated lesions.

CATEGORIES ENDOVASCULAR: Peripheral Vascular Disease and Intervention

HEMODYNAMIC SUPPORT OF CARDIOGENIC SHOCK: PROGNOSIS, DEVICES AND ECMO

Abstract nos: 21 - 24

TCT-21

Door-to-ECMO before Door-to-Balloon? Early Implementation of ECMO might improve the Survival of Patients with STEMI Complicated by Refractory Cardiogenic Shock

Chi-Cheng Huang,[1] Pen-Chih Liao,[2] Shin-Rong Ke,[3] Jung-Cheng Hsu[4]
[1]Far Eastern Memorial Hospital, Taipei City, Taiwan; [2]Far Eastern Memorial Hospital, New Taipei City, Taiwan, Taiwan; [3]Far Eastern Memorial Hospital; [4]Far Eastern Memorial Hospital, Taipei, Taiwa

BACKGROUND Refractory cardiogenic shock (RCS) represents the extremely-ill patients with STEMI, whose mortality rate was >60%. Despite the efforts to decrease door-to-balloon (D2B) time in the past decade, recent studies reported little progress on mortality of these patients. Meanwhile, early mechanical support such as ECMO has shown some favorable results when combined with primary PCI. D2B time delayed by ECMO has been a concern, but few studies addressed it.

METHODS From January 2005 to December 2014, 1969 patients presented with STEMI received emergent cardiac catheterization; revascularization was conducted by PCI or CABG as appropriate. ECMO was performed for 46 patients with RCS, defined as SBP <90mmHg under inotropes, refractory ventricular arrhythmia, or cardiac arrest. Demographic, hemodynamic, and angiographic data were collected retrospectively. Comparison was made between patients whose ECMO were set up before (N=12) and after (N=34) the cardiac catheterization.

RESULTS Between two groups, there was no difference in age (before vs. after, 56.9 vs.57.5), male gender (91.7% vs. 85.3%), calendar year, GRACE score (median, 178 vs. 184), BP at ED (84/47 vs. 97/59) or before ECMO (50/34 vs. 58/32), number of diseased vessels (mean, 2.5 vs. 2.4), complete revascularization during PCI (41.7% vs. 23.5%, p=0.276), and TIMI 3 flow after PCI (81.8% vs. 56.0%, p=0.453). Patients with ECMO performed before PCI had a lower door-to-ECMO time (median 63 vs. 609 mins, p=0.019) and a nonsignificant longer D2B time (145 vs.115 mins, p=0.469); however, they had a significantly better 6-month survival (58.3% vs. 14.7%, p=0.006). After adjusting for gender, GRACE and D2B time, ECMO implemented before the cardiac catheterization is independently associated with 6-month survival (OR = 7.03 [95% CI 1.10-44.00], p= 0.039). All except 1 survivor had good neurological output.

CONCLUSION Our data demonstrated a strong association between early ECMO implementation and survival in STEMI patients with RCS. Unlike previous studies, our finding highlights a new hypothesis - should we pause for ECMO before rushing for the D2B time? RCT is strongly needed to examine these results.

CATEGORIES CORONARY: Acute Myocardial Infarction

TCT-22

Dual Mechanical Support Combining Impella Microaxial Pump and Veno-arterial ECMO Rescues High-risk Patients in Refractory Cardiogenic Shock

Joern Tongers,[1] Jan-Thorben Sieweke,[1] L Christian Napp,[1] Florian Zauner,[1] Dominik Berliner,[1] Christian Kühn,[2] Axel Haverich,[2] Johann Bauersachs,[1] Andreas Schäfer[1]
[1]Department of Cardiology and Angiology, Hannover Medical School, Hannover, Germany; [2]Department of Cardiothoracic, Hannover Medical School, Hannover, Germany

BACKGROUND Despite advances in management of cardiogenic shock (CS), its mortality remains unacceptably high particularly if refractory. The evolving field of mechanical support including extracorporeal membrane oxygenation (ECMO) and Impella microaxial pump has revolutionized treatment strategies. However, questions regarding mechanical support such as timing and management remain elusive. Experience in the combination of ECMO and Impella intending on biventricular unloading are lacking.

METHODS In our single-center registry, 55 consecutive patients with refractory CS received dual mechanical support using Impella and veno-arterial (VA) ECMO (female-male 18/82%, age 53±2 yrs). Cardiogenic shock resulted from cardiomyopathy (40%), STEMI (17%), NSTEMI (7%), and arrhythmia (15%). During the ICU-course patients were critically ill: e.g. 93% mechanical ventilation, 53% dialysis, 38% resuscitation. Impella and VA ECMO were inserted and removed percutaneously via femoral access (duration of dual support: 107±72 hrs).

RESULTS The length of ICU-/in-hospital stay was 12±2 and 27±5 days. On mechanical support, hemodynamics stabilized, while use of catecholamines could be saved (dobutamine: BL 5.6±4.2, 24-hrs 2.9±3.1, 72-hrs 2.2±2.7 mg/kg/min, p<0.0001 vs. BL; norepinephrine BL 0.5±0.6, 24-hrs 0.2±0.3, 72-hrs 0.2±0.3 mg/kg/min, p<0.0001 vs. BL). Reflecting the microcirculation, lactate levels normalized over time (BL 8.5±6.4, 24-hrs 2.4±1., 72-hrs 2.1±2.4 mmol/L, all p<0.05 vs. BL). Despite the negative selection of CS patients with a historically devastating prognosis, in-hospital survival in our fragile population was 42%. While 19 patients were bridged to recovery, 13 patients were bridged to VAD-implantation. After its successful weaning mechanical support had not to be reinstalled in any patient. The safety profile of dual support was reasonable (e.g. 11% DIC, 7% leg ischemia, 7% stroke, 6% compartment). Vascular access site problems occurred in only 3 patients.

CONCLUSION In conclusion, the concept of dual mechanical support using Impella microaxial pump combined with VA ECMO for biventricular unlading in refractory CS is feasible and efficient in stabilizing and rescuing patients at highest risk.

CATEGORIES CORONARY: Hemodynamic Support and Cardiogenic Shock

TCT-23

Contemporary Trends in Utilization of Mechanical Circulatory Support in Patients Hospitalized After Out-of-Hospital Cardiac Arrest

Nileshkumar Patel,[1] Nish Patel,[2] Gabriel Hernandez,[3] Shilpkumar Arora,[4] Apurva Badheka,[5] Abhishek Deshmukh,[6] Eduardo DeMarchena,[7] Mauricio Cohen,[8] Carlos Alfonso,[9] Deepak Bhatt,[10] Navin Kapur[11]
[1]University of Miami, MIAMI, Florida, United States; [2]University of Miami Miller School of Medicine, Miami, Florida, United States; [3]Novosibirsk State Research Institute of Circulation Pathology; [4]Mount Sinai st luke's roosevelt, New York, New York, United States; [5]Yale university, New haven, Connecticut, United States; [6]UAMS erwqeqweqw, little rock, Arkansas, United States; [7]University of Miami, Miami, Florida, United States; [8]University of Miami Hospital, Miami, Florida, United States; [9]University of Miami Miller School of Medicine, Miami, Florida, United States; [10]Brigham and Women's Hospital, Boston, Massachusetts, United States; [11]Tufts Medical Center, Boston, Massachusetts, United States

BACKGROUND There are few data on the contemporary trends in utilization of mechanical circulatory support (MCS) in patients who hospitalized after out-of-hospital cardiac arrest (OHCA).

METHODS We conducted an observational analysis of patients hospitalized after OHCA between January 2007 and December 2013 from the Nationwide Inpatient Sample database. The use of MCS was determined using ICD-9-CM, procedure codes. These included intra-aortic balloon pump (IABP) (ICD-9: 37.61), percutaneous ventricular assist device (PVAD) (ICD-9: 37.68), and extracorporeal membrane oxygenation (ECMO) (ICD-9: 39.65). We also compared trends of survival to hospital discharge in patients with and without MCS use.

RESULTS Of 968,083 OHCA, MCS was used in 49,565 (5.1%) of the patients. IABP was the most commonly used MCS after OHCA with frequency of 46,371 (4.8%), followed by ECMO 2,904 (0.3%), and PVAD 2,323 (0.2%). Overall trend of MCS increased by 33% from 4% in 2007 to 5.4% in 2013 (Ptrend<0.001). Trend of IABP used increased by 18.6% from 2007 to 2013 (4% to 4.7%, Ptrend<0.001), whereas PVAD utilization increased by 410% (<0.1% to 0.5%, Ptrend<0.001), and ECMO by 430% (0.1% to 0.5%, Ptrend<0.001). Overall survival to discharge was significantly higher in patients who were selected to have MCS (56.5% vs. 41.9%, p-value<0.001). Survival to discharge increased significantly in both groups (MCS group: 50.5% to 57.6%, Ptrend<0.001; No MCS group: 36% to 46.9%, Ptrend<0.001) over the study period (see figure).

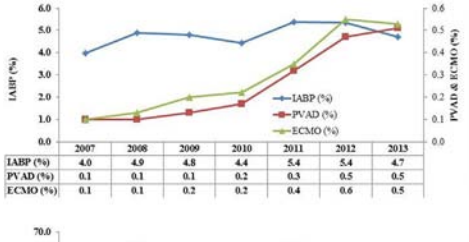


Figure 1 A. Contemporary trends of IABP, PVAD and ECMO in OHCA patients.

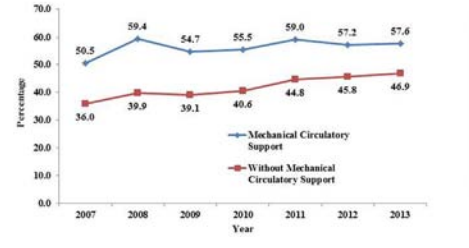


Figure 1 B. Trends of survival to discharge in OHCA patients with and without MCS use

CONCLUSION PVAD and ECMO utilization have increased significantly in comparison to IABP in patients with OHCA. OHCA patients who were selected to have MCS use had better survival to discharge. Randomized studies are required to validate our observations.

CATEGORIES CORONARY: Hemodynamic Support and Cardiogenic Shock

TCT-24

Global cVAD Registry: A global initiative in percutaneous circulatory support From the cVAD Steering Committee on behalf of all cVAD Investigators

Brijeshwar Maini,[1] Jeffrey Moses,[2] Simon Dixon,[3] Mark Anderson,[4] William Lombardi,[5] Jacob Eifer Møller,[6] Jose Henriques,[7] Andreas Schafer,[8] Theodore Schreiber,[9] E. Magnus Ohman,[10] William O'Neill[11]
[1]Tenet Florida, Delray Beach, Florida, United States; [2]NewYork-Presbyterian Hospital/Columbia University Medical Center, New York, New York, United States; [3]Beaumont Hospital, Royal Oak, Michigan, United States; [4]Albert Einstein Health Network; [5]University of Washington Medical Center, Seattle, Washington, United States; [6]Odense University Hopital, Odense, Denmark; [7]Academic Medical Center - University of Amsterdam, Amsterdam, Netherlands; [8]Sakakibara Heart Institure; [9]DMC, Warren, Michigan, United States; [10]Duke University Medical Center, Durham, North Carolina, United States; [11]Henry Ford Hospital, Detroit, Michigan, United States

BACKGROUND Percutaneous circulatory support has an exponential growth within the last decade. In the era of evidence based medicine and appropriate use, having a systematic, standardized conduit for clinical data in "real world" medical setting becomes paramount. Objective: To build a comprehensive depository data collection system that monitors current usage and provides quality metrics to improve patient outcomes.

METHODS The global cVAD registry is an ongoing, observational, multicenter registry that includes patients receiving the Impella devices in the daily, routine clinical care per institutional standards and treating physician's discretion. The registry is currently open in US, Canada, Europe and later in Japan. The registry collects standardized data on all patients supported with Impella devices (2.5, CP, 5.0/LD and RP) and all indications at the participating sites without preselection. Patient demographics, medical history, risk factors, procedural characteristics, hemodynamic parameters, angiographic and echocardiographic imaging data and outcomes up to 1 year are collected and entered into a one centralized electronic data capturing (EDC) system. Data is monitored against source documents for accuracy and the outcomes are adjudicated by an independent Clinical Event Committee.

RESULTS Since 2009, a total of 61 sites were included in the registry enrolling a total of 2903 patients. The distribution by reason for Impella use is presented below: Totality of the data including patient characteristics and outcomes will be presented at the meeting.

Reason for Impella Support	Number of patients N=2903
High Risk Percutaneous Coronary Intervention	1486 (51.2%)
Acute Myocardial Infarction complicated by cardiogenic shock	920 (31.6%)
Post Cardiotomy Cardiogenic Shock	87 (3%)
Other High Procedures (BAV, EP)	126 (4.3%)
Other Shock	168 (5.8%)
Other	106 (4%)

CONCLUSION Global cVAD registry is a unique endeavor in the field of percutaneous mechanical circulatory support spanning across all cardiology specialties. This vast repository of clinical data is likely to contribute to development of quality metrics and treatment algorithms to improve patient outcomes.

CATEGORIES CORONARY: Hemodynamic Support and Cardiogenic Shock