

PERIANESTHESIA MANAGEMENT OF HEART FAILURE

ssociate Professor and Chair, Dept of Clinical Science Medical University of South Carolina

AANA President elect



Review	Review the pathophysiology of systolic and diastolic heart failure
Discuss	Discuss the current literature on cardiac resynchronization therapy
Discuss	Discuss the surgical treatment of heart failure
Describe	Describe an evidence-based approach to perioperative management of the patient with heart failure

2

'Heart failure is a tremendous burden on society in terms of both lives lost and healthcare costs. Knowledge of both medical and surgical therapies aimed at improving ventricular efficiency and reversing ventricular remodeling should be in the armamentarium of clinicians treating heart failure patients.'

McGee, 2006

Heart Failure Readmission Rates CMS Quality Measure Most common principle hospital discharge conditions billed to Medicare with high readmission rates Stable readmission rates but 20% are readmitted within 30 days and 50% by 6 months (2017)) Hospital Readmissions Reduction Program (ACA program) Ongoing issues with this metric Nearly 50% of reporting hospitals lost \$\$ with

- readmissions 40% of all 30-day readmissions were potentially
- 40% of all 30-day readmissions were potentially preventable, HF was the primary preventable readmission (24%) Middleton, 2019



BACKGROUND OF HEART FAILURE

Epidemiology Risk Factors Pathophysiology



6





7

Clinical Assessment

- RV Failure (Congestion)
 - peripheral edema
 - anasarca
 - hepatomegaly (cardiac cirrhosis)
 - ascites
 - coagulopathy
 - hepatojugular reflux
- LV Failure (dec. forward flow)
 - pulmonary Congestion
 - dyspnea
 - orthopnea/ PND
 - poor peripheral
 - perfusion
 - dizziness, confusion, cool extremities
 - fatigue





















NYHA Functional Classification

- Stages of Heart Failure
 - Stage I
 - No symptoms
 - Stage II
 - Mild symptoms
 - Stage III
 - Marked limitation in activity
 - Stage IV
 - Severe limitations even at rest





20

















Preoperative Considerations

- Is it <u>well</u> compensated?
 What is the NYHA or the
 - ACC/AHA classification? - Do you have a recent BNP or serial BNPs?
 - Is there resting tachycardia or narrowed pulse pressure
 - (<25)? Does the patient have an implanted device?

Is the patient in sinus rhythm?



30









MANAGEMENT OF HEART FAILURE

Barostim Procedure Cardiac Resynchronization Therapy Surgical Procedures Treatment strategies that result in the reversal of pathologic remodeling have reduced heart failure mortality

Eapen and Rogers, 2009

RAS Antagonists ACEI and ARB

Medical Management

- Direct renin antagonists
- Beta-adrenergic blockers
- Aldosterone antagonists
- Calcium sensitizing agentsEndothelian blocker
- Atrial Natriuretic Peptide analogs (Urodilatin)

Intervention has shifted from management of symptoms (diuresis) to decreasing the impact of neurohormones (norepi, ATII, and aldosterone)

General goals

- Correct the underlying problem
- Treat rhythm abnormalities
- Restore normal synchrony
- Optimize preload
- Reduce afterload
- Improve cardiac contractility



38





39

CRT

- BiVentricular Pacing
 RV and LV
- Univentricular pacing with lead placed at area of delayed conduction

coronary sinus

 TriPacing
 Additional lead placed via the

41





42





44





46



Barostim Neo System

- Approved by the FDA in 2019
- Entire system remains subcutaneous
- Electrode end is sutured to outside of carotid sinus
- Stimulates close to 40x more frequently than traditional pacemaker
- Wireless programing and interrogation sessions





Surgical approaches

- Goal: improve perfusion and function by reshaping the LV
- CABG +/- MVR
 - Revascularization of stunned but viable myocardium
 - Isolated MR: no improvement in mortality
- STITCH trial
- Transmyocardial laser
- Gene therapy with angiogenesis

52





54

Paracormedical.com



References

Ahuja, K, Crooke, GA., Groosie, EA., Galloway, AC., & Jorde, UP (2007). Reversing Left Ventricular Remodeling in Chronic Heart Failure Surgical Approaches. Cardiology in Review, 15, 184-190.

Allen, JA & Felker, GM. (2008). Advances in the Surgical Treatment of Heart Failure. Current Opinion in Cardiology, 23, 249-253.

Carrel T., Englberger L., Martinelli, MV., Takala,J., Boesh, C., Sigurdadottir, V., Gygax, E., kadner, A & Mohacsi, P. (2012). Continous flow left ventricularasssit devices: a valid option for heart failure patients. Swiss Medical Weekly, 142, 1-11.

Colonna, P & Antonelli, G. (2011). In search of the best prognostic factor in patients with congestive heart failure: the paradox of ejection fraction without prognostic significance. Italian Federation of Cardiology, 12, 314-317.

ASA Task Force (2011) Practice Advisory for the Perioperative Management of Patients with Cardiac Implantable Electronic Devices: Pacemakers and Implantable Cardioverter-Defibrillators. Anesthesia and Analgesia, 114, 247-261.

Gelzinis, TA & Subramaniam, K (2012). Systolic Heart Failure and Anesthetic Considerations. International Anesthesia Clinics, 50(3), 146-170

56

References

Groban, L & Butterworth, J. (2006). Perioperative Management of Chronic Heart Failure. Anesthesia and Analgesia, 103(3), 557-575.

Ho, JK. & Mahajan, A. (2010). Cardiac Resynchronization Therapy for Treatment of Heart Failure. Anesthesia and Analgesia, 111(6), 1353-1361.

Kerwin, WF & Paz, O. (2003). Cardiac Resynchronization Therapy: Overcoming ventricular dyssynchrony in dilated heart failure. Cardiology in Review, 11(4), 221-239.

Turer, AT & Rao, SV. (2005). Device Therapy in the Management of Congestive Heart Failure. Cardiology in Review, 13(3), 130-137.

Vegas, A. (2008). Assisting the Failing Heart. Anesthesiology Clinics, 26, 539-564

57