Contemporary Management of Cardiogenic Shock: Drugs and Devices

Disclosures: None

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Approach to Cardiogenic Shock

Patient with clinical evidence of cardiogenic shock

- H&P, electrocardiogram, echocardiogram, coronary angiography when indicated

Hemodynamic instability

- PAC, inotropes +/- vasodilators

Persistent hypotension, elevated cardiac filling pressures, low cardiac index, urine output < 30 cc/hr, MCS candidate

- IABP or percutaneous VAD

Continue Support

- Adequate response with anticipated short term recovery
- Inadequate support with anticipated recovery or need for concomitant respiratory support

Inadequate response, unlikely to recover

- Transplant candidate?

  - Yes
    - List for transplant, Implantable BTT LVAD, BiVAD or TAH
  - No
    - DT LVAD

Paracorporeal VAD or ECMO
Cardiogenic Shock: What is Working Well?

- There are 52,000 members of the ACC with 53,147 solidly formed opinions on the best approach to treat cardiogenic shock.
- There are many devices and drugs from which to choose.
- Cardiac critical care units and teams have evolved from managing acute ischemic heart disease to caring for critically ill patients in shock.
- In some centers, the “Heart Team” approach has brought together expertise from multiple disciplines to enhance and speed decision making.
- We have reasonable longer-term solutions for the shock patient including high risk percutaneous and surgical interventions, transplant, durable MCS.
“For my handling of the situation at Tombstone, I have no regrets. Were it to be done again, I would do it exactly as I did it at the time.” —Wyatt Earp, lawman
Critical Practice and Knowledge Deficits

- Is the pathobiology of all cardiogenic shock the same?
  - Our understanding is primarily hemodynamic

- Do practitioners recognize cardiogenic shock?
  - Yes, often in the setting of an acute event
  - No, particularly in patients with chronic heart failure. There is rarely an assessment of the hemodynamic status

- The community has not organized in a manner to most efficiently manage cardiogenic shock

- Some patients have shock resiliency

- The role for drugs with positive inotropic properties is very unclear but largely untested in this patient cohort
  - Clinical trials would require clear definition of patient characteristics
Critical Practice and Knowledge Deficits

- Is there a role for matching a patient more closely to a drug/device?
  - Severity of LV dysfunction
  - Biventricular heart failure
  - Co-morbidities

- The changing healthcare environment in the US will disincentivize complex, expensive care.
  - There is a need to balance evidence-based approaches with developing an evidence base
  - The clinical community would benefit from validated risk prediction models to guide decision-making
  - We need to leverage the EHR to collect real-world evidence and perform pragmatic clinical trials
Priorities

- **Short Term**
  - Characterize shock patients more thoroughly (split rather than lump)
  - Develop:
    - standardized definitions, data collection, and relevant endpoints
    - national and international registries
    - research consortia that can execute clinical trials efficiently
  - Develop and implement an educational campaign to re-teach clinical approaches to shock
  - Use the RACE program as a model to expedite care for shock patients

- **Long Term**
  - Develop comparative effectiveness trials with well-characterized patients
  - Begin trials to understand adjunctive therapies for shock that go beyond hemodynamic support
  - Initiate a Centers of Excellence concept for cardiogenic shock that acknowledges a team-based approach to care, process measures, and outcomes