Order after Chaos: Who are the Appropriate Candidates for ICD’s and CRT

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Disclosures

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The Challenge

How to make a guideline talk interesting...?!

Guidelines for device therapy have changed over the years...

How do you keep this all straight?
"No, a defibrillator doesn’t make someone tell the truth."
The Past

• 1980’s
  – Open heart procedure
  – Needed to survive 2 cardiac arrests
  – Devices came preprogrammed from factory; unable to program and no pacing ability

• 1990’s
  – Abdominal then pectoral transvenous implantation
  – Needed to survive 1 cardiac arrest
  – Primary prevention trials; MUSTT, MADIT, SCD-HeFT, etc.
  – Advancement in ICD technology; chips and batteries
Past and Present
The Past

• Late 1990’s-2000’s
  – Development of CRT in patient’s with CHF/LBBB
Dynamic Cardiomyoplasty for CHF
Biventricular ICD
This Presentation is About My Attempts at Turning Chaos into Order
CHAOS = Guidelines

- Guidelines including CMS (Center for Medicare & Medicaid Services) and AHA/ACC/HRS don’t necessarily address the same issues

- Multiple iterations over the years
Indications*
(all in conjunction with optimal medical therapy)

• Class I Indications:
  – Primary Prevention in Ischemic CMP
    • At least 40 days out of an MI
    • EF ≤35% if FC II-III or ≤30% if FC I
    • If NSVT present, EF ≤40%, refer for EP study. ICD if inducible VT or VF, falls into secondary prevention
  – Primary Prevention in Non-ischemic CMP
    • EF ≤35%, FC II-III
    • With new onset CHF, at least 90 days of optimal medical therapy

*2012 ACC/AHA/HRS Guidelines
Indications

• Class I Indications (cont.)
  – Secondary Prevention
    • Cardiac arrest with no reversible cause
    • Sustained VT with structural heart disease
    • Unexplained syncope with inducible VT/VF at EP study.
Indications

• Class IIa; ICD is *reasonable*
  – Heritable diseases with risks for SCD or dangerous symptoms (long QT, CPVT, ARVD, Brugada, etc.)
  – Sustained VT even with normal LV function
  – Non-hospitalized patients awaiting transplantation
Indications for CRT

• Class I Indications
  – LVEF ≤35%
  – FC II, III or ambulatory Class IV
  – Wide complex QRS; LBBB, QRS duration ≥150 msec
  – Sinus rhythm
Indications for CRT

- **Class IIa Indications:** CRT can be useful
  - LVEF \( \leq 35\% \)
  - LBBB with QRS 120-149 msec
  - FC II, III or ambulatory Class IV
  - LVEF \( \leq 35\% \)
  - Non-LBBB with QRS \( \geq 150 \text{ msec} \)
  - Class III or ambulatory Class IV
Indications for CRT

• Class IIa Indications: CRT can be useful
  – LVEF ≤35%
  – AF and near 100% pacing requirement (AV node ablation)
  – LVEF ≤35%
  – Need for >40% pacing
Indications

2014 HRS/ACC/AHA Expert Consensus Statement on the Use of ICD Therapy in Patients Who are Not Included or Not Well Represented in Clinical Trials

Circulation.2014;130:94-125
Special Circumstances

• 18 clinical scenarios addressing circumstances where ICD therapy seems warranted but don’t fall into guideline criteria
• Addresses need for dual or single chamber devices
• A good resource but too detailed for this talk
ORDER = Take Home Points
• Take Home Points: Refer for an ICD…
  – All patients should be on GDMT (guideline directed medical therapy)
  – Remember EF of ≤ 35% and FC II-III for all pts.
    • EF 30% if FC I
  – All should be >40 days post MI
  – CMS: With new heart failure or revascularization, ≥ 90 days of medical therapy then reassessment of EF
ORDER

• Take Home Points (cont.)
  – If they’ve had a cardiac arrest (sustained VT/VF), they need an ICD (secondary prevention)

  – High risk genetic disorders (long QT, HCM, CPVT, Brugada, etc.) may need an ICD

  – If the EKG shows a wide complex QRS or if chronic pacing anticipated, refer for CRT
Cases
Case Presentation 1

- 56 year old man presents with subacute MI
  - Chest tightness started 2 days ago, but denied it was his heart. Symptoms continued, urged by his wife to go to ER
  - No prior cardiac history, on no meds; smoker, positive family history
  - ST segment elevation and q waves seen anteriorly and apically
Case Presentation 1
Case Presentation 1
Case Presentation 1

• Urgent PCI/stenting of the LAD
• His LVEF was calculated at ~30% with anterior/apical akinesis
• He’s placed on optimal medical therapy with beta blockers, statin, ACE-I, antiplatelet agents
• The night of the PCI he develops an asymptomatic arrhythmia lasting over a minute…
Case Presentation 1
Case Presentation 1

• What’s the next step?

• Is he a candidate for an ICD?
Case Presentation 1

- Reperfusion idioventricular rhythm; don’t treat, doesn’t alter prognosis

- Needs 90 day wait on meds then reassessment of LVEF to determine whether ICD is indicated
Case Presentation 2

• 72 year old man, remote MI 8 years ago;
  – Progressive dyspnea on exertion over the last 3 months.
    • Used to be able to climb one flight of stairs with only mild dyspnea
    • Now has to stop in the middle of the stairway to catch his breath
    • No CP, palpitations or lightheadedness.
Case Presentation 2

- Cardiac medications:
  - Ramipril 10 mg BID
  - Furosemide 40 mg BID
  - Spironolactone 25 mg daily
  - Carvedilol 18.75 mg BID
  - Plavix 75 mg daily
Case Presentation 2

- Exam
  - BP 95/55  HR 75/min
  - Skin warm and dry
  - JVP mildly elevated at 45°
  - Lungs clear bilaterally
  - Cardiac impulse laterally displaced and diffuse
  - Reverse split S2 with grade II/VI holosystolic murmur
Case Presentation 2
Case Presentation 2

- Echo shows EF of ~30% with anteroapical akinesia and evidence for dyssynchrony.
- Regadenoson Nuclear stress test with anteroapical scar with minimal peri-infarct ischemia, EF 26%.
- Holter with SR, HR range 52-115 bpm occasional ventricular ectopy, no symptoms reported
Case Presentation 2

• How can you help him?
• Would you refer for an ICD?
• Would you consider anything else?
Case Presentation 2

• Pt. meets criteria for CRT-D, (for a primary prevention ICD with CRT) because of his Functional Class, LVEF, use of GDMT and LBBB
Thank You!