Pacemaker endocarditis

Karchmer, Adolf. “Infection of implanted pacemakers.” UpToDate v11.3.

Key Points:
- Like prosthetic valves, there is early and late pacemaker infection
- Infection severity varies by location: pocket vs. electrode
- Electrode endocarditis often requires surgical removal and carries high morbidity and mortality, but treatment has not been evaluated in prospective randomized fashion

Epidemiology
- Incidence: 0.8-5.7%
- Risk factors: diabetes, malignancy, advanced age, prior treatment with anticoagulants or steroids, operator inexperience, or use of temporary pacemaker, recent surgery involving device (manipulations or battery exchange)
- Mechanisms
  - Skin contamination at time of surgery (coagulase-negative staphylococci)
  - Erosion of component through skin
  - Spread from pocket to leads (less likely)
  - Bacteremia and seeding (endothelial covering is protective and starts within 1 week)

Presentations
- Pocket infection: localized changes +/- systemic symptoms
- Epicardial electrodes: constitutional symptoms, pericarditis, mediastinitis
- Transvenous leads: like right sided endocarditis
  - 1/3 are within 3 months and may have concurrent pocket infection
  - 2/3 are >3 months (average 25 months) with constitutional symptoms, pulmonary embolic disease, tricuspid regurgitation

Diagnosis
- Echocardiography: TEE 91-96% sensitive vs. TTE 22-43% sensitive
- Modified Duke’s criteria: sensitive

Treatment
- For deeper infections, removal of entire system with systemic antibiotics
- Extraction of electrodes: difficult >18 months with surgical morbidity / mortality
  - Not associated with PE on removal when large vegetations
  - Data not based on randomized trials
- Delay before replacing permanent pacer

Del Rio et al
- Prospective study of infection of pacemakers and ICDs
- Incidence: approximately 0.6% of pacers/ICDs, 4.6% of all infective endocarditis
- 7 patients had medical treatment without surgical removal – all relapsed, and 1 died
- 24 patients had surgical removal: 1 relapsed, 3 died after surgery, others without relapse for mean 38+/-.9 months
- Not randomized to treatment: variables associated with removal included larger vegetations and shorter time from implantation to diagnosis