• Disclosure

• This is not my case but I helped in part of this story and I took permission from other operators.
• 35 years male patient

• H/O of PPM implantation (DDD) 15 years ago in left infraclavicular region (No documentation)

• He gave history that he has battery replacement 5 years ago.

Later on he complained of dizziness and palpitations.

He was told that there is a problem in atrial lead sensing.
• A decision was taken by his physician to:

• 1- remove battery on left side and keep old leads.

• 2- implant a new DDD PM in right infraclavicular region

• After 7 months the skin over new PM was red then PM became exposed to air as a complication of infected pocket
• A physician debrid e infected pocket and close it

• Then make a tunnel for the same pacemaker leads and put the same battery in a new pocket below and lateral to old pocket in right axillary area
• WOW
• LOOK what happened after using same PM battery and leads from previously infected pocket

Site of third pocket

• 3 MONTHS AFTER DEBRIDMENT

What can I do??

The patient asks what is the solution?
• Patient was advised to do Surgery for epicardial PM lead after removing right side PM

• BUT he refused

What can you do:

1- give antibiotics, close the pocket

2- give antibiotics, remove right side PM, put a TPM and implant new one on right side after eradication of infection

3- give antibiotics, remove right side PM, put a TPM and implant new one on left side after eradication of infection

4- give antibiotics, remove PM and all leads on both sides. put a TPM and implant on left side after eradication of infection
OPERATING TEAM CHOOSE THIS

4- give antibiotics, remove PM and all leads on both sides. put a TPM and implant on left side after eradication of infection
### Non--infected ICED extraction

<table>
<thead>
<tr>
<th>Type</th>
<th>Indication</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td></td>
<td>Class I</td>
</tr>
<tr>
<td>Non-functional leads</td>
<td></td>
<td>Class IIa</td>
</tr>
<tr>
<td>Functional leads</td>
<td></td>
<td>Class IIb</td>
</tr>
<tr>
<td>Chronic pain</td>
<td></td>
<td>Class IIa</td>
</tr>
<tr>
<td>Thrombosis/ obstruction</td>
<td></td>
<td>Class IIa</td>
</tr>
<tr>
<td><strong>Non functional LEAD</strong></td>
<td>Implant would require &gt; 4 leads on one side or &gt;5 leads through SVC</td>
<td>IIa</td>
</tr>
</tbody>
</table>

**Plan:**

1. CBC, wound culture
2. Start vancomycin IV
3. remove infected PM on right side (all system)
4. put TPM
5. continue vancomycin for 1 week
6. open left side pocket and extract old leads, put the new PM in same side

*Swear that you will never tell any one*
'Which is which?'

Loose suture to permit wound healing with secondary intention

2 incisions were done so we can remove battery, clear the way for PM leads and cut sutures near subclavian access
- patient received vancomycin IV for 10 days

- Waiting blood culturs
Proximal end of atrial lead was damaged. It seems that there was a previous trial of extraction.

Trying to remove the lead with gentle traction.

Note that dye passes away from leads. Fibrosis.
We prepared all required tools.
What a happy moment

Thanks god everything is removed

• 2ND DAY ECHO

• Normal right side chambers dimensions and systolic function. Mild TR. Estimated PASP is 12 mmHg + RAP.
• Next day after extraction

• 1- Patient developed fever 38 c.
  • He gave history of one or two spikes of fever the week before admission ??????

• 2- N.B. patient was still on vacomycin IV during hospital course

What is the cause of fever:

1- URI or LRI (Nosocomial infection)

2- UTI

3- IE on TV

4- Sepsis

5- I will search for all
OPERATING TEAM

Expected the worst scenario

IE

But at the same time they started working up for

DD of fever
### Urine Analysis & C/S

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ref. Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Yellow</td>
</tr>
<tr>
<td>Aspect</td>
<td>Clear</td>
</tr>
<tr>
<td>pH</td>
<td>5</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Absent</td>
</tr>
<tr>
<td>Chemical Examination</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>Absent</td>
</tr>
<tr>
<td>Ketone Bodies</td>
<td>Absent</td>
</tr>
<tr>
<td>Bile Pigment</td>
<td>Absent</td>
</tr>
<tr>
<td>Urobilinogen</td>
<td>N. Trace</td>
</tr>
<tr>
<td>Albumin</td>
<td>Absent</td>
</tr>
<tr>
<td>Microscopic Examination</td>
<td></td>
</tr>
<tr>
<td>Pus cells/ HPF</td>
<td>0-10</td>
</tr>
<tr>
<td>R.B.Cs/HPF</td>
<td>Rare</td>
</tr>
<tr>
<td>Epithelial cells</td>
<td>Absent</td>
</tr>
<tr>
<td>Crystals</td>
<td>Absent</td>
</tr>
<tr>
<td>Amorphous materials</td>
<td>Absent</td>
</tr>
<tr>
<td>Casts</td>
<td>Absent</td>
</tr>
<tr>
<td>Parasites</td>
<td>Absent</td>
</tr>
<tr>
<td>Yeast cells</td>
<td>Absent</td>
</tr>
<tr>
<td>Others</td>
<td>No growth</td>
</tr>
</tbody>
</table>

**Comments:** Culture for fungi revealed growth of *Candida* spp. 3600 CFU/mL.

**Total Leucocytic Count:** 12,600 / 4,000 - 11,000
**WOW!**

**4th Day Echo**

- Wound and tip of PM lead culture which was taken before vancomycin?

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**2015 ESC Guidelines**

**A. Diagnosis**

1. Three or more sets of blood cultures are recommended before prompt initiation of antimicrobial therapy for CIED infection.
2. Lead-tip culture is indicated when the CIED is explanted.

**Comments:** Possible contamination as the sample was delivered to the lab in a solution of doubtful sterility.

**Growth of Anthracoid**
• 2 blood cultures were done
• Before starting vancomycin

Blood Culture (BACTEC).

No growth

Comments:
- Kindly recommended to examine two other samples to confirm bacteraemia.

• TPM was removed as a part Fever treatment ? IE ?

• Rhythm after TPM removal
What is the Rhythm?

1- Normal sinus rhythm
2- Atrial flutter
3- Atrial tachycardia
4- Accelerated junctional rhythm
5- lower atrial focus

Rhythm after TPM removal
• Culture of TPM tip ?

Growth of Anthracoid

Possible contamination as the sample was delivered to the lab in a solution of doubtful sterility.
What is anthracoid infection? Do you mean anthrax?

1- it is virus infection
2- it is bacterial infection
3- I am hungry, I can not think now
4- I hate this case, it is very complicated.
• Anthracoids are self limited non virulent bacteria called Psuedoanthrax.

• Anthrax is lethal infection specially if it is through inhalation
  • First choice antibiotics: Ciprofloxacin.
  • Alternative drugs: Penicillin, Erythromycin, Doxycyclines
• IE cardiologist advised to:
  • Treat as BCNIE
  • Take more cultures

• **Vancomycin spectrum**
  • MRSA
  • MSSA
  • Certain β-lactam- and multidrug-resistant *Streptococcus pneumoniae*
  • β-Hemolytic streptococci
  • *Corynebacterium* group JK
  • Viridans streptococci
  • Many strains of enterococci

• **Operators added**
  • **Doxycycline** 100 mg/12 h
  • **Levofloxacin 500 mg Po BID**

• **In case of BCNIE**

2015 ESC Guidelines
*Doxycycline (brucella, C. Burnetii, Bartonella)*
*Levofloxacin (legionella, Mycoplasma, T whiplii)*
• 2 more blood cultures were done

• Fever became low grade arround 37.5

• BUT patient was feverish ? ? ??
CRP was done to follow up degree of inflammation

CRP decrease over 15 days

What can I do??

What about reviewing our procedure and its complications??

Operator
UL Thrombophlebitis and patient did not complain of UL swelling or anything except fever
The missed part of the story

Do you remember this
• Anticoagulation started (rivaroxaban)
  Brufen ( NSAID )
• Paracetamol
• Hold doxycycline and levofloxacin
• Fever disappeared
• Patient asks for discharge so
  vancomycine is changed to linozolid
  600 mg PO BID for 10 days

• Surgery was planned for repairing TR
  and putting epicardial PM lead
• After 2 days patient call C/O
• Skin rash and allergy after using linozolid

Table 3: Recommendations on minimum training and volume for lead extractor operators and centres

<table>
<thead>
<tr>
<th>Lead extraction status</th>
<th>Minimum number of leads</th>
<th>Minimum number of procedures</th>
<th>Additional requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainee</td>
<td>40 leads under supervision: 10 ICD leads, 10 leads &gt; 6 years old</td>
<td>30</td>
<td>Full qualification in CIED implantation</td>
</tr>
<tr>
<td>Primary operator (trained)</td>
<td>20/year</td>
<td>15/year</td>
<td></td>
</tr>
<tr>
<td>Supervisor trainer</td>
<td>75 total</td>
<td>30/year</td>
<td></td>
</tr>
</tbody>
</table>
2. **TAKE HOME MESSAGE**

Coast benefit of lead extraction

- Extract
  - Acute procedural risks
  - Future Benefits
- Abandon
  - Acute procedural benefits
  - Future risks

3. **TAKE HOME MESSAGE**

Prevention is better than treatment

- NEW ERA

**Antibacterial envelope**
أي تشابه بين أحداث القصة وبين الواقع هو من وحي خيال المؤلف.*