Options for management of infected arthroplasty

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Prevention

- **Choose well/** cut well/** get well
- Preparation
- Ultra clean air theatres
- Body exhaust suits
- Antibiotics
MRC trial

- Antibiotic-loaded cement 11
- Systemic antibiotics 4.8
- Ultra-clean air 2.6
- Body exhaust suits 2.2
Air flow

- Laminar flow
  - Reduction of deep infection from 7% to 0.5% (Charnley, J. Postoperative infection after THR with special reference to air contamination in the operative room. Clin Orthop Relat Res 1972; 87:167-87)

- Howarth ex-flow
  - Inverted trumpet
  - No entrainment
Accept infection is inevitable
Diagnosis

- History
  - Never quite right
  - Prolonged hospital stay
  - Mechanical pain
  - Wound problems
  - Time of onset (implantation vs. haematogenous spread)
Diagnosis

- Examination
  - Sinus
  - Pus
  - Discolouration
  - Pain on movement
  - Normal
Diagnosis

- Investigations
  - Blood tests
  - Imaging
  - Aspiration
  - Frozen section
  - Polymerase chain reaction
Blood tests

- ESR (more use when normal than raised)
  - Sens 0.82  Spec 0.85  PPV 0.58  NPV 0.95
- CRP (should be normal after 3 weeks)
  - Sens 0.96  Spec 0.92  PPV 0.74  NPV 0.99
- WCC (usually only raised with sepsis)
- Longstanding infection may lead to anaemia and raised platelets
Radiology

- Plain X-rays- usually normal, may show osteolysis/scallop/periosteal reaction.
- Radio-isotope scan
  - Technetium-99m scanning: increased uptake up to 18mths post op, false negatives from infection interrupting blood supply
  - Labelled white cell scans: expensive
Aspiration/ Biopsy

- Only possibility to determine the micro-organism preoperatively
- More useful when implant in-situ for less than 5 years (Barrack and Harris)
- Stop antibiotics for 2 weeks before
- Spec between 87-97%
- Sens between 80-92%
Frozen Section

- Requires Pathologist
- Ten polymorphs per high powered field
- Sens 84%
- Spec 99%
- Athanasou NA et al Diagnosis of infection by frozen section during revision arthroplasty JBJS Br 1995; 77(1):28-33
Options
Surgical Debridement

- Debridement and washout
- Aim to preserve implant
- In first 3 weeks success 84%
- Between 3-6 weeks 54%
- For late presentation <50%
- Generally safe
- Low risk/ possible high gain
Surgical Exchange

- Two stage
  - **Explant ALL of infected joint**
  - multiple tissue samples
  - Antibiotic spacer
  - Six week course of antibiotics
  - Success rate 90%
  - Monitor response with ESR/CRP
  - Re-implant when clear of infection
Surgical Exchange

- One stage
  - Improved efficiency
  - Reduced morbidity
  - Easier surgically
  - Some centres report 80% success rate
Other options

- Amputation
- Fusion
- Girdlestone
- Antibiotic suppression
Conclusions

- Multidisciplinary team works
- A microbiologist with a special interest highly desirable
- Tailor antibiotics
- Proper surgical debridement
- Patience for patient and surgeon
“If many remedies are suggested for a disease, that means the disease is incurable”

Anton Chekhov (The Cherry Orchard)
Questions?