BRITISH HIP SOCIETY

BHS SURGICAL STANDARD

Investigation & Management of Peri-prosthetic Joint Infection (PJI)

Inclusion

All patients with a hip arthroplasty (hemi, total, resurfacing or revision) presenting with suspected PJI.

Organisation

A well-defined pathway should be in place, co-ordinated by an MDT, for the investigation and management of patients with suspected or confirmed PJI. Every unit managing PJI must submit data to national databases (NJR, BAJIR) to monitor performance against national standards.

1. Acute PJI (see 9-10 below) should be managed by a hip arthroplasty specialist supported by access to appropriate MDT advice.
2. Chronic PJI should be managed in a unit where the following are in place:
    a. Appropriate expertise and experience in PJI management
    b. An MDT with specialised microbiology and/or infectious disease input as described below (see 3)
    c. 'Protected' inpatient beds with screening in place for MSSA/MRSA/COVID-19
    d. Access to appropriate critical care provision

MDT structure

3. The MDT should comprise specialist hip arthroplasty surgeons, infectious disease physicians or microbiologists, specialist nurses, an MDT co-ordinator and administrative support reflected in job plans. Meetings should occur Face to Face or Virtually at least once a fortnight and operate under clear 'Terms of Reference' with documented agenda and output.
4. The MDT should have access to pharmacists, plastic & vascular surgeons, MSK radiologists and rehabilitation teams, either locally or via a regional network.
5. Patients should have access to advice and early review through a single contact number during treatment for PJI.
6. All involved health care professionals should undergo continued medical education.
7. Discussions should be standardised, recorded and outcomes audited e.g., BAJIR (https://bajir.org).

Clinical Presentation

8. PJI can have acute and chronic presentations. All T&O surgeons should be able to investigate suspected PJI and inform the MDT early.
9. PJI presenting with systemic sepsis demands urgent joint washout. NHSE 'Sepsis Six' protocol should be instigated. Appropriate parenteral antibiotics will be required, after sampling if safe to wait.
10. Acute PJI with symptoms of less than 4 weeks warrants consideration of Debridement Antibiotics and Implant Retention (DAIR).
11. Chronic PJI should be suspected in early failure of THR. Suspected chronic PJI requires urgent outpatient review and investigation. Confirmed PJI requires discussion at the MDT.

Diagnosis

12. Diagnosis should be made using standardised criteria (EBJIS 2020)[1].
13. Serological Analysis should include CRP +/- ESR or PV.
14. Aspiration ± biopsy should be undertaken in a clean operating theatre or radiology suite using aseptic technique, sterile pots and/or blood culture bottles. Consider saline irrigation in the event of a 'dry tap'. Consider Synovial fluid leucocyte count, leucocyte esterase, neutrophil differential and alpha-defensin. Samples should undergo extended cultures with incubation for at least 7 days.
15. Antibiotics should not be administered for 2 weeks prior to sampling except for a systemically unwell patient.
16. X-Rays are required in all cases. A bone scan is rarely useful in PJI diagnosis. CT and MRI might assist evaluation.
17. At surgery, five separate specimens should be taken with clean instruments for each sample. Samples require urgent microbiological processing with extended culture as above. Histology can help with quantitative assessment of neutrophil infiltrates.
18. Culture negative samples suspicious for PJI warrant MDT discussion to consider fungal or mycobacterial cultures, appropriate serology and/or molecular testing. Repeat samples should be taken before excluding infection.

Treatment A: DAIR

19. DAIR should be performed urgently by an experienced hip arthroplasty surgeon, achieving a thorough debridement. Modular implants must be exchanged.
20. DAIR may be indicated for acute infections in a well-fixed implant.
21. DAIR is contra-indicated in the presence of a sinus, loose implant and infections due to fungal, multi-drug resistant or atypical organisms.
22. Caution is recommended in immunocompromised patients or those with multiple comorbidities.
23. Should only be repeated following discussion in the MDT as this is rarely successful at achieving eradication.

Treatment B: Revision for PJI

24. Single or two-stage exchange arthroplasty should be discussed at the MDT. Clinical, microbiological and reconstructive factors should guide decision-making.
25. Single stage revision for infection is most appropriate when pre-operative culture shows a single, antibiotic sensitive organism and where the soft tissue envelope is suitable.

[1] https://online.boneandjoint.org.uk/doi/full/10.1302/0301-620X.103B1.BJJ-2020- 1381.R1

26. Two-stage revision is recommended in cases of multi-drug resistant infection, multiple previous surgery, fungal or atypical microbiology or when there are negative pre- operative cultures.
27. Excision arthroplasty offers good infection control but poor function. It should be reserved for cases where reconstruction is not realistic.
28. Explanted devices should be sent to a recognised retrieval centre for analysis when a concern regarding implant performance exists or if the implant is a new design (i.e. included in Beyond Compliance).

Non-operative management

29. Patients unsuitable for surgery may be candidates for long-term antibiotic suppression after discussion by the MDT.
30. Antibiotic choice and treatment duration should be determined by the MDT, guided by local, regional and host factors.
31. Arrangements for appropriate wound care should be made.
32. An alteration in pain or discharge should alert to a change in microbial sensitivity, implant loosening, bone loss or dislocation.
33. Monitoring of appropriate blood tests (as guided by the MDT) with patients on long-term antibiotics should be undertaken.