



Supplement of

One- versus two-stage septic hip and knee revision surgery: a comparative cohort outcome study with short- to mid-term follow-up

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| Knee patients | | | | Hip patients | | | |
|---------------|---------------------|---------------|--------------------|--------------|--------------------|---------------|--------------------|
| One stage | Micro-organism | Antibiotic | Rifampin | One stage | Micro-organism | Antibiotic | Rifampin |
| 1 | Staphylococcus spp | Ciprofloxacin | Yes | 1 | S. epidermidis | Ciprofloxacin | Yes |
| 2 | S.warneri | Teicoplanin | No, due to allergy | 2 | S. haemolyticus | Teicoplanin | No, due to allergy |
| | Staphylococcus spp. | | | | | | |
| 3 | S. epidermidis | Ciprofloxacin | Yes | 3 | S. caprae | Clindamycin | Yes |
| 4 | S. epidermidis, | Clindamycin | Yes | 4 | S. milleri | Ciprofloxacin | Yes |
| | S capitis, | | | | C. acnes | | |
| | C. acnes | | | | | | |
| 5 | S. epidermidis | Ciprofloxacin | Yes | 5 | S. epidermidis | Ciprofloxacin | Yes |
| 6 | S. epidermidis | Ciprofloxacin | Yes | 6 | S. aureus | Ciprofloxacin | Yes |
| | C. acnes | | | | | | |
| 7 | S. epidermidis, | Clindamycin | No, due to allergy | 7 | C. acnes | Clindamycin | No |
| | C. acnes | | | | | | |
| 8 | S. epidermidis, | Clindamycin | Yes | 8 | S. caprae | Ciprofloxacin | Yes |
| | C. acnes | | | | | | |
| 9 | Streptococcus spp. | Clindamycin | Yes | 9 | S. capitis | Ciprofloxacin | Yes |
| 10 | S. epidermidis | Clindamycin | Yes | 10 | S. capitis | Ciprofloxacin | Yes |
| 11 | C. acnes | Clindamycin | No | 11 | S. aureus | Ciprofloxacin | Yes |
| 12 | S. caprae | Ciprofloxacin | Yes | 12 | Streptococcus spp | Clindamycin | No |
| Two stage | | | | 13 | S. caprae | Ciprofloxacin | Yes |
| 1 | C. acnes | Clindamycin | No | 14 | C. acnes | Clindamycin | No |
| 2 | S. milleri | Amoxicillin | No | 15 | S. aureus | Clindamycin | Yes |
| 3 | S. capitis | Ciprofloxacin | Yes | 16 | Streptococcus spp. | Linezolid | No |
| | C. acnes | | | | | | |
| 4 | S. epidermidis | Ciprofloxacin | Yes | 17 | E. coli | Amoxicillin | No |
| 5 | S. epidermidis | Ciprofloxacin | Yes | 18 | S. epidermidis | Ciprofloxacin | Yes |
| 6 | Streptococcus spp. | Amoxicillin | No | 19 | S. vestibularis | Clindamycin | No |
| 7 | Granulicatella | Clindamycin | No | 20 | S. epidermidis | Clindamycin | Yes |
| | adiacens | | | | | | |
| 8 | S. caprae | Ciprofloxacin | Yes | Two stage | | | |
| 9 | Corynebacterium spp | Linezolid | No | 1 | C. acnes | Amoxicillin | No |
| 10 | C. acnes | Clindamycin | No | 2 | S. epidermidis | Ciprofloxacin | Yes |

Table S1. Causative micro-organism and antimicrobial regiment for all patients (n=64).

| 1 | 1 | S. aureus | Clindamycin | Yes | 3 | S. aureus | Clindamycin | Yes |
|---|---|-----------|-------------|-----|----|---------------------|---------------|-----|
| 1 | 2 | C. acnes | Clindamycin | No | 4 | S. aureus | Clindamycin | Yes |
| | | | | | 5 | S. aureus | Ciprofloxacin | Yes |
| | | | | | 6 | S. aureus | Clindamycin | Yes |
| | | | | | 7 | S. aureus | Ciprofloxacin | Yes |
| | | | | | 8 | S. epidermidis | Ciprofloxacin | Yes |
| | | | | | | Enterobacter | Teicoplanin | |
| | | | | | | aerogenes | | |
| | | | | | 9 | C. acnes | Ciprofloxacin | Yes |
| | | | | | | S. epidermidis | Vancomycin | |
| | | | | | 10 | S. capitis | Ciprofloxacin | Yes |
| | | | | | 11 | S. aureus | Ciprofloxacin | Yes |
| | | | | | 12 | S. epidermidis | Ciprofloxacin | Yes |
| | | | | | 13 | S. epidermidis | Clindamycin | Yes |
| | | | | | 14 | S. aureus | Ciprofloxacin | Yes |
| | | | | | 15 | Staphylococcus spp. | Ciprofloxacin | Yes |
| | | | | | 16 | S. lugdunensis | Ciprofloxacin | Yes |
| | | | | | 17 | C. acnes | Clindamycin | No |
| | | | | | 18 | S. capitis | Moxifloxacin | Yes |
| | | | | | 19 | Enterococcus | Teicoplanin | No |
| | | | | | | faecium | | |
| | | | | | 20 | C. acnes | Clindamycin | No |

| | Knee | | | Hip | | |
|---------------------------|---------------|------|-----|-------|-----|-----|
| | Total | 1st | 2st | Total | 1st | 2st |
| Monobacterial PJI, n | 18 | 7 | 11 | 39 | 19 | 18 |
| Micro-organism, n | 30 | 17 | 13 | 41 | 21 | 20 |
| Species, n | | | | | | |
| - Staphylococcus spp | 15 | 10 | 5 | 28 | 13 | 15 |
| -S. aureus | 1 | 0 | 1 | 10 | 3 | 7 |
| -S. epidermidis | 9 | 7 | 2 | 9 | 4 | 5 |
| -S. lugdunensis | 0 | | | 1 | 0 | 1 |
| -S. caprae | 2 | 1 | 1 | 3 | 3 | 0 |
| -S. capitis | 1 | 0 | 1 | 4 | 2 | 2 |
| -S. haemolyticus | 0 | | | 1 | 1 | 0 |
| - Streptococcus spp | 4 | 2 | 2 | 4 | 2 | 0 |
| -S. milleri | 1 | 0 | 1 | 1 | 1 | 0 |
| -S. warneri | 1 | 1 | 0 | 0 | | |
| -S. vestibularis | 0 | | | 1 | 1 | 0 |
| - Cutibacterium acnes | 9 | 5 | 4 | 7 | 3 | 4 |
| - Corynebacterium spp | 1 | 0 | 1 | 0 | | |
| - Anaerobes | 1 | 0 | 1 | 0 | | |
| - Enterococcus spp | 0 | | | 1 | 0 | 1 |
| - Enterobacter spp | 0 | | | 1 | 0 | 1 |
| - Escherichia coli | 0 | | | 1 | 1 | 0 |
| N, number; 1st, one-stage | e; 2st, two-s | tage | | | | |

Table S2. Cultured micro-organisms (n=71) from all included patients (n=64)

| Case | Inclusion group | Reinfection/revision/DAIR | Time to failure (months) | Cultures PJI | Cultures new revision/DAIR | Description |
|------|--------------------|--|--------------------------------|--|-------------------------------|--|
| 1 | One-stage knee | Reinfection with two-stage revision | 19 | S. epidermidis Cutibacterium acnes | S. epidermidis | Fifteen months after revision, the patellar component was removed due to loosening. Intra-operative cultures were negative. However, patient had persisting diffuse joint effusion and erythema. Two separate intra-articular aspirations showed a resistant strain of <i>S. epidermidis</i> . Patient was treated with a two-stage revision and antibiotics. He recovered well and showed no signs of infection at latest follow-up (+2 years after two-stage revision). |
| 2 | Two-stage knee | Revision (not infection related) | 50 | Cutibacterium acnes | Negative | At fifty months follow-up patient had a revision due to asesptic loosening of the tibial component. Intraoperative cultures were negative. Patient is doing well and has shown no signs of infection. |
| 3 | Two-stage knee | Reinfection with DAIR | <1 | Granulicatella adiacens | S. epidermidis | Patient had persisting wound drainage during three weeks after reimplantation. A DAIR was performed. Cultures showed a new micro-organism. Patient was treated with teicoplanin and rifampicin for twelve weeks and recovered fully. |
| 4 | Two-stage knee | New infection with DAIR (unrelated to original PJI) | 49 | Cutibacterium acnes | Negative | Patient has history of venous insufficiency and suffered from a medial ulcer at the ipsilateral ankle. He then developed a cellulitis originating from the ulcer, which spread to this TKA one week after onset of symptoms, despite antibiotic treatment. Patient was treated with a DAIR, which revealed much intra-articular pus. Intraoperative cultures were negative, likely due to prior antibiotic treatment for ten days. Patient was treated with clindamycin for 12 weeks and recovered well. |

Table S3. Description of patients with reinfection, revision or DAIR.

| 5 | One-stage hip | Reinfection and revision (the latter not infection related) | 3 | E. coli | Not available | Patient developed an intraabdominal abscess with the same micro-organism as the PJI, due to insufficient infection control after revision. He receives chronic suppressive antimicrobial therapy with amoxicillin, which he tolerates well. Additionally, patient fell three months after the one-stage revision and sustained a periprosthetic fracture (Vancouver B2). A femoral stem revision and fracture fixation were performed. |
|---|------------------|---|----|------------------------|---|---|
| 6 | Two-stage hip | Revision (not infection related) | 99 | S. aureus | Negative | Ninety-nine months after revision, patient presented to the clinic with complaints of pain while mobilizing. Imaging showed radiolucent lines around the acetabular cup. A cup revision was performed. Intra-operative cultures were negative. Patient recovered well. |
| 7 | Two-stage hip | Revision (not infection related) with unexpectedly positive cultures with new micro-organism | 76 | S. aureus | S. capitis | Patient presented to the clinic with hip pain. Imaging showed a migrated loose cup. Preoperative joint aspiration was negative, but intra-operative cultures were unexpectedly positive. Patient was treated with clindamycin and rifampicin for twelve weeks. She showed no signs of infection at latest follow-up and a new joint aspiration was negative. |
| 8 | Two-stage hip | Reinfection and repeated DAIR | <1 | Cutibacterium acnes | DAIR 1: S. epidermidis Citrobacter koseri DAIR 2: S. epidermidis Cutibacterium acnes | Patient had persistent wound drainage and elevated serum inflammation markers, for which he was treated with two DAIRs within one month after reimplantation. Intraoperative cultures showed a superinfection. Patient was treated with vancomycin, ciprofloxacin and rifampicin and he recovered well. |