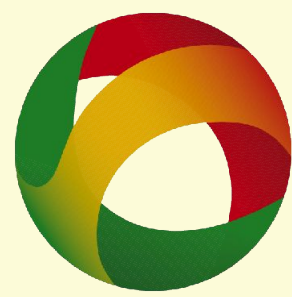


Periprosthetic Joint Infections Associated with Carbapenemase-Producing *Klebsiella pneumoniae*: A Case Series



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Introduction & Aim

Periprosthetic joint infection (PJI) caused by carbapenem-resistant *Klebsiella pneumoniae* (CRKP) is uncommon but therapeutically challenging, given limited antimicrobial options, frequent polymicrobial infection, and the need for repeated surgical source control. We describe the presentation, microbiology, management, and outcomes of **nine culture-confirmed CRKP-associated PJI cases** (retrospective descriptive case series).

Results — Case-by-Case Overview

Case	Joint / Clinical Setting	Co-pathogens	Surgical & Antimicrobial Strategy	Outcome
1	Late acute hip PJI due to <i>S. pneumoniae</i> → DAIR failure → CRKP superinfection	<i>P. aeruginosa</i> , <i>E. faecium</i> , <i>C. albicans</i>	DAIR → implant removal due to DAIR failure Imipenem/relebactam (6week) + linezolid + fluconazole	Clinical improvement. Reimplantation not planned (frailty)
2	Chronic knee PJI, acute superinfection – multiple prior staged revisions/spacer exchanges	<i>S. aureus</i> , <i>E. faecalis</i> , <i>C. parapsilosis</i>	Multiple stage revision, multiple spacer exchanges. Sequential imipenem/relebactam → ceftazidime/avibactam → meropenem/vaborbactam + daptomycin + fluconazol	Reimplantation was successful and clinical cure achieved with no relapse.
3	Chronic hip PJI with femoral osteomyelitis and necrotizing fasciitis	<i>C. albicans</i>	DAIR → implant removal due to DAIR failure; multiple debridement surgeries Meropenem/vaborbactam + fluconazole prolonged (> 12 weeks)	Implant removed; successful reimplantation 2 years later.
4	Chronic hip PJI – soft-tissue abscess	<i>P. aeruginosa</i> , <i>P. mirabilis</i>	Prosthesis removal – Girdleston Ceftazidime/avibactam (6 weeks)	Local stability, no recurrence; reimplantation not planned (frailty).
5	Chronic hip PJI – long-standing, multiple prior revisions	MRSE, <i>C. acnes</i> , <i>P. aeruginosa</i>	Multiple spacer exchanges High-dose meropenem → ceftazidime/avibactam + daptomycin (6 weeks)	Good response; successful reimplantation 1 year later.
6	Acute hip PJI	<i>M. morganii</i> , <i>P. mirabilis</i> , <i>E. faecalis</i>	Implant removal + spacer Ceftazidime/avibactam + ampicillin	Early postoperative death not directly related to the infection.
7	Acute hip PJI	<i>P. aeruginosa</i> , MRSE, <i>S. haemolyticus</i> , <i>E. faecium</i> , <i>C. parapsilosis</i>	DAIR → implant removal due to DAIR failure; multiple debridement surgeries Ceftazidime/avibactam + imipenem + linezolid + fluconazole (> 4 months, guided by clinical resolution)	Infection eradication with good clinical outcome No reimplantation (severe functional dependency due to ischemic stroke).
8	Acute hip PJI	MRSE, <i>P. aeruginosa</i> , <i>Enterobacter aerogenes</i> , <i>Candida albicans</i>	DAIR → implant removal due to DAIR failure; multiple debridement surgeries and percutaneous drainages Ceftazidime/avibactam + linezolid + fluconazole (> 4 months, guided by clinical resolution)	Infection eradication but severe functional dependency after prolonged hospitalization. Palliative care, no reimplantation.
9	Acute hip PJI	MSSA (with bacteremia), <i>S. epidermidis</i>	DAIR → implant removal due to DAIR failure; multiple debridement surgeries Imipenem/relebactam → ceftazidime/avibactam + doxycycline	Unfavourable course; death during index hospitalization after > 100 days of hospitalization.

Legend: DAIR, debridement, antibiotics, and implant retention; KPC, *Klebsiella pneumoniae* carbapenemase; MDR, multidrug-resistant; MRSE, methicillin-resistant *Staphylococcus epidermidis*; MSSA, methicillin-susceptible *Staphylococcus aureus*; PJI, periprosthetic joint infection; VRE, vancomycin-resistant *Enterococcus*.

Conclusions

CRKP-associated PJI are highly complex, usually occurring in medically and surgically vulnerable patients and often accompanied by **polymicrobial infection**. Successful management depends on **aggressive, repeated surgical source control together with susceptibility-guided therapy**, but prognosis remains guarded even with newer antimicrobial agents. These cases highlight the major burden imposed by multidrug-resistant Gram-negative pathogens in contemporary arthroplasty infection practice.

References

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