

## A Comparison of the Microbiology Profile for Periprosthetic Joint Infection (PJI) of Knee Arthroplasty and Lower Limb Endoprostheses in Tumour Surgery

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**Abstract :** Background and Objectives: The current antibiotic prophylaxis for oncological patients is based upon evidence from primary arthroplasty despite significant differences in both patient group and procedure. The aim of this study was to compare the microbiology organisms responsible for PJI in patients who underwent two-stage revision for infected primary knee replacement with those of infected oncological endoprostheses of the lower limb in a single institution. This will subsequently guide decision making regarding antibiotic prophylaxis at primary implantation for oncological procedures and empirical antibiotics for infected revision procedures (where the infecting organism(s) are unknown). Patient and Methods: 118 patients were treated with two-stage revision surgery for infected knee arthroplasty and lower limb endoprostheses between 1999 and 2019. 74 patients had two-stage revision for PJI of knee arthroplasty, and 44 had two-stage revision of lower limb endoprostheses. There were 68 males and 50 females. The mean age for the knee arthroplasty cohort and lower limb endoprostheses cohort were 70.2 years (50-89) and 36.1 years (12-78), respectively ( $p < 0.01$ ). Patient host and extremity criteria were categorised according to the MSIS Host and Extremity Staging System. Patient microbiological culture, the incidence of polymicrobial infection and multi-drug resistance (MDR) were analysed and recorded. Results: Polymicrobial infection was reported in 16% (12 patients) from knee arthroplasty PJI and 14.5% (8 patients) in endoprostheses PJI ( $p = 0.783$ ). There was a significantly higher incidence of MDR in endoprostheses PJI, isolated in 36.4% of cultures, compared to knee arthroplasty PJI (17.2%) ( $p = 0.01$ ). Gram-positive organisms were isolated in more than 80% of cultures from both cohorts. Coagulase-negative Staphylococcus (CoNS) was the commonest gram-positive organism, and Escherichia coli was the commonest Gram-negative organism in both groups. According to the MSIS staging system, the host and extremity grade of knee arthroplasty PJI cohort were significantly better than endoprostheses PJI ( $p < 0.05$ ). Conclusion: Empirical antibiotic management of PJI in orthopaedic oncology is based upon PJI in arthroplasty despite differences in both host and microbiology. Our results show a significant increase in MDR pathogens within the oncological group despite CoNS being the most common infective organism in both groups. Endoprosthetic patients presented with poorer host and extremity criteria. These factors should be considered when managing this complex patient group, emphasising the importance of broad-spectrum antibiotic prophylaxis and preoperative sampling to ensure appropriate perioperative antibiotic cover.

**Keywords :** microbiology, periprosthetic Joint infection, knee arthroplasty, endoprostheses

**Conference Title :** ICOOS 2023 : International Conference on Oncology and Orthopaedic Surgery

**Conference Location :** Dubai, United Arab Emirates

**Conference Dates :** January 30-31, 2023