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Microbiological Profile, Antimicrobial Treatment Patterns, and Clinical Outcomes in Patients Supported with HeartMate 3: A Single-Centre Retrospective Study

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Introduction: Driveline infections (DLIs) remain a major complication of durable left ventricular assist device (LVAD) support, contributing to patient morbidity and repeated hospitalisations. Early recognition, accurate clinical assessment, and standardised management are essential to prevent infection progression.[1,2] This study aimed to describe the microbiological profile, antimicrobial treatment patterns, and clinical outcomes in patients supported with the HeartMate 3 (HM3) LVAD.

Patients and Methods: This single-centre retrospective study included 52 patients who underwent their first HM3 LVAD implantation between November 2021 and October 2026, a five-year period selected to reflect contemporary microbiological and antimicrobial management practices. First DLI was retrospectively classified using the 2024 ISHLT clinical criteria, considering local signs of infection and supporting microbiological evidence. Kaplan–Meier analysis was used to estimate the time to first clinically confirmed DLI during HM3 support.

Results: The study included 52 patients (**Table 1**), of whom 20 (38%) developed a first clinically confirmed DLI over a median of 15.8 months of follow-up. Positive driveline exit-site cultures were docu-

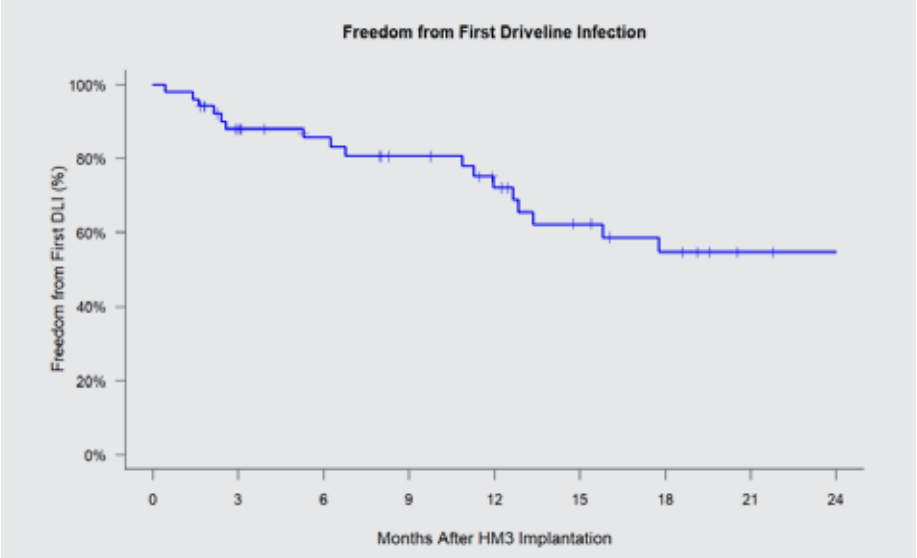


FIGURE 1. Freedom from first driveline infection.

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TABLE 1. Baseline characteristics, follow-up duration and comorbidities according to driveline infections status.

Characteristic	Overall (N = 52)	No DLI (N = 32)	DLI (N = 20)	p-value
Baseline characteristics				
Age, years	55 ± 14	56 ± 14	53 ± 14	0.24
Sex				0.41
Male sex, n (%)	45 (87%)	29 (91%)	16 (80%)	
Body weight, kg	86.1 ± 16.6	84.8 ± 15.7	88.3 ± 18.2	0.62
BMI, kg/m²	27.0 ± 4.3	26.4 ± 4.3	27.9 ± 4.3	0.15
Implantation strategy				0.74
BTT or BTC, n (%)	35 (67%)	21 (66%)	14 (70%)	
DT, n (%)	17 (33%)	11 (34%)	6 (30%)	
Follow-up duration, months	15.8 (8.0–30.1)	12.1 (3.5–20.0)	27.8 (13.1–37.4)	0.003
Baseline comorbidities				
Arterial hypertension, n (%)	22 (42%)	13 (41%)	9 (45%)	0.78
Diabetes mellitus, n (%)	16 (31%)	7 (22%)	9 (45%)	0.12
Dyslipidaemia, n (%)	27 (52%)	13 (41%)	14 (70%)	0.050
Obesity, n (%)	12 (23%)	6 (19%)	6 (30%)	0.50
Chronic kidney disease, n (%)	17 (33%)	9 (28%)	8 (40%)	0.54
Atrial fibrillation, n (%)	28 (54%)	21 (66%)	7 (35%)	0.046
Chronic obstructive pulmonary disease, n (%)	4 (7.7%)	2 (6.3%)	2 (10%)	0.63

Values are presented as mean ± SD, n (%), or median (Q1–Q3), as appropriate.

Baseline and follow-up variables: Wilcoxon rank-sum exact test, Fisher's exact test, or Pearson's chi-squared test, as appropriate. Comorbidities: Fisher's exact test. Comparisons are exploratory.

Abbreviations: HM3 – HeartMate3, DLI – driveline infection, BMI – body mass index, BTT – bridge to transplant, BTC – bridge to candidacy, DT – destination therapy, SD – standard deviation, Q1 – first quartile (25th percentile), Q3 – third quartile (75th percentile), IQR – interquartile

mented in 22 patients (2 of which have not met the clinical criteria for DLI). The most frequently isolated microorganism was *Staphylococcus aureus*, identified in 11 (55%) of patients with DLI. Repeated microbial isolation and polymicrobial findings were also observed. Among patients receiving antimicrobial therapy, 50% received at least one course of intravenous antibiotics, while all patients received oral antibiotic therapy during their treatment. The Kaplan–Meier estimates of freedom from first DLI are presented in **Figure 1.** At one-year post-implant, 72.2% of patients were free from first DLI.

Conclusion: This study provides insight into the longitudinal microbiological profile, antimicrobial treatment patterns, and clinical outcomes of patients receiving HM3 support. The findings may contribute to a better understanding of the complexity of antimicrobial management in this population and provide a basis for further optimisation of antimicrobial treatment strategies.

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