



Clinical Impact of 16S Ribosomal RNA Polymerase Chain Reaction on the Management of Periprosthetic Joint Infection

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Main Ideas:

Not all cases of suspected Periprosthetic Joint Infections (PJIs) necessarily benefit from 16S sequencing.

With suspected negative PJI cultures, 16S results valuably impact diagnostic change in cases. Thus, sequencing results can provide an additional piece of information in an otherwise challenging clinical scenario.

Introduction

- Molecular diagnostics are powerful tools for understanding PJIs
- Affect on clinical decisions of 16S rRNA sequencing test results in PJI is debated
- Goal: to examine if performing the 16S rRNA test in the setting of a PJI affected medical and surgical management decisions

Methods

- Retrospective analysis of patients who underwent 16S rRNA sequencing for suspected PJI from Jan 1, 2020 to June 30, 2025
- PJI defined according to EBJIS 2021 criteria
- Examination of clinical impact determined by:
 - Change in diagnosis
 - Introduction/change of antimicrobial therapy
 - Surgical management attributable to molecular results

Results and Discussion

Testing overview

914 16S rRNA tests ordered in study period
↓
42 Used for PJI diagnosis

PJI cases by joint (n = 42)

Knee 26
Hip 12
Shoulder 3
Ankle 1

Key takeaways

- Assay provides clinical utility when used selectively and appropriately
- 14% of infections were 16S dependent (negative culture, positive PCR)
- 26% of infections had positive culture and negative PCR (high!)
- Not all cases benefit from 16S test (especially positive culture cases)
- Negative PCR with negative culture gives more confidence to de-escalate antimicrobial regimens

Clinical impact of 16S testing

29%

of cases saw a clinical impact (12 of 42 cases)

- Infection control achieved — n = 10
- Septic revision needed — n = 2

Additional changes (16S-driven)

7 Diagnosis changed
12 Antibiotics modified
3 Surgical strategy altered