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EBJIS-MSIS 2026 | Case Report • e-Poster

INTRODUCTION & AIM

Culture-negative PJI remains a major diagnostic challenge because standard cultures may fail despite convincing clinical evidence of infection. Molecular methods can identify organisms that are difficult to recover by routine culture. [1,2,4,5]

Dielma fastidiosa is a rare Gram-negative anaerobic rod described within the human intestinal microbiota, with very limited evidence as a human pathogen. [6,7]

AIM

Describe a culture-negative knee PJI in which broad-range 16S rRNA PCR identified *D. fastidiosa*, and highlight how molecular testing changed antimicrobial management.

CASE AT A GLANCE

70-year-old man

- Prior right TKA complicated by Staphylococcus epidermidis PJI and two-stage revision
- Nine years after reimplantation: progressive knee pain and swelling after quadriceps tendon repair
- No organism recovered from 14-day synovial cultures despite strongly abnormal synovial testing
- Ultimately underwent explantation and antibiotic spacer placement

DIAGNOSTIC EVIDENCE

22–23k

synovial leukocytes / μ L

>90%

synovial neutrophils

+

alpha-defensin

14.6

serum CRP, mg/L

28

ESR, mm/h

14 d

cultures negative

EBJIS 2021

PJI was classified as confirmed despite negative cultures, emphasizing that microbiology is only one component of the diagnostic framework. [3]

ORGANISM PROFILE

D. fastidiosa

- Anaerobic, Gram-negative, rod-shaped organism in the family Erysipelotrichaceae [6]
- Originally described from human stool as part of intestinal flora [6]
- First reported bloodstream infection: diverticulitis-associated bacteremia in 2024 [7]
- To our knowledge, no prior prosthetic joint infection has been reported

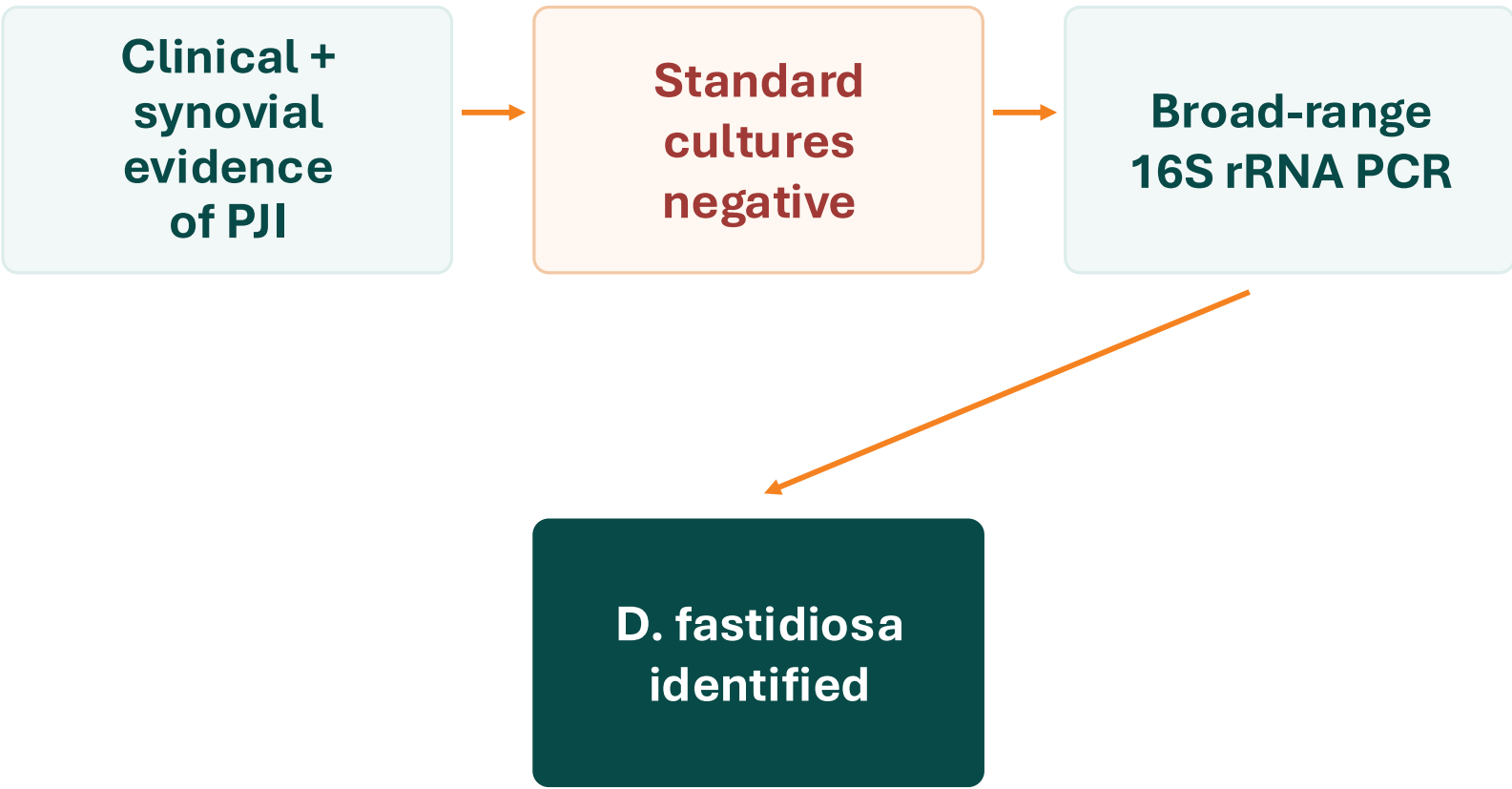
CITED LITERATURE

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2. Tan TL, et al. Culture-negative periprosthetic joint infection: an update on what to expect. JBJS Open Access. 2018;3:e0060.
3. McNally M, et al. The EBJIS definition of periprosthetic joint infection. Bone Joint J. 2021;103-B:18-25.
4. Rinaudo M, et al. Benefits of polymerase chain reaction combined with culture for diagnosis of bone and joint infections. Open Forum Infect Dis. 2019;6:ofz511.
5. Nguyen LL, et al. Diagnostic accuracy of 16S rDNA PCR, multiplex PCR and metagenomic NGS in PJI: systematic review and meta-analysis. Clin Microbiol Infect. 2025.
6. Ramasamy D, et al. Dielma fastidiosa gen. nov., sp. nov. Stand Genomic Sci. 2013;8:336-351.
7. Forman-Ankjær N, et al. First case of bacteraemia caused by Dielma fastidiosa in diverticulitis. APMIS. 2024;132:189-192.

DIAGNOSTIC TIMELINE



WHEN CULTURE WAS NOT ENOUGH



Broad-range 16S rRNA PCR can complement culture in difficult bone and joint infections and may improve organism detection when standard microbiology is unrevealing. [4,5]

TREATMENT COURSE

- 1

Explantation + spacer

Removal of prosthesis with antibiotic spacer placement after EBJIS-confirmed PJI.
- 2

Pathogen-directed change

After 16S identification, antimicrobial therapy was changed to IV daptomycin + ertapenem for extended anaerobic coverage.
- 3

Functional spacer revision

Because of limitations with the initial spacer, the patient underwent revision to an articulating antibiotic spacer with hinged components.
- 4

Suppressive therapy

2/5 specimens grew Cutibacterium acnes of uncertain significance; IV therapy completed, PICC removed, oral amoxicillin suppression initiated.

DIAGNOSTIC PIVOT

The molecular result was not merely descriptive: it changed the antimicrobial strategy toward extended anaerobic coverage.

OPERATIVE FINDINGS

- Cloudy effusion

Grossly abnormal joint fluid
- Synovitis

Marked inflammatory intra-articular findings
- Loose femoral component

Mechanical finding supporting infection
- Cultures negative

Routine intraoperative cultures failed to identify a pathogen

OUTCOME

LATEST FOLLOW-UP

WBAT

weight-bearing as tolerated

FULL

knee range of motion

MIN

minimal pain

No clinical evidence of persistent infection at latest follow-up.

WHY THIS CASE MATTERS

CULTURE-NEGATIVE $\neq$ INFECTION-NEGATIVE

- Negative cultures should not override concordant clinical, synovial, and intraoperative evidence of PJI.
- The EBJIS framework allows infection classification using multiple diagnostic domains rather than culture alone. [3]
- Broad-range 16S rRNA PCR can provide actionable organism identification in selected culture-negative cases. [4,5]
- Rare anaerobic organisms may be clinically relevant even when routine culture remains sterile.

CLINICAL IMPLICATIONS

- 1

Use the whole diagnostic picture

Persistent clinical suspicion plus abnormal synovial and operative findings should drive further investigation even when culture is negative.
- 2

Escalate diagnostics selectively

Broad-range molecular testing is most meaningful when conventional microbiology is unrevealing but pretest probability remains high.
- 3

Make the result clinically actionable

In this case, organism identification directly altered antimicrobial management toward anaerobic coverage.

LIMITATIONS

- Single-patient observation limits generalizability.
- Clinical significance of *C. acnes* growth in 2/5 later specimens remains uncertain.
- Molecular detection must be interpreted in clinical context and does not replace conventional microbiology.

TAKE-HOME MESSAGE

When culture is negative but the joint still meets clinical criteria for infection, broad-range 16S rRNA PCR can reveal an otherwise hidden pathogen and materially change treatment.