Early Diagnosis of Hip Periprosthetic *Candida spp* Infections: Case Studies in Orthopedic Surgery at Consorci Sanitari de Terrassa (Barcelona)

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BACKGROUND

Periprosthetic infections caused by *Candida* species in orthopedic surgeries present formidable hurdles due to biofilm formation and resistance to standard treatments. Effective management necessitates multidisciplinary strategies for the prevention, diagnosis, and treatment of patients with this rare but increasingly frequent cause of infection.

CASE(S) DESCRIPTION

A) Medical history

Early prosthetic hip infection

Case 1

Female, 79 years old

Antibiotic pressure

Extended wound drainage

Previous surgeries

August 2022 — **First surgery**

Left Acetabular fracture:

Acetabular Osteosynthesis +

Total Hip Prosthesis

September 2022 — Vancomycin — **Second surgery**

Cupcage + Cemented stem with acetabular mobilization

Intraoperative cultures positive for ***S. epidermidis***

October 2022 — Daptomycin + Piperaciline/Tazobactam — **Third surgery**

Surgical debridement +

femoral head replacement.

Intraoperative cultures positive for ***Candida albicans***

Daptomycin **+ CASPOFUNGIN+ FLUCONAZOLE**

(After microbiology results)

December 2022 — Linezolid + **FLUCONAZOLE** (Discharge treatment)

Case 2

Female, 86 years old

Chronic renal insufficiency

Antibiotic pressure

Previous surgeries

June 2022 — **First surgery**

Right femur

Pertrochanteric fracture:

Osteosynthesis Long

Gamma nail

November 2022 — **Second surgery**

Removal of Gamma nail +

Implantation of a Total Hip

Prosthesis with a stem

December 2022 — Vancomycin — **Third surgery**

DAIR (debridement, antibiotics,

and implant retention)

Intraoperative culture positive for ***S. epidermidis***

Dalvabancin*

(Discharge treatment)

*Linezolid toxicity

June 2023 — Vancomycin + Ciprofloxacin — **Fourth surgery**

Periprosthetic abscess:

DAIR

Admitted to ICU due to septic shock in the immediate postoperative period.

Intraoperative culture positive for ***Candida albicans***

Vancomycin **+ Ciprofloxacin + FLUCONAZOLE**

(After microbiology results)

Doxycycline + **FLUCONAZOLE** (Discharge treatment)

B) Microbiological diagnosis

In both cases, the initial isolation of *Candida* species was achieved from joint fluid **previously inoculated in a blood culture bottle**. The bottles were incubated at 37°C under **aerobic** conditions using the **BD BACTEC™ FX system**. Following a positive result, Gram staining was conducted, and *Candida albicans* was subsequently identified through the **FilmArray PCR Sepsis (BCID) panel.**

Intraoperative culture positive for ***Candida albicans***

Patient	Samples	Location of positive samples	Isolation/Detection *MALDI-TOF MS/Filmarray PCR Sepsis	Time to isolation (hours)
Case 1	7 samples **4 Positives** 3 Negatives (Deep tissue, 2 Intra-articular samples)	**Suprafascial**	Thioglycollate broth subculture	96
		Subfascial	Direct plates	72
		Synovial fluid (2 aerobic bottles)	Blood culture bottles + molecular detection*	30 + 2*
Case 2	7 samples **2 positives samples** 5 Negatives (Subfascial, Posterior and Distal zone samples, Peritrochanteric sample, Sonicated Trochanteric Screw)	**Synovial fluid** No bottle inoculation	Thioglycollate broth subculture	96
		Synovial fluid (1 aerobic bottle)	Blood culture bottles + molecular detection*	27 + 2*

Table 1. Microbiological diagnostic features of *Candida albicans* isolation.

* Samples, with the exception of the synovial fluids, were inoculated onto agar plates and thioglycollate enrichment medium, which will be subcultured if macroscopic signs of growth are observed or systematically after 5 days.

CONCLUSIONS

Awareness of **risk factors**, such as previous bacterial prosthetic infections, antibiotic exposure, multiple interventions and comorbidities is important to understand *Candida* as a pathogen in prosthetic joint infections.

- Both patients had a history of **chronic *Staphylococcus epidermidis* infection** and a recent history of multiple surgeries.
- In both cases fluconazole was chosen as suppressive antifungal therapy at discharge. However, in **Case 1 there were new recurrences** and it was decided to change the treatment to caspofungin due to the suspicion of azole resistance. Guidelines recommend the association of an azole with an antifungal drug with antibiofilm activity such as candins or amphotericin.
- Inoculation of joint fluid in blood culture bottles **increases the sensitivity of the diagnosis and allows early detection** of the aetiological agent.

Future studies with larger numbers of cases will be necessary.