

Association between body mass index and failure after DAIR or DAPRI for acute hematogenous knee periprosthetic joint infection

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CLINICAL QUESTION & METHODS

INTRODUCTION

Acute hematogenous knee PJI is a limb- and implant-threatening complication. DAIR preserves well-fixed components and reduces surgical burden, while DAPRI adds local antibiotic-loaded calcium sulfate beads. Failure remains common and patient selection is crucial.

STUDY AIM
To explore host, microbiological and laboratory factors associated with additional surgery within 12 months after DAIR or DAPRI for acute hematogenous knee PJI.

STUDY DESIGN

Design: retrospective multicenter cohort; 3 Italian referral centers.
Period: January 2023-December 2025.
Population: consecutive EBJIS-confirmed acute hematogenous knee PJIs.
Follow-up: minimum 12 months; mean 28.0 ± 14.6 months.
Primary outcome: any additional surgical procedure within 12 months.

IMPLANT-RETENTION ELIGIBILITY

Symptoms ≤4 weeks
Well-fixed prosthetic components
No radiographic loosening
Adequate soft-tissue coverage
No sinus tract

SURGICAL PATHWAY

- 1 **Extensive open debridement**
Multiple intraoperative samples and confirmation of implant stability.
- 2 **Exchange all modular components**
Including the polyethylene insert in every case.
- 3 **DAIR or DAPRI**
DAPRI added 10 cc absorbable antibiotic-loaded calcium sulfate beads.
- 4 **Targeted antimicrobial therapy**
Empirical IV treatment after sampling, then culture-directed management with infectious-disease input.

COHORT SNAPSHOT

n = 35
acute hematogenous knee PJI

71.8 y
mean age

68.6%
male

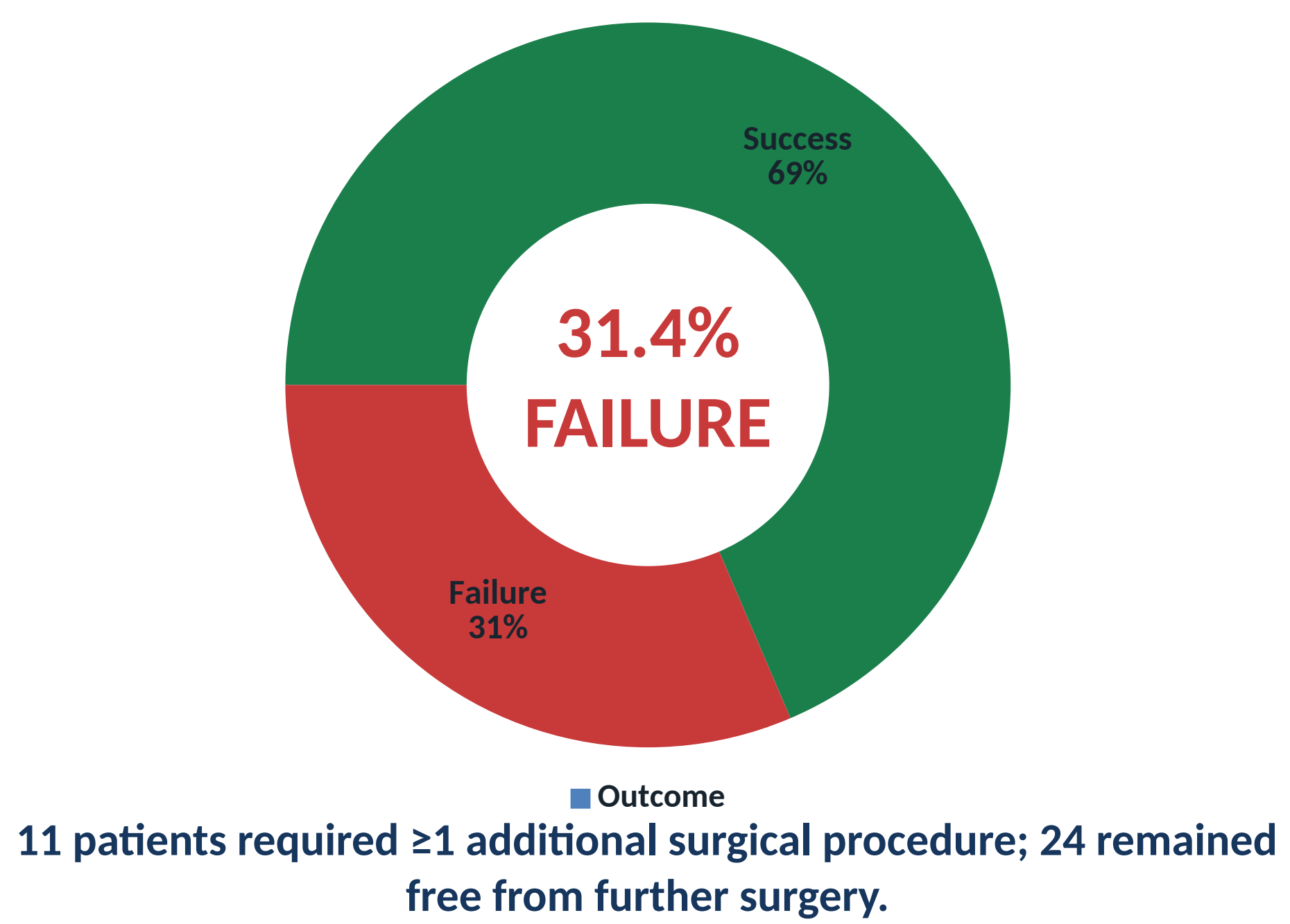
29.5
mean BMI, kg/m²

28 DAIR (80.0%) | 7 DAPRI (20.0%)

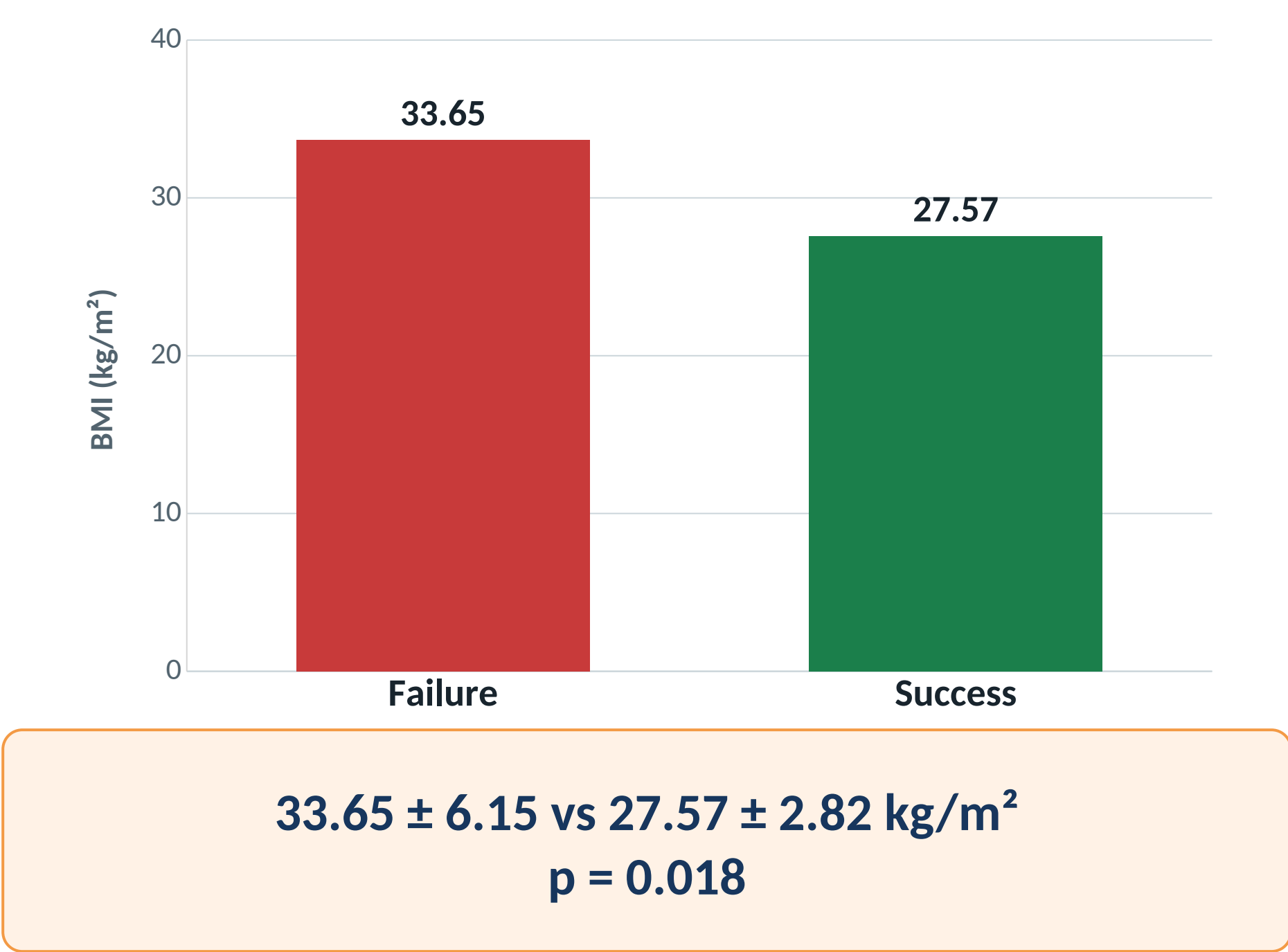
All findings were analyzed as exploratory, unadjusted associations because only 11 failure events were available.

RESULTS & ORTHOPAEDIC IMPLICATIONS

PRIMARY OUTCOME AT 12 MONTHS



BMI WAS HIGHER IN FAILURES



PREOPERATIVE HOST PROFILE

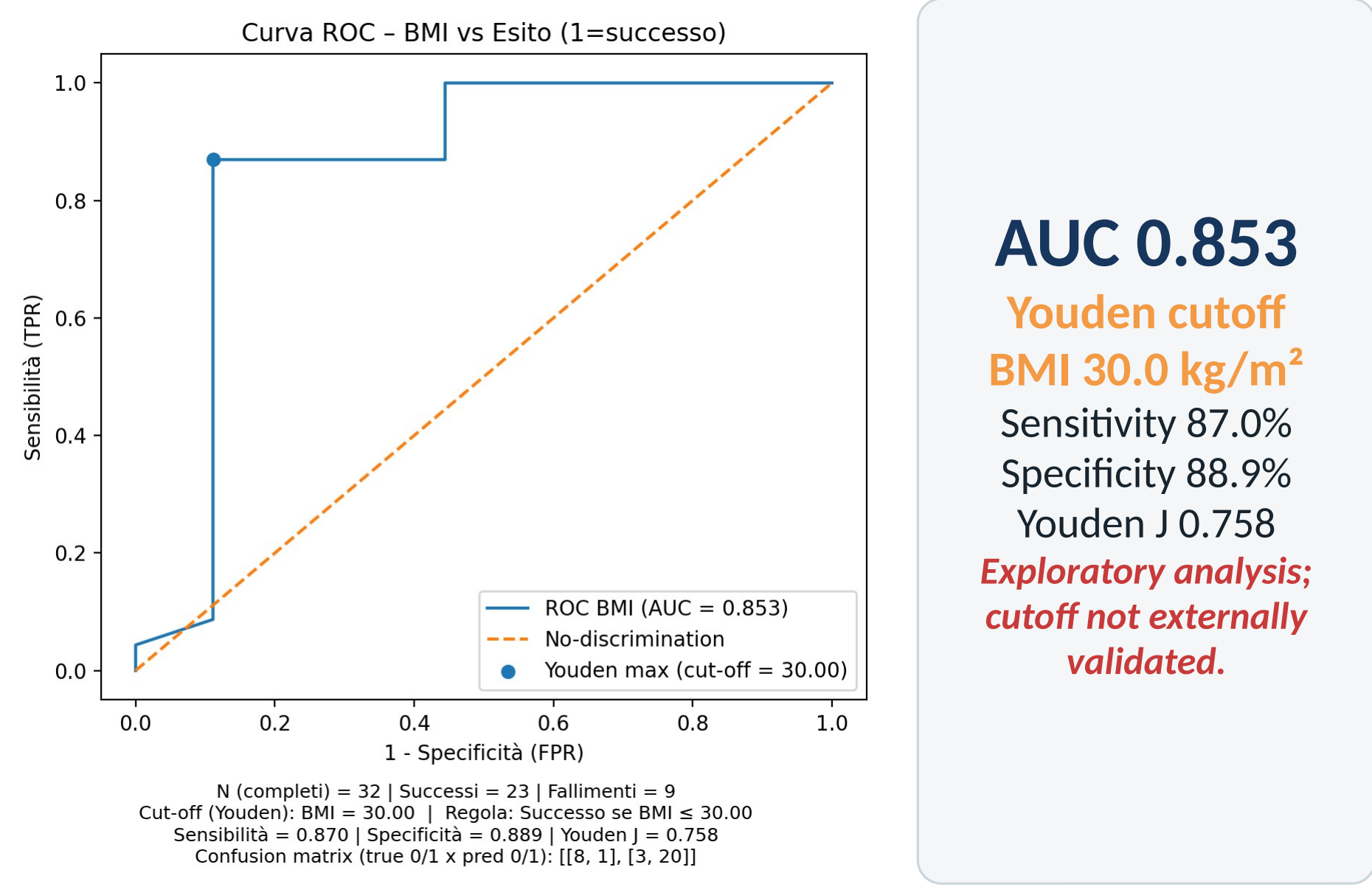
Variable	Failure	Success	p
Hb, g/dL	10.47 ± 1.58	11.86 ± 1.67	0.042
Albumin, g/L	29.62 ± 0.92	34.29 ± 3.42	0.001
PNI	36.42 ± 2.12	41.46 ± 4.83	<0.001

Failure clustered with obesity, anemia and nutritional depletion - a potentially modifiable host profile before or alongside implant-retention treatment.

NO OBSERVED BETWEEN-GROUP DIFFERENCE

Procedure type: DAIR vs DAPRI, p = 0.392.
Age: 75.18 vs 70.29 years, p = 0.147.
Sex: p = 0.263.
Inflammatory/composite indices: no signal for CRP, NLR, MLR, PLR, SII, SIRI, LCR, CALLY or HALP.

EXPLORATORY ROC ANALYSIS - BMI



MICROBIOLOGY

94.3%
culture-positive

75.8%
monomicrobial among positive

Staphylococci predominated; MSSA was the most frequent isolate.

MSSA: 15 isolates
Staphylococcus epidermidis: 8 isolates
Polymicrobial infection: 8/33 culture-positive cases
Culture-negative: 2/35 patients

WHAT THIS MEANS FOR SURGEONS

Do not assess the infection alone: host condition may influence the chance of implant retention.
Screen routinely available markers: BMI, hemoglobin, albumin and PNI identified a less favorable preoperative profile.
Optimize where timing allows: nutrition, anemia, soft tissues and multidisciplinary antimicrobial planning.
Keep selection principles central: short symptom duration, stable implants, exchangeable modular parts and adequate soft-tissue coverage.

CONCLUSION
Nearly one-third of patients required further surgery within 12 months after DAIR or DAPRI. Failures had higher BMI and lower preoperative hemoglobin, albumin and PNI in exploratory univariate analyses.
CLINICAL MESSAGE: host optimization deserves attention when planning implant-retention treatment.

LIMITATIONS

Retrospective design and small cohort.
Residual confounding and available-case analysis.
Center-specific heterogeneity could not be modeled.
Only 7 DAPRI cases: not powered to compare DAIR with DAPRI.
Outcome was additional surgery within 12 months, not a broader composite PJI endpoint.

SELECTED REFERENCES

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