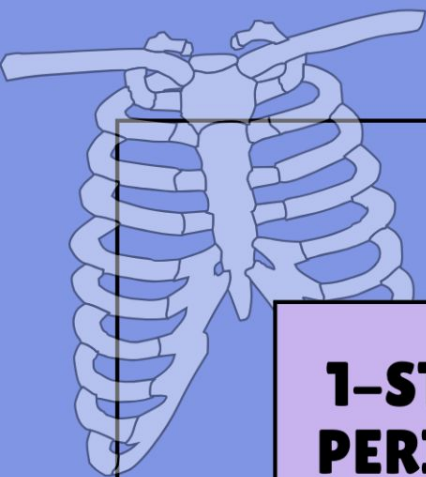
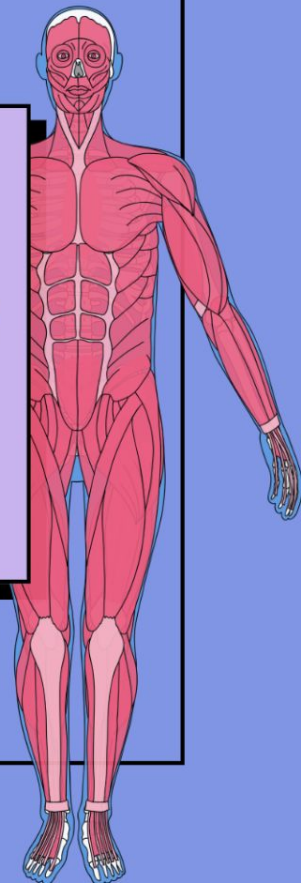




1-STAGE VS. 2-STAGE REVISION SURGERY FOR PERIPROSTHETIC HIP INFECTION: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF CLINICAL OUTCOMES

Lamo-Espinosa, José María PhD; Mariscal, Gonzalo PhD; Gómez-Álvarez, Jorge MD; Font-Vizcarra, Lluís PhD; del Pozo, Jose Luis PhD; San-Julián, Mikel PhD



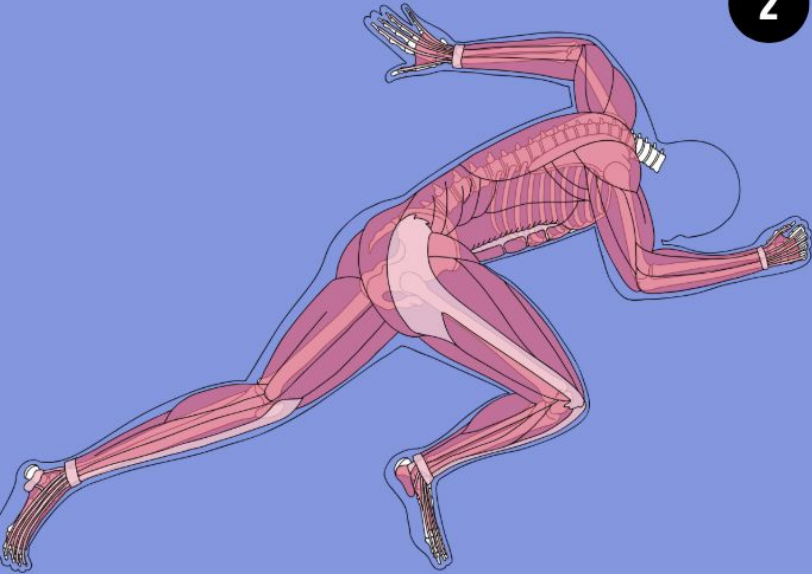
BACKGROUND

1

Periprosthetic infections

2

1-stage vs 2-stage arthroplasties



PAPROSKY CLASSIFICATION – HIP

TYPE 1

Minimal bone loss

Intact teardrop & ischium

TYPE 2

- IIA: intact teardrop and ischium, superior bone loss < 2 cm
- IIB: intact teardrop and ischium, superior bone loss 2–3 cm
- IIC: teardrop obliterated, destruction of medial wall

TYPE 3

- IIIA: acetabular bone loss from 10–2 o'clock with incomplete destruction of teardrop and ischium (“up and out”)
- IIIB: acetabular bone loss from 9–5 o'clock with teardrop obliterated (“up and in”)

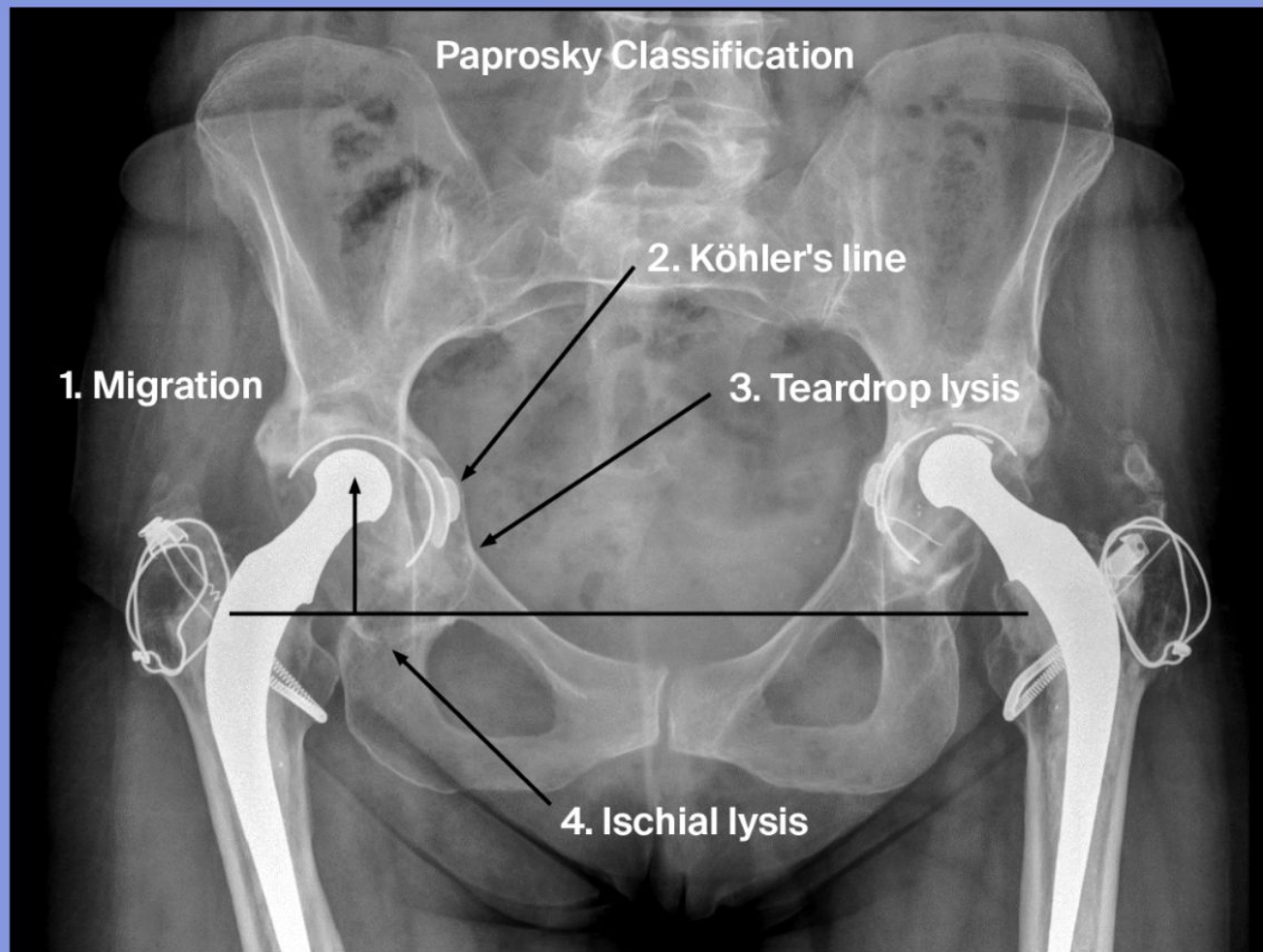


Figure 1: Radiographic features of Paprosky Classification (Courtesy of George Macheras)

PAPROSKY CLASSIFICATION – FEMUR

TYPE 1

Minimal metaphyseal bone loss

TYPE 2

Extensive metaphyseal bone loss
No diaphyseal loss

TYPE 3

Extensive metaphyseal and diaphyseal bone loss

- IIIA: > 4 cm intact bone proximal to isthmus
- IIIB: < 4 cm intact bone proximal to isthmus

TYPE 4

Unsupportive diaphysis – beyond isthmus

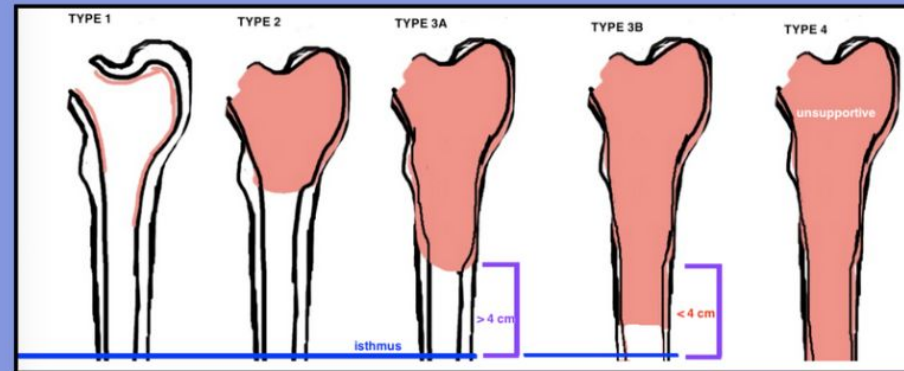


Figure 2: Graphic of Paprosky Classification (Courtesy of Bert Parcells)

PPICO

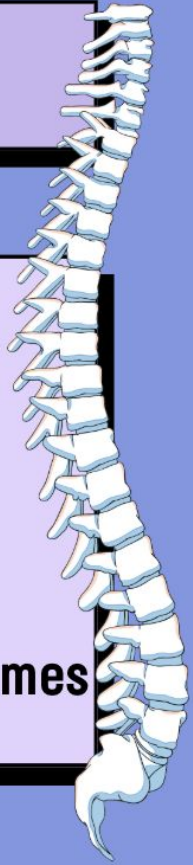
P: 9 cohorts; 2,502 hips

P: Periprosthetic hip infections

I: Revision

C: 1-stage vs. 2-stage

O: Post-op reinfection & complication rates, functional outcomes



METHODS

INCLUSION

- 18 years or older who had THA revision
- 1-stage and 2-stage strategies

EXCLUSION

- Noncomparative case series/reports w/o control
- Retrospective outcomes w/o contemporaneous data collection

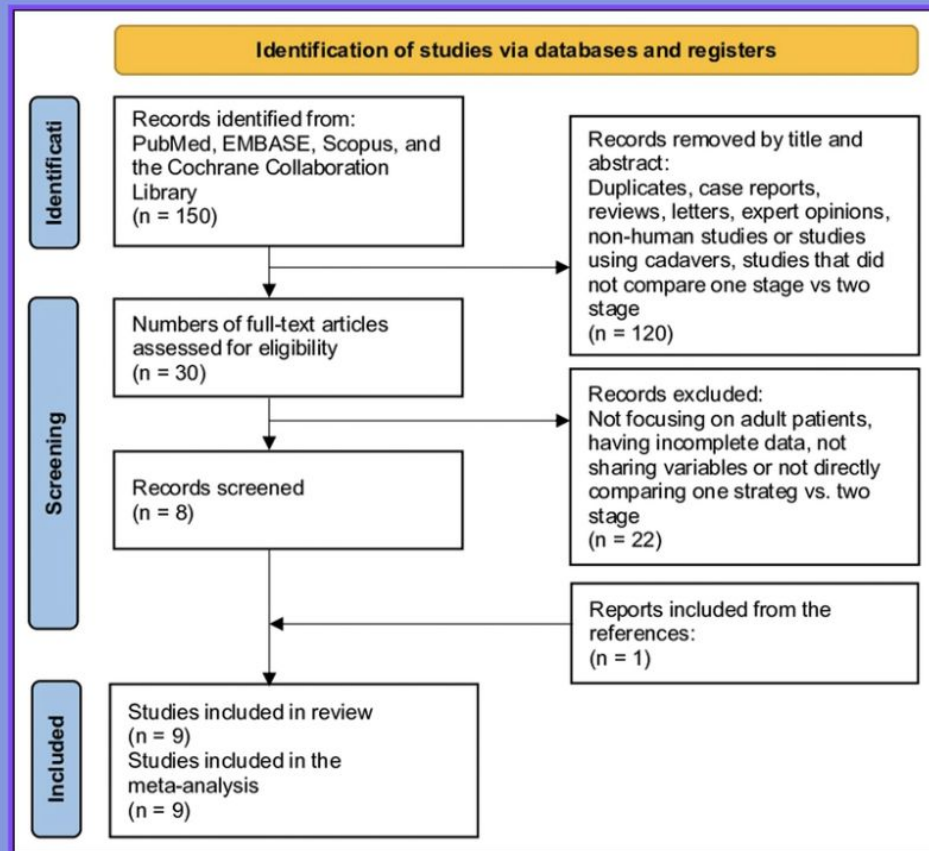
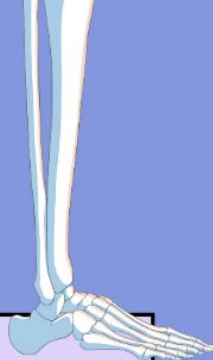


Figure 3: PRISMA flowchart displaying study selection process for meta-analysis

Study	Type of Study	Period	Follow-Up (yr)	Region	Hips (One-Stage/Two-Stage) (N)	Female (One-Stage/Two-Stage)	Age (One-Stage/Two-Stage)	Approach	Cement
Choi et al 2013	Retrospective cohort	1999 to 2009	1.0	United States	17/66	8/31	NS	NS	40 g of cement with 2.4 g of tobramycin and 1.0 g of vancomycin
De Man et al 2011	Retrospective cohort	1985 to 2004	2.0	Switzerland	22/50	12/21	69/70	Straight lateral approach	Gentamicin cement
Klouche et al 2012	Retrospective cohort	2002 to 2006	2.0	France	38/46	18/20	63./66.9	Posterior lateral in 26 cases and anterolateral in 12 patients	Cement used was not antibiotic-loaded
Oussedik et al 2010	Prospective cohort	1999 to 2002	6.8	United Kingdom	nov-39	NS	NS	Posterior	The cement used was antibiotic-loaded impregnated with gentamicin
Sharqzad et al 2018	Retrospective cohort	1997 to 2009	NS	Germany	184/90	82/45	70.5/63.3	NS	Cemented prosthesis with antibiotic-loaded bone cement
Sotiriou et al 2020	Retrospective cohort	2002 to 2016	2.0	Sweden	Sept-46	NS	NS	NS	Cement containing gentamycin and vancomycin
Svensson et al 2019	Retrospective cohort	1979 to 2015	10.9	Sweden	404/1,250	158/496	70/68	NS	Cemented (82.4% one-stage and 58.6% two-stage)
Tirumala et al 2021	Retrospective cohort	2014 to 2018	1.4	United States	46/92	21/47	68.9/68.2	Posterolateral	2 g of vancomycin and 2.4 g of tobramycin per package of cement
Wolf et al 2014	Retrospective cohort	1985 to 2004	2.0	Austria	37/55	19/26	67.0/60.4	NS	Cement augmented with gentamycin. In addition 1 g vancomycin was added to 40 mg
NS = Not specified.									

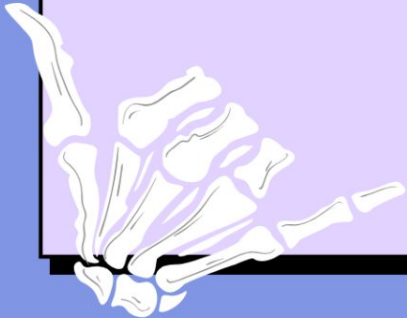
Table 1: Study characteristics

RESULTS

PAPROSKY

1-Stage: Paprosky 1

2-Stage: Paprosky 3



SUCCESS & REINFECTION

No significant difference between 1-Stage and 2-Stage

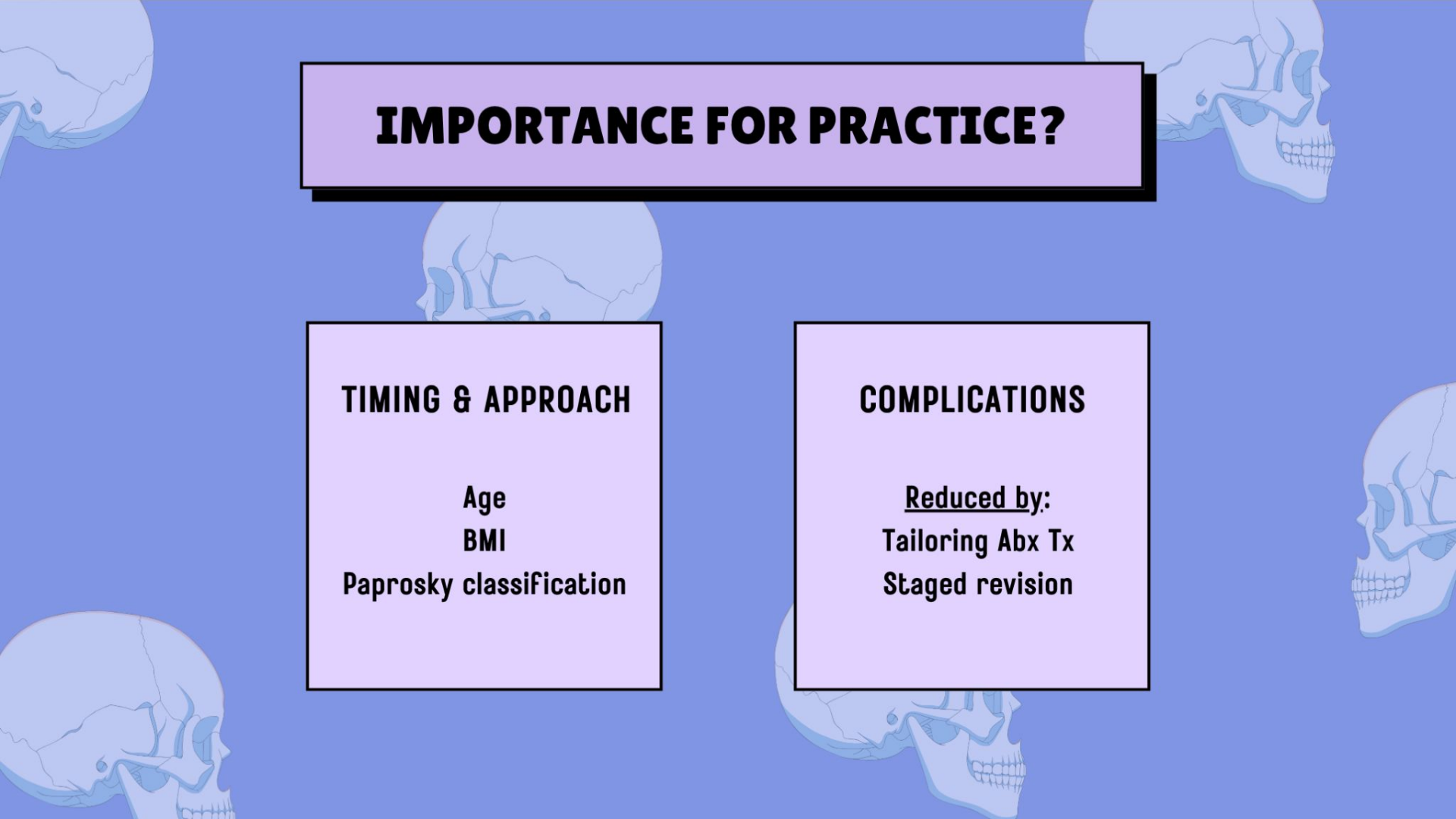
QUALITY OF LIFE

Higher reported Harris Hip Score in 1-Stage

LIMITATIONS

- **8/9 studies retrospective**
- **Small N**
- **Unknown timeframe between primary sx and revision**
- **Reporting QOL**



The background of the slide is a solid blue color, decorated with several light blue, stylized human skulls. These skulls are positioned around the edges of the slide, with some partially visible and others more prominent. The skulls are rendered in a simple, almost cartoonish style with visible eye sockets, nasal cavities, and teeth.

IMPORTANCE FOR PRACTICE?

TIMING & APPROACH

Age
BMI
Paprosky classification

COMPLICATIONS

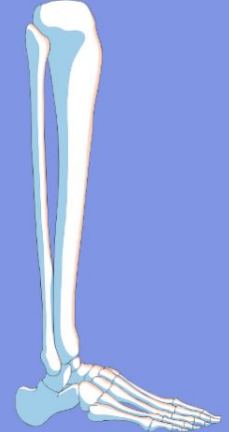
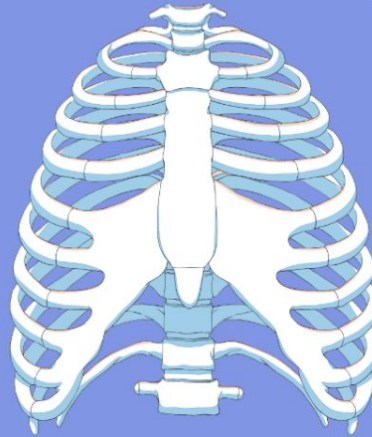
Reduced by:
Tailoring Abx Tx
Staged revision

CONCLUSIONS

No significant differences
between 1-stage and 2-stage
surgical revisions

QOL is better in 1-stage

Insights to refine the
surgical approach to
managing infected hip
arthroplasties



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Lamo-Espinosa, J-M., Mariscal, G., Gómez-Álvarez, J., Font-Vizcarra, L., del Pozo, J-L., San-Julián, M. (2025). One-Stage Versus Two-Stage Revision Surgery for Periprosthetic Hip Infection: An Updated Systematic Review and Meta-Analysis of Clinical Outcomes. Journal of the American Academy of Orthopaedic Surgeons. <https://doi.org/10.5435/JAAOS-D-24-00456>

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