HK53: Is there a role for arthroscopy in performing debridement, antibiotics, and implant retention for patients with acute periprosthetic joint infection?

Carl Haasper, Ignacio Sanchez, Javier Martinez Ros, Felix C. Vichez, Jose Baeza-Oliete, Robert McCulloch, Haobo Wu, Pawel Chodór, Francisco Arguelles Linares

Response/Recommendation: Except in rare (palliative) cases, arthroscopy should not be used to perform debridement, antibiotics, and implant retention (DAIR).

Level of Evidence: Limited

Delegate Vote:

Rationale:

Debridement, antibiotics, and implant retention (DAIR) is a commonly utilized treatment strategy for acute periprosthetic joint infection (PJI), aiming to preserve the implant while controlling infection. While DAIR is traditionally performed as an open procedure, some studies have explored arthroscopy as a minimally invasive alternative for select cases. During the ICMspell out please 2013, it was voted that arthroscopy plays no role in DAIR [5, 6]. This was confirmed by other authors [2].
However, arthroscopy offers a minimally invasive approach and potentially reduces postoperative pain and recovery time. With specialized instruments, arthroscopy enables targeted debridement and lavage, which could theoretically reduce the bacterial load in cases with early, localized infection. Additionally, arthroscopy may allow the placement of antibiotic-laden materials in deep structures without fully exposing the joint capsule. Literature reports mixed outcomes for arthroscopic DAIR in acute PJI, with infection eradication rates lower than the typical rates reported for open DAIR. The successful DAIR procedure should not be considered a washout [13].

A case series of 16 patients showed a 38% survival rate for total knee arthroplasties (TKAs) treated with arthroscopic DAIR, with a mean follow-up of 64 months. [14] An earlier study showed in one case treating knees had an inferior outcome for arthroscopic treatment [10]. A review concluded not to consider arthroscopy because it does not allow adequate debridement or exchange of the polyethylene insert [11]. Arthroscopic washout in acute infections is reported with much lower success rates when compared to open debridement [1, 3, 4, 9, 12, 14]. All studies report retrospective data in terms of small series and case reports. However, in palliative situations, arthroscopy may be considered. For high-risk patients, arthroscopic debridement with continuous irrigation can be an alternative treatment to improve the quality of life during survival [7].

An early series on arthroscopic DAIR for late acute infections in total hip arthroplasty (THA) reported excellent success in eight consecutive patients, who had a mean follow-up of 70 months [8].

The success of arthroscopic DAIR appears to be highly dependent on careful patient selection and seems to be acceptable in THA. Suitable candidates are typically those who had early, acute PJI, limited infection spread, and no systemic signs of sepsis. Arthroscopic DAIR may be particularly advantageous for patients at substantial risk for complications associated with open surgery, such as those who have comorbidities that limit wound healing. However, success rates are lower, at least in TKA.

Comparative Efficacy and Outcomes

Although arthroscopy has certain advantages, current evidence does not consistently demonstrate sufficient infection control compared to open DAIR. In carefully selected cases, the benefits of a minimally invasive approach may outweigh the lower infection control rates.

References:

1. Bartsch A, Krenn P, Lubberts B et al (2023) Management of acute periprosthetic knee infection: a comparison of arthroscopic and open debridement. Arch Orthop Trauma Surg 143:4309–4316. doi: 10.1007/s00402-023-04782-5
2. Boyer B, Cazorla C (2021) Methods and probability of success after early revision of prosthetic joint infections with debridement, antibiotics and implant retention. Orthop Traumatol Surg Res 107:102774. doi: 10.1016/j.otsr.2020.102774
3. Byren I, Bejon P, Atkins BL et al (2009) One hundred and twelve infected arthroplasties treated with „DAIR" (debridement, antibiotics and implant retention): antibiotic duration and outcome. J Antimicrob Chemother 63:1264–1271. doi: 10.1093/jac/dkp107
4. Chung JY, Ha CW, Park YB, Song YJ YK (2014) Arthroscopic debridement for acutely infected prosthetic knee: any role for infection control and prosthesis salvage? Arthroscopy 30:599–606.
5. Haasper C, Buttaro M, Hozack W et al (2014) Irrigation and Debridement. J Arthroplasty. doi: 10.1016/j.arth.2013.09.043
6. Haasper C, Buttaro M, Hozack W et al (2014) Irrigation and debridement. J Orthop Res. doi: 10.1002/jor.22556
7. Jeon YS, Kim MK, Kwon DG et al (2023) Palliative arthroscopic debridement with continuous irrigation for infected total knee arthroplasty in high mortality risk patients. Int Orthop 47:175–186. doi: 10.1007/s00264-022-05632-6
8. JL H, EA S, CT L et al (1999) The arthroscopic drainage, irrigation, and débridement of late, acute total hip arthroplasty infections: average 6-year follow-up. J Arthroplast 14:903–910. doi: 10.1016/s0883-5403(99)90001-3
9. Johns BP, Loewenthal MR, Davis JS, Dewar DC (2020) Open Debridement is Superior to Arthroscopic Debridement for the Infected Total Knee Arthroplasty. J Arthroplasty 35:3716–3723. doi: 10.1016/j.arth.2020.06.039
10. MB H, TK F, Jordan L, HJ N (1991) Periprosthetic knee sepsis. The role of irrigation and debridement. Clin Orthop Relat Res 113–118.
11. Qasim SN, Swann A, Ashford R (2017) The DAIR (debridement, antibiotics and implant retention) procedure for infected total knee replacement – a literature review. SICOT-J 3:2. doi: 10.1051/sicotj/2016038
12. VASSO M, CAPASSO L, CORONA K et al (2022) Periprosthetic knee infection: treatment options. Orthop Rev (Pavia) 14:37537. doi: 10.52965/001c.37537
13. Vaz K, Taylor A, Kendrick B, Alvand A (2022) A guide to debridement, antibiotics, and implant retention. Ann Jt 7:5–5. doi: 10.21037/aoj-20-89
14. Waldman BJ, Hostin E, Mont MA, Hungerford DS (2000) Infected total knee arthroplasty treated by arthroscopic irrigation and débridement. J Arthroplasty 15:430–436. doi: 10.1054/arth.2000.4637

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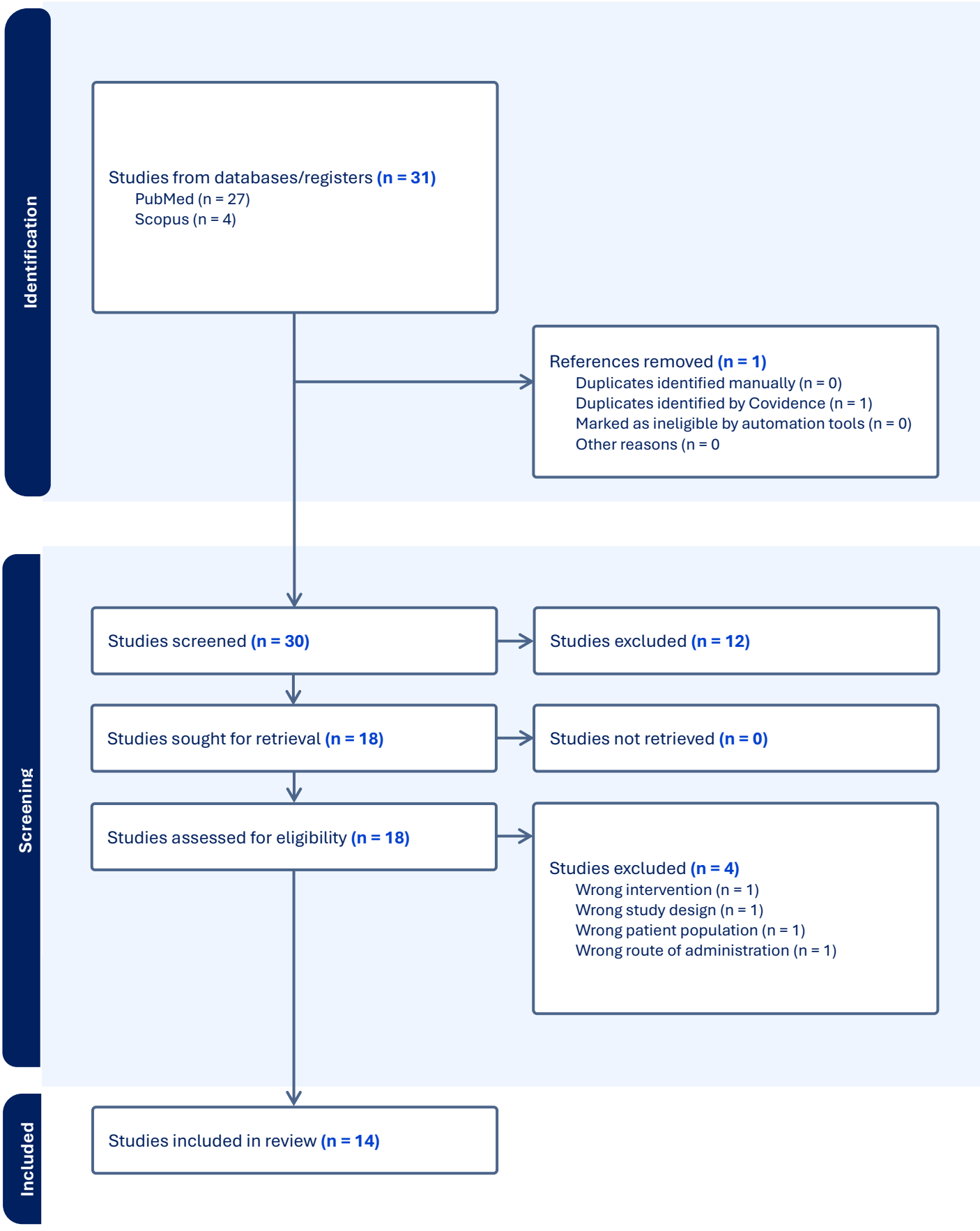
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Studies excluded (n = 4)
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Wrong study design (n = 1)
Wrong patient population (n = 1)
Wrong route of administration (n = 1)
Included
Studies included in review (n = 14)