SH82: Should well-fixed glenoid components be removed during surgical treatment for subacute or chronic shoulder periprosthetic joint infection (PJI)?

Liaison: Surena Namdari
Lead Delegate: Harvinder Singh
Supportive Delegates: Puneet Monga; Raúl Barco Laakso MD
Supportive Author: Faheem Bhatti

Response: We recommend removal of glenoid components in the treatment of sub-acute or chronic shoulder PJI; however, there may be situations where patients and surgeons select to accept a higher re-infection rate to reduce the morbidity associated with implant removal.

Strength of Recommendation: Limited

Delegate Vote: 51 (100%) agree; 0 disagree; 0 abstain

Rationale: A systematic literature search was performed to identify all studies on surgical treatment of subacute and chronic shoulder periprosthetic joint infection (PJI). The terms 'shoulder arthroplasty infection' and 'shoulder replacement infection' were used to search the Pubmed and Scopus databases for relevant studies, following the same search strategy as the 2018 International Consensus Meeting (ICM) report on this topic (1). A filter was applied to only show studies with a publication year of 2018 onwards, to capture new studies which were not included in the 2018 ICM report (1). Inclusion criteria were studies that specified shoulder PJI or revision arthroplasty, stated the surgical procedure used (i.e. irrigation and debridement, or one-/two- stage revision), and reported treatment success or failure rates. Duplicates, editorials, narrative reviews, and technique articles were all excluded.

As of 4th December 2024, a total of 1863 unique studies were put forward for title and abstract screening. Eighty-seven full texts were screened, and 29 relevant studies were identified. No studies specified assessing outcomes following removal or retention of 'well-fixed' glenoid components. The most recently published meta-analyses reporting outcomes following debridement with component retention (2), and one-stage versus two-stage revision (3) were identified. The reference lists of these two meta-analyses were reviewed to find studies identified by our search which were not included in their analyses. The results of these two meta-analyses (2,3) and further studies not included in their analyses are summarised in Table 2.

Table 2: Overview of identified literature:

Study	Date	Study design	# Treated with I&D and component retention	# Failed treatment (%)	# Treated w/ one stage revision	# Failed treatment (%)	# Treated w/ two stage revision	# Failed treatment (%)
Bdeir (3)	2024	Meta-analysis	-	-	378	41 (10.9% [6.5-16.4%])	666	86 (12.9% [9.6-16.6%])
Mercurio (2)	2019	Meta-analysis	81	28 (34.0%)	-	-	-	-
Hansen (4)	2024	Retrospective case series	3	1 (33.33%)	-	-	16	6 (37.5%)

Hollier-Larousse (5)	2024	Retrospective case series	-	-	34	3 (8.8%)	-	-
Givens (6)	2024	Retrospective case series	-	-	139	7 (5.0%)	18	6 (33.3%)
Kew (7)	2024	Retrospective case series	17	5 (29.4%)	6	0 (0%)	42	10 (23.8%)
Saccomanno (8)	2024	Retrospective case series	-	-	-		16	1 (6.25%)
Bastard (9)	2023	Prospective cohort	-	-	37	2 (5.4%)	-	-
El Amiri (10)	2023	Retrospective case series	-	-	40	4 (10.0%)	-	-
Lo (11)	2023	Retrospective case series	-	-	-	-	38	4 (10.5%)
Stauffer (12)	2023	Retrospective case series	-	-	-	-	32	0 (0%)
TOTAL			**101**	**34 (33.7%)**	**634**	**57 (9.0%)**	**828**	**113 (13.6%)**

Within the literature search that was performed, no studies directly compared removal or retention of well-fixed and loose glenoid implants in subacute or chronic shoulder PJI. Our results are therefore limited to those studies which report outcomes of removal or retention of glenoid implants more broadly in shoulder PJI. Based on the available data from the most recent meta-analyses in combination with more recently published studies, a higher treatment failure rate was observed when components are retained (33.7%), compared to when components are exchanged in a one-stage or two stage revision procedure (9.0% and 13.6% respectively). Further limitations include most studies reporting data from retrospective case review, and the potential existence of confounding factors such as differing clinical presentations, causative organisms, patient morbidity, and surgeon preference, which may have all influenced whether implants were retained or exchanged.

Table 3: Summary of key findings

Outcome	**Number of participants (studies)**	**Quality of Evidence**	**Anticipated effects**		
			Risk with irrigation & debridement	Risk with 1 stage revision	Risk with 2 stage revision
Failure of treatment (i.e. failure to resolve infection)	1563 participants (2 systematic reviews + 9 additional studies)	++OO Low	33.7% (34/101 participants)	9.0% (57/634 participants)	13.6% (113/828 participants)

References:

1. Namdari S. https://icmphilly.com/questions/should-well-fixed-glenoid-components-be-removed-during-surgical-treatment-for-subacute-or-chronic-shoulder-periprosthetic-joint-infection-pji/. Should well-fixed glenoid components be removed during surgical treatment for subacute or chronic shoulder periprosthetic joint infection (PJI)?

2. Mercurio M, Castioni D, Iannò B, Gasparini G, Galasso O. Outcomes of revision surgery after periprosthetic shoulder infection: a systematic review. Vol. 28, Journal of Shoulder and Elbow Surgery. Mosby Inc.; 2019. p. 1193–203.
3. Bdeir M, Lerchl A, Hetjens S, Schilder A, Gravius S, Baumgärtner T, et al. One- vs. Two-Stage Revision for Periprosthetic Shoulder Infections: A Systematic Review and Meta-Analysis. Antibiotics (Basel). 2024 May;13.
4. Yerke Hansen P, Fomunung C, Lavin A, Daji A, Jackson GR, Sabesan VJ. Outcomes following revision reverse shoulder arthroplasty for infection. J Shoulder Elbow Surg. 2024 Nov;
5. Hollier-Larousse B, Hardy A, El Sayed F, Roux AL, Ménigaux C, Bauer T, et al. Single-stage revision for total shoulder arthroplasty infection. Results at a minimum 2 years follow-up. Orthopaedics and Traumatology: Surgery and Research. 2024 Sep;110.
6. Givens J, Schmidt CM, Patel R, Kucharik M, Grayson W, Chase C, et al. Factors affecting risk of recurrence with periprosthetic infection in shoulder arthroplasty. J Shoulder Elbow Surg. 2024 Jun;33:S80–5.
7. Kew ME, Mathew JI, Wimberly AC, Fu MC, Taylor SA, Blaine TA, et al. Outcomes after débridement, antibiotics, and implant retention for prosthetic joint infection in shoulder arthroplasty. J Shoulder Elbow Surg. 2024 Feb;33:e68–78.
8. Saccomanno MF, Lädermann A, Collin P. Two-Stage Exchange Arthroplasty for Periprosthetic Reverse Shoulder Arthroplasty Infection Provides Comparable Functional Outcomes to Primary Reverse Shoulder Arthroplasty. J Clin Med. 2024 Feb;13.
9. Bastard C, Aïm F, Meyssonnier V, Kerroumi Y, Marion B, Zeller V, et al. One-stage revision for infected shoulder arthroplasty: prospective, observational study of 37 patients. JSES Int. 2023 Nov;7:2433–9.
10. El Amiri L, Clavert P, Gaudias J, Klein S, Rondé Oustau C, Antoni M. High infection control rate after systematic one-stage procedure for shoulder arthroplasty chronic infection. Int Orthop. 2023 Nov;47:2809–26.
11. Lo EY, Ouseph A, Badejo M, Lund J, Bettacchi C, Garofalo R, et al. Success of staged revision reverse total shoulder arthroplasty in eradication of periprosthetic joint infection. J Shoulder Elbow Surg. 2023 Mar;32:625–35.
12. Stauffer TP, Goltz DE, Wickman JR, Rodriguez K, Levin JM, Lassiter TE, et al. Two-stage revision for periprosthetic infection in shoulder arthroplasty: an institutional experience. Seminars in Arthroplasty JSES. 2023 Mar;33:116–22.