

ISSUE 01

ShARC BITE

SCREW vs POST in REVERSE TSA

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Mission Statement

The Shoulder Arthroplasty Research Committee (ShARC) is a forward-looking global collaboration among research-focused surgeons of which the primary goal is to advance patient care. The ShARC Patient Registry is utilized to conduct patient monitoring, inform evidence-based implant design, and allow for the integration of novel technologies into clinical practice. Supported by Arthrex, the ShARC will continue to have tremendous influence on the advancement of shoulder arthroplasty through innovative research and a commitment to improve patient outcomes.

ShARC Bites are developed through registry data analysis and processing of the committee's preferences, cross-referenced with available ShARC and non-ShARC publications, to provide recommendations on current techniques and implants.

Summary Recommendation

The ShARC does not have a consensus for the use of a central screw or post fixation with nonaugmented baseplates in reverse total shoulder arthroplasty. Both can provide stable fixation with excellent clinical outcomes and can therefore be chosen based on surgeon preference. To maximize baseplate stability, regardless of central fixation method used, the ShARC recommends increasing length with bicortical placement when possible in addition to using 3 to 4 peripheral screws.

Construct Comparison



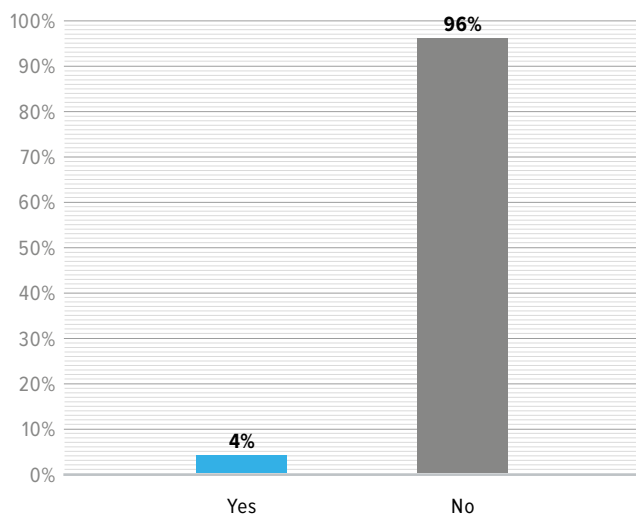
Background

Biomechanical analysis has shown that both central screw and post configurations provide adequate fixation with no significant difference in micromotion.¹ Similarly, clinical and radiographic outcomes at short-term follow-up are equivalent.² Regardless of the central fixation method used, important considerations when performing reverse total shoulder arthroplasty (RTSA) include the length of central fixation, length of peripheral fixation, and type of peripheral fixation, which have all been shown to affect baseplate stability.¹⁻⁷ We conducted a ShARC surgeon survey to identify their fixation preferences and below are the results.⁸

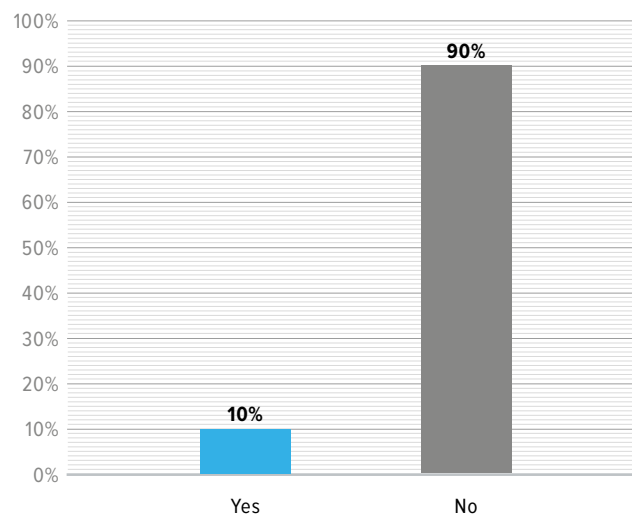
Central Screw vs Post Usage

When no significant glenoid deformity is present, **54% of ShARC surgeons prefer a central post, while 46% prefer a central screw**. Lateralizing the center of rotation does not affect the majority of surgeons' preference for central fixation.

Does Lateralizing +2 mm Change Central Fixation Preference?



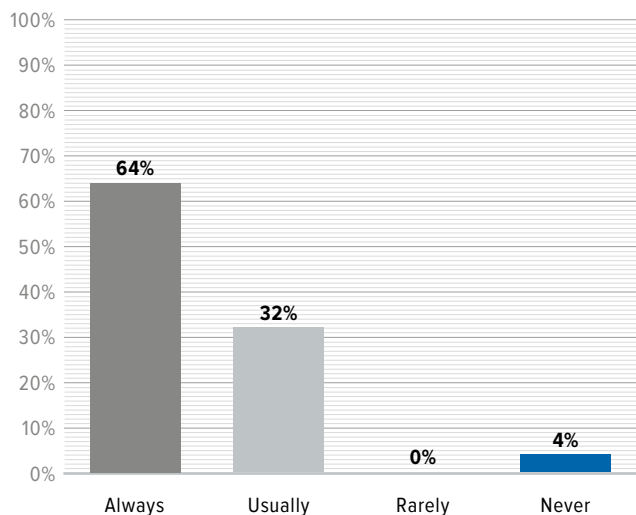
Does Lateralizing +4 mm Change Central Fixation Preference?



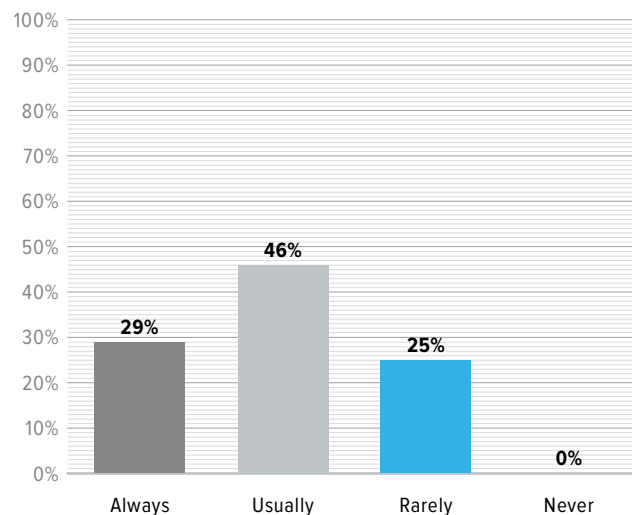
Central Fixation Length

Whether using a post or screw, **the majority of ShARC surgeons aim for bicortical fixation**. With central screw fixation, 96% of surgeons always or usually go bicortical. When using a central post, 75% of surgeons always or usually go bicortical.

Bicortical Central Screw Placement



Bicortical Central Post Placement



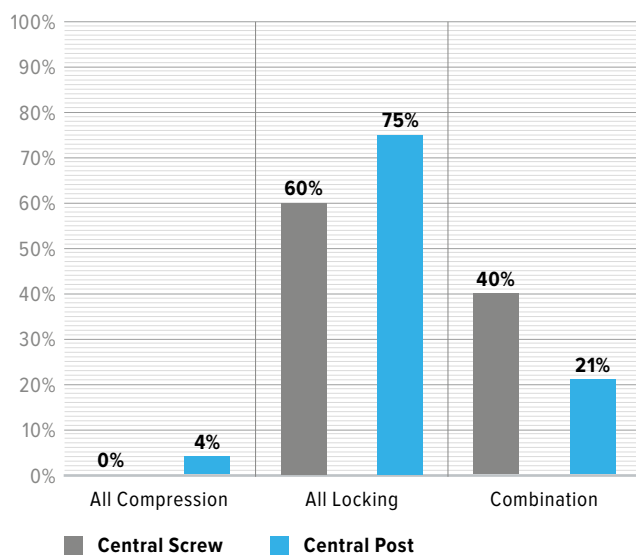
Bicortical fixation preference increases to greater than 90% with increasing lateralization off the baseplate. This is consistent with literature suggesting that longer central screw or post length and bicortical fixation increases baseplate stability.^{1,3,4}

Peripheral Screw Usage

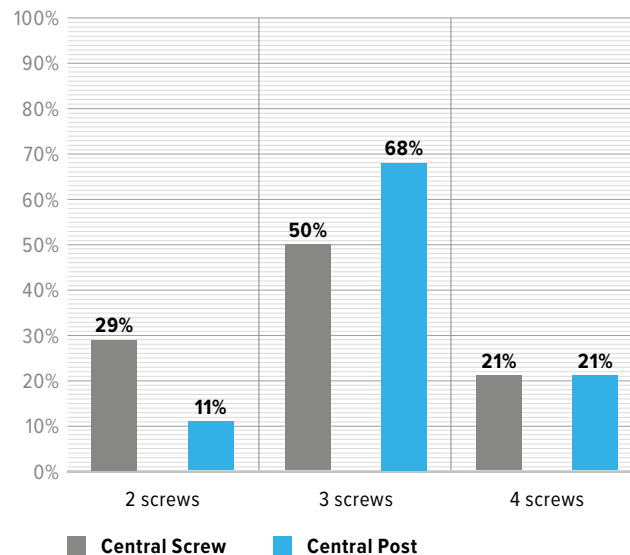
Regardless of central fixation method used, ShARC surgeons routinely use either a combination of compression and locking screws or all locking screws for peripheral fixation. Whether using a central screw or post, the majority prefer to use all locking screws. The use of at least one peripheral locking screw is preferred. Using a combination of compression and locking screws provides stable baseplate fixation; however, increasing the number of locking screws decreases micromotion and increases consistency.⁵

All ShARC surgeons routinely use a minimum of 2 peripheral screws for added stability. The majority routinely prefer 4 peripheral screws when sufficient bone stock allows, but more often use 3 screws 50%-68% of the time depending on the central fixation. Stable fixation has been reported with the use of 2 screws, but most studies have reported on medialized designs.^{6,7}

Peripheral Screw Usage



Number of Peripheral Screws



References

1. Bonneville N, Geais L, Müller JH; Shoulder Friends Institute, Berhouet J. Effect of RSA glenoid baseplate central fixation on micromotion and bone stress. *JSES Int*. 2020;4(4):979-986. doi:10.1016/j.jseint.2020.07.004
2. Bercik MJ, Werner BC, Sears BW, Gobezie R, Lederman E, Denard PJ. A comparison of central screw versus post for glenoid baseplate fixation in reverse shoulder arthroplasty using a lateralized glenoid design. *J Clin Med*. 2022;11(13):3763. doi:10.3390/jcm11133763
3. Lung TS, Cruickshank D, Grant HJ, Rainbow MJ, Bryant TJ, Bicknell RT. Factors contributing to glenoid baseplate micromotion in reverse shoulder arthroplasty: a biomechanical study. *J Shoulder Elbow Surg*. 2019;28(4):648-653. doi:10.1016/j.jse.2018.09.012
4. Königshausen M, Jettkant B, Sverdlava N, et al. Influence of different peg length in glenoid bone loss: a biomechanical analysis regarding primary stability of the glenoid baseplate in reverse shoulder arthroplasty. *Technol Health Care*. 2015;23(6):855-869. doi:10.3233/THC-151031
5. Formaini NT, Everding NG, Levy JC, Santoni BG, Nayak AN, Wilson C. Glenoid baseplate fixation using hybrid configurations of locked and unlocked peripheral screws. *J Orthop Traumatol*. 2017;18(3):221-228. doi:10.1007/s10195-016-0438-3
6. James J, Allison MA, Werner FW, et al. Reverse shoulder arthroplasty glenoid fixation: is there a benefit in using four instead of two screws? *J Shoulder Elbow Surg*. 2013;22(8):1030-1036. doi:10.1016/j.jse.2012.11.006
7. Roche C, DiGeorgio C, Yegres J, et al. Impact of screw length and screw quantity on reverse total shoulder arthroplasty glenoid fixation for 2 different sizes of glenoid baseplates. *JSES Open Access*. 2019;3(4):296-303. doi:10.1016/j.jses.2019.08.006
8. Arthrex, Inc. ShARC Consensus Statement Survey. Naples, FL; October 2023.



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