

ISSUE 06

ShARC BITE

BASEPLATE BACKSIDE CONTACT IN REVERSE TSA

RELEASED JANUARY 2025



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

Overall, the ShARC group recommends at least 75% backside contact for the baseplate in reverse total shoulder arthroplasty regardless of central screw or central post fixation. With decreased backside contact, the number of peripheral screws used should increase to improve stability. If 4 mm or more of glenoid bone reaming is needed to achieve backside seating, ShARC surgeons prefer to use an augment to maximize backside contact while preserving glenoid bone stock.

Background

The Modular Glenoid System offers a large portfolio of baseplate options to accommodate various types of glenoid deformities. There are two diameters offered for standard baseplates in addition to 10° or 20° full-wedge augmented baseplates and 15°, 25°, or 35° half-wedge augmented baseplates, all with options for lateralization. These options allow for optimal backside contact and glenoid bone preservation. The system also has the option for central screw or central post fixation for nonaugmented baseplates and a central post fixation for augmented baseplates.

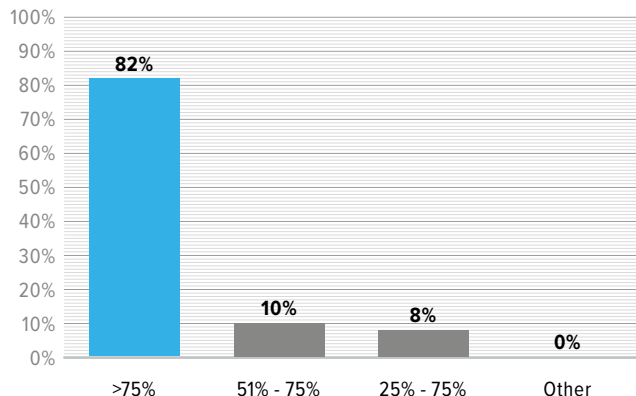
Data

Biomechanical studies have shown that baseplate contact less than 50% compromises the stability of the baseplate as it exceeds the 150- μ m micromotion threshold for bone ingrowth.^{1,2} Metal augmentation can be used in place of bone graft for glenoid reconstruction with good and comparable short-term outcomes.^{3,4} Peripheral screw orientation in the baseplate has not been shown to make a difference in baseplate stability, but longer screws and potentially a higher number of screws have been shown to have stronger initial baseplate fixation.^{5,6}

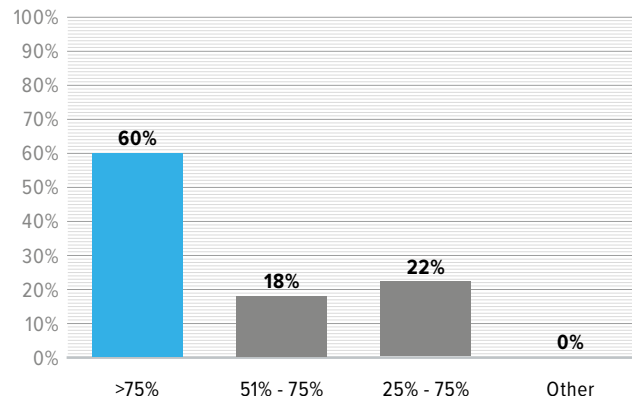
ShARC Survey Data

Most ShARC members prefer to achieve greater than 75% backside contact regardless of using central post or central screw fixation.

Percentage of Backside Contact With Central Post



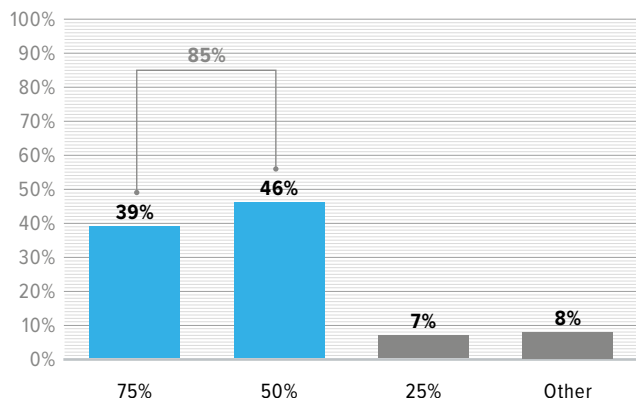
Percentage of Backside Contact With Central Screw



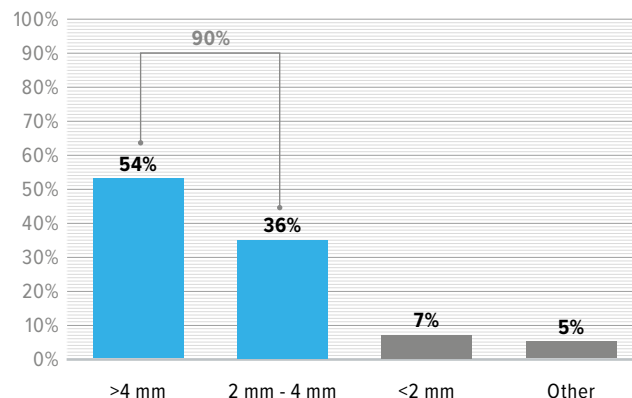
If the backside contact is between 50%-75% with a nonaugmented baseplate, the majority (85%) of ShARC surgeons will use an augmented baseplate to achieve better contact before reverting to a custom-made baseplate.

If 2 to 4 mm of bone needs to be reamed to achieve the desired backside contact, 36% of ShARC surgeons are changing to an augmented component to preserve glenoid bone stock. If the amount of bone to be reamed is greater than 4 mm, an additional 54% of ShARC surgeons are using an augmented component. This equates to 90% of ShARC surgeons using an augment if more than 4 mm of reaming is needed on the glenoid.

Backside Contact Percentage for Conversion to Augmented Baseplate

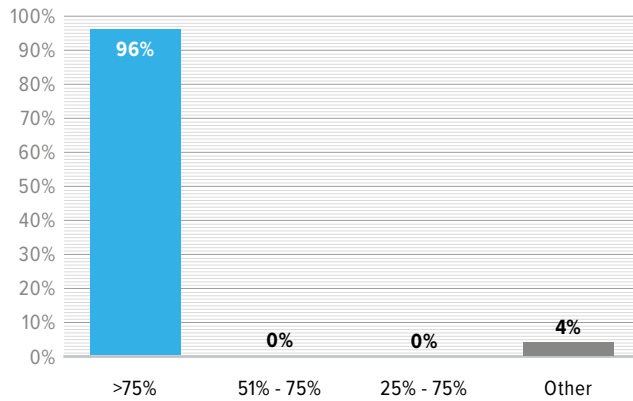


Ream Depth for Conversion to Augmented Baseplate



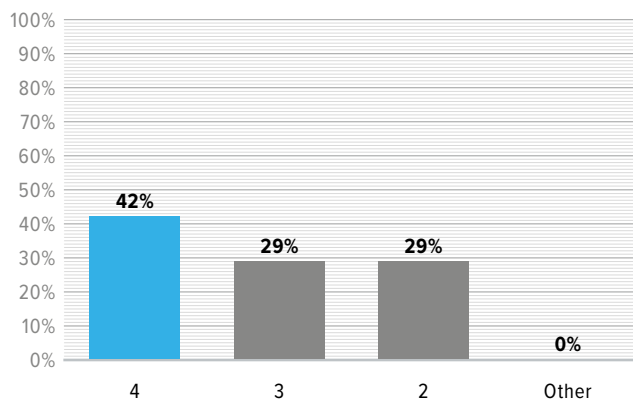
When using an augmented baseplate, nearly all (96%) ShARC surgeons want over 75% backside contact.

Desired Backside Contact Percentage When Using an Augment

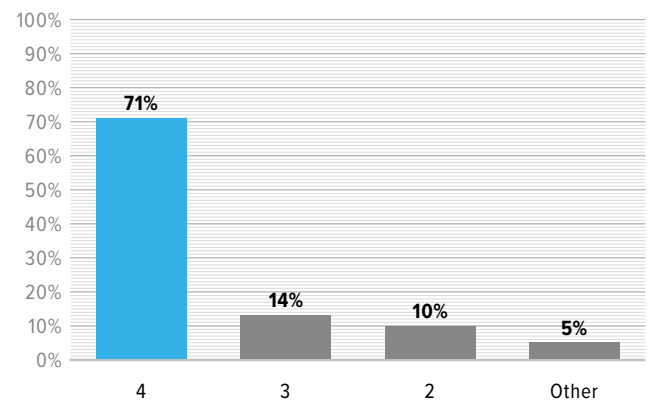


For ShARC surgeons, the number of peripheral screws used increases if there is less than 75% backside contact.

Peripheral Screw Usage When Good Backside Contact



Peripheral Screw Usage When <75% Backside Contact



References

- Martin EJ, Duquin TR, Ehrensberger MT. Reverse total shoulder glenoid baseplate stability with superior glenoid bone loss. *J Shoulder Elbow Surg.* 2017;26(10):1748-1755. doi:10.1016/j.jse.2017.04.020
- Formaini NT, Everding NG, Levy JC, et al. The effect of glenoid bone loss on reverse shoulder arthroplasty baseplate fixation. *J Shoulder Elbow Surg.* 2015;24(11):e312-e319. doi:10.1016/j.jse.2015.05.045
- Jasty M, Bragdon C, Burke D, O'Connor D, Lowenstein J, Harris WH. In vivo skeletal responses to porous-surfaced implants subjected to small induced motions. *J Bone Joint Surg Am.* 1997;79(5):707-714. doi:10.2106/00004623-199705000-00010
- Van de Kleut ML, Yuan X, Teeter MG, Athwal GS. Bony increased-offset reverse shoulder arthroplasty vs. metal augments in reverse shoulder arthroplasty vs metal augments in reverse shoulder arthroplasty: a prospective, randomized clinical trial with 2-year follow up. *J Shoulder Elbow Surg.* 2022;31(3):591-600. doi:10.1016/j.jse.2021.11.007
- Abdic S, Lockhart J, Alnusif N, Johnson JA, Athwal GS. Glenoid baseplate screw fixation in reverse shoulder arthroplasty: does locking screw position and orientation matter?. *J Shoulder Elbow Surg.* 2021;30(5):1207-1213. doi:10.1016/j.jse.2020.08.009
- 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



View the ShARC
Publication List

ShARC
Shoulder Arthroplasty Research Committee

