ISSUE 10

SHARC BITE

GLENOID INCLINATION IN REVERSE TSA

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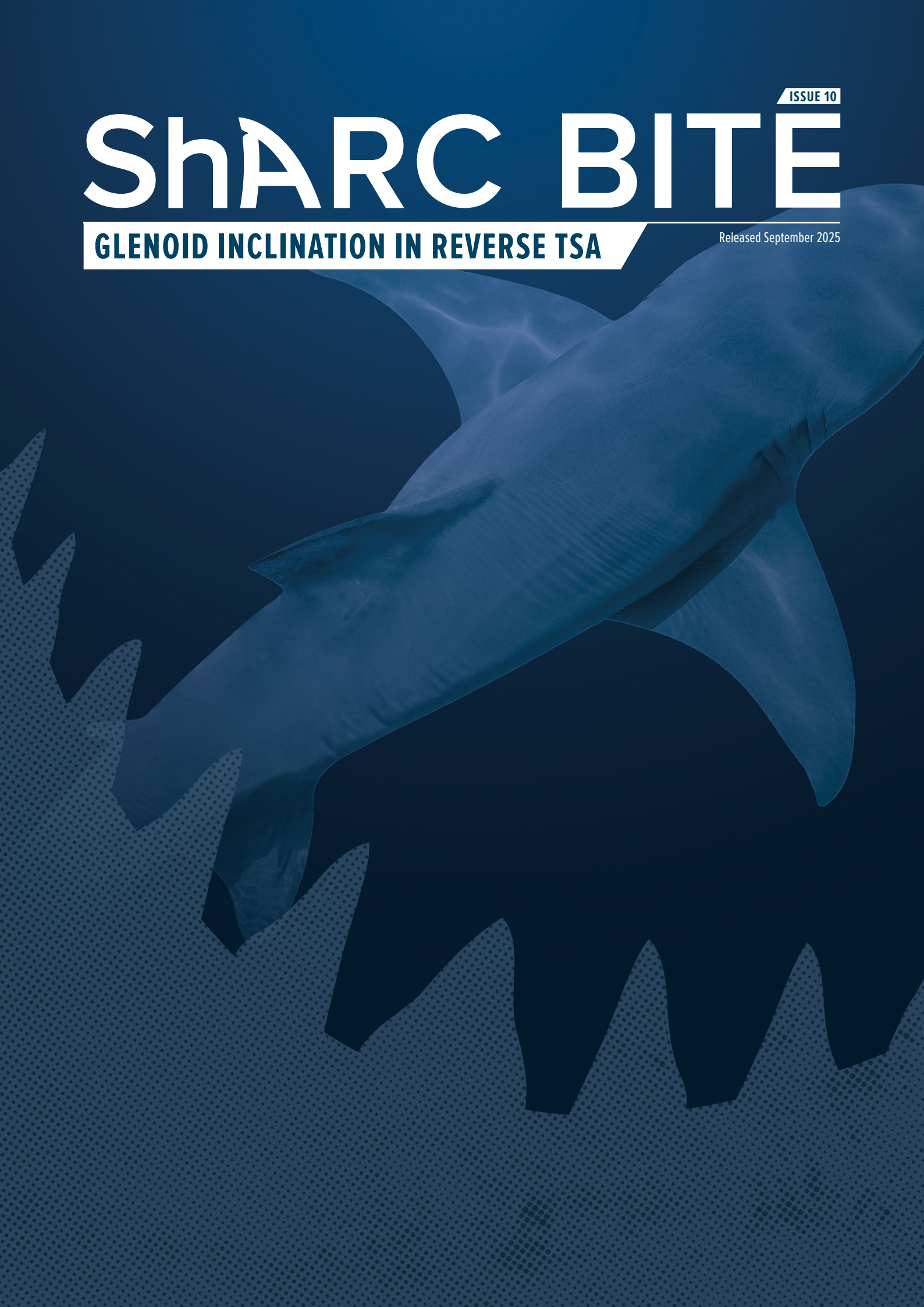


Mission Statement

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

Most ShARC surgeons (70%) have an absolute goal of 0˚ baseplate inclination in reverse total shoulder arthroplasty (rTSA), regardless of preoperative deformity. Surgeons are nearly evenly split on their view of the importance of inclination as measured by the scapular trigonum relative to the glenoid versus the RSA angle. Most surgeons prefer to ream less than 5 mm (85%) and limit corrective reaming to 15˚ or less (75%) to achieve this goal. Ninety-five percent of ShARC surgeons use an augment alone or a combination of corrective reaming and metal augmentation to achieve the desired inclination.

Background

Excessive baseplate superior tilt in rTSA has been associated with notching, instability, loosening, and variable functional outcomes. Computer simulation, finite element analysis, cadaveric studies, and clinical outcomes have provided some direction, but differences in implant design make it difficult to provide generalized recommendations for all patients.

Finite element analyses have shown that superior tilt causes the most uneven distribution of forces at the baseplate–bone interface during glenohumeral abduction. Inferior tilt produced the most even distribution of forces, but this was dependent on glenosphere design.[1] Cadaveric studies have shown similar stress findings, with superior inclination greatly increasing superior–inferior shear stress and decreasing glenohumeral contact forces, thus risking both baseplate loosening and instability. These forces were corrected with inferior inclination.[2]

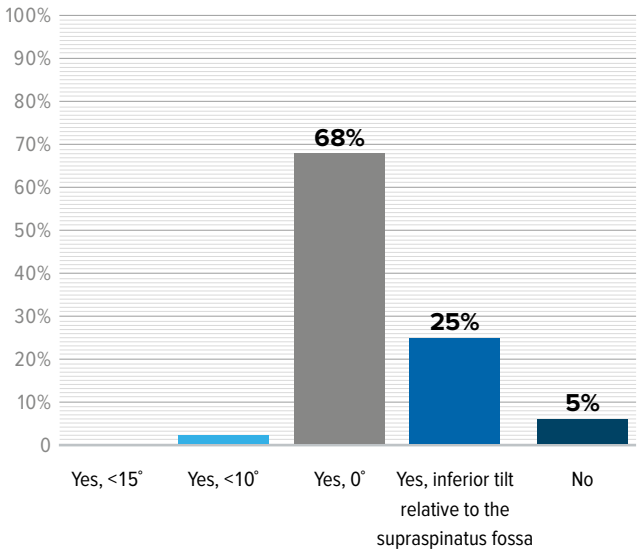
Superior inclination has also been associated with instability. In a cadaveric study, superior inclination was associated with a decreased anteriorly directed force to cause dislocation.[3] This association has also been demonstrated in clinical outcome studies, where increased instability and decreased ASES were observed with increased superior tilt.[4]

Scapular notching has also been associated with baseplate inclination, although the data span multiple implant designs and are influenced by superior–inferior baseplate position and glenoid implant lateralization. Some biomechanical and cadaveric studies have found that inferior tilt increases impingement-free range of motion, thus decreasing the risk of notching.[5,6] Conversely, other studies have shown that inclination has no effect or increases the risk of notching, with increased impingement risk in external rotation and adduction.[7,8] Clinical studies have failed to show a strong correlation with baseplate inclination and notching in the absence of instablity.[9,10]

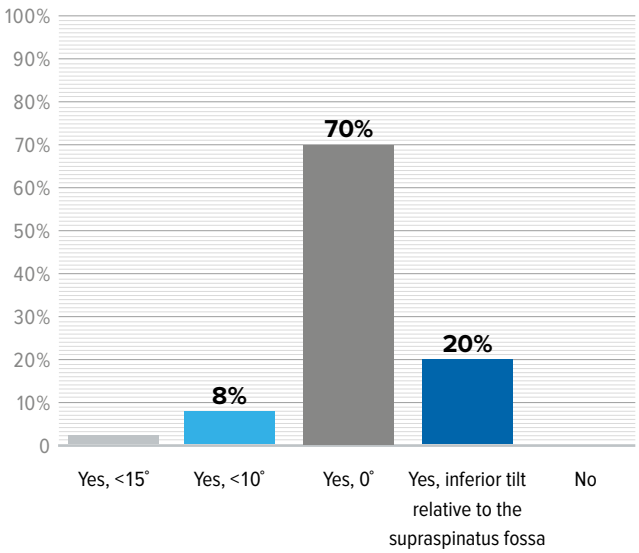
ShARC Survey Results

Forty high-volume shoulder arthroplasty surgeons were surveyed regarding their goal and preference for baseplate inclination in rTSA. In the absence of superior glenoid deformity, 68% of ShARC surgeons reported an absolute goal for inclination of 0˚. An additional 25% aimed for inferior tilt relative to the supraspinatus fossa or anatomic inclination. In the setting of superior glenoid deformity, the responses were 70% and 20%, respectively. Surgeons are nearly evenly split on their view of the importance of inclination as measured by the scapular trigonum relative to the glenoid versus the RSA angle, showing that both are important considerations in avoiding superior baseplate tilt.

In the absence of deformity (ie, superior wear) do you have an absolute goal for inclination in rTSA?

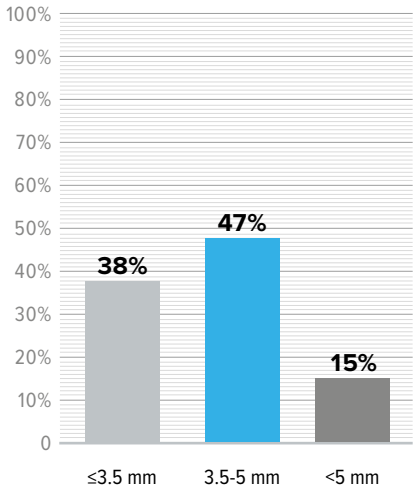


In the setting of superior glenoid deformity, do you have an absolute goal for inclination in rTSA?

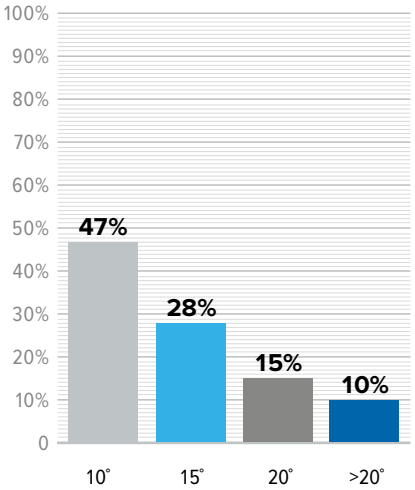


In order to achieve baseplate inclination goals, 85% of surgeons prefer to limit reaming to 5 mm or less, and 75% limiting corrective reaming to 15˚ or less, demonstrating a preference for bone stock preservation. The goal of bone preservation is also highlighted by the fact that 95% of surgeons use augments alone (15%) or a combination of augments and corrective reaming (80%) to achieve their desired inclination.

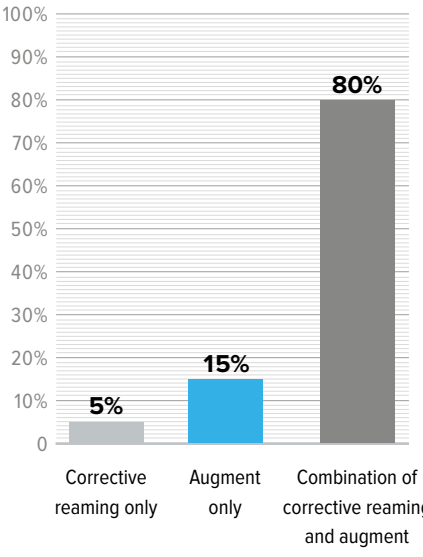
What is the maximum depth of ream for corrective reaming for inclination you would accept?



What is your limit for corrective reaming for inclination in degrees?



What is your preference for correcting inclination in rTSA?



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