

# **A Comparison of Anatomic Total Shoulder Arthroplasty for Posteriorly Eccentric and Concentric Osteoarthritis at Minimum 5-year Follow-Up: Is it important to correct glenoid version?**

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## **INTRODUCTION:**

*Background:* In patients with glenohumeral osteoarthritis and posteriorly eccentric wear patterns, the early to mid-term results of anatomic total shoulder arthroplasty (TSA) using conservative glenoid reaming without version correction have been favorable at early follow-up. The objectives of this study were to utilize minimum 5-year clinical and radiographic outcomes to understand:

- 1) the revision rate for TSA using a conservative glenoid reaming and “version-accepting” technique
- 2) whether there are differences in clinical outcomes for TSA with and without posteriorly eccentric wear patterns and for retroverted and non-retroverted glenoid components
- 3) which pre-operative or technical factors were risk factors for glenoid component radiolucencies.

## **METHODS:**

*Methods:* Patients who underwent TSA with minimum 5-year follow-up were identified from prospectively-entered data from an institutional database. Pre-operative and post-operative radiographs were used to determine humeroglenoid alignment (HGA-AP; “centering”), humeroscapular alignment (HSA-AP) glenoid retroversion, Walch classification, Lazarus grades (for seating and peg lucencies) and glenoid central peg bone interdigitation. The outcome measures were the Simple Shoulder Test (SST), glenoid component radiolucencies, and the occurrence of complications or revisions.

## **RESULTS:**

*Results:* The study included 210 patients at a mean  $7.8 \pm 1.9$  years follow-up. There were 77 shoulders with Walch type A glenoids and 122 with Walch type B glenoids; 47% had posteriorly decentered humeral head, 51% had centered humeral heads and 2% had anteriorly decentered humeral heads.

1) Revision rate for a conservative glenoid reaming and “version accepting” approach to TSA: Two patients (1%) underwent open revisions during the 7.8 year average followup.

2) Correlation of clinical outcome with posteriorly eccentric wear and retroversion: The final SST, change in SST, and percentage of maximal improvement were not correlated with pre- or post-operative humeral head centering, humeroscapular alignment, Walch classification, or glenoid or component retroversion (**Figure 1**). In patients with Walch B1 and B2 glenoids (n=110), there were no differences in outcome measures between patients with post-operative retroversion of more than 15° compared to those with less than 15°. Overall, there was no association between posteriorly eccentric wear or residual retroversion with SST, complications, or revisions.

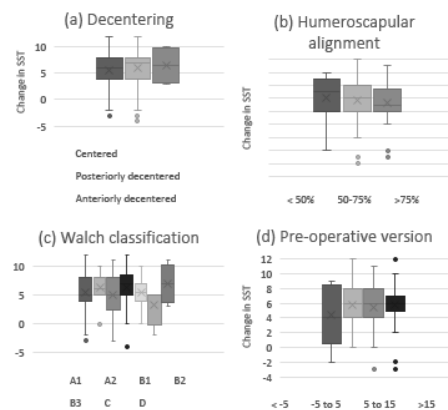
3) Risk factors for glenoid component radiolucencies: 15 of 51 patients (29%) with minimum 5-year radiographs had glenoid radiolucencies. These radiographic findings were not associated with inferior clinical outcomes. On multivariable analysis, glenoid component radiolucencies were most strongly associated with incomplete component seating (OR 3.3 [95% CI, 0.83 - 10.0],  $p = 0.082$ ).

## **DISCUSSION AND CONCLUSION:**

### *Discussion:*

- The results of TSA with conservative glenoid reaming without attempting version correction are favorable at minimum 5 year, mean 8-year follow-up.
- There were no differences in clinical and radiographic outcomes between patients with eccentric and concentric wear patterns, or those with more or less than 15 degrees of component retroversion.
- Incomplete glenoid component seating was the greatest predictor of glenoid component radiolucency, but glenoid component radiolucency was not associated with inferior clinical outcome.

**Figure 1:** Change in SST at minimum 5 years (mean 8 years) based on pre-operative decentering, humeroscapular alignment, Walch classification and version.



In 1(a), "centered" humeral heads were those with HGA -5 to 5%, "posteriorly de-centered" were those with HGA > 5%, and "anteriorly de-centered" were those with HGA < -5%. In 1(d), a positive value indicates retroversion and negative value anteversion. There were no statistically significant differences in change in SST across all groups.