

Ideal Placement Of Glenoid Baseplate Screws In Reverse Shoulder Arthroplasty

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INTRODUCTION:

Reverse shoulder arthroplasty (RSA) improves the outcome of patients with rotator cuff arthropathy(1, 2). Glenoid component loosening is a known complication and it is often due to technical errors and poor understanding of the complex glenoid morphology(3, 4). To date, only few studies done to find ideal glenoid baseplate placement and directions of screws, and glenoid component failure rate is still high. This study was to design a reproducible method and to identify the ideal placement and direction of each glenoid baseplate screws.

MATERIALS & METHODS:

25 glenoids were analysed with visualization software Mimics® Version 17.0 (Belgium) and reconstructed into 3-D images. Virtual glenoid baseplate based on The Aequalis® Reverse Shoulder Prosthesis II (Tornier, France) was created and incorporated into each glenoid 3-D model before the trajectories of the screws were created and measured using basic trigonometry.

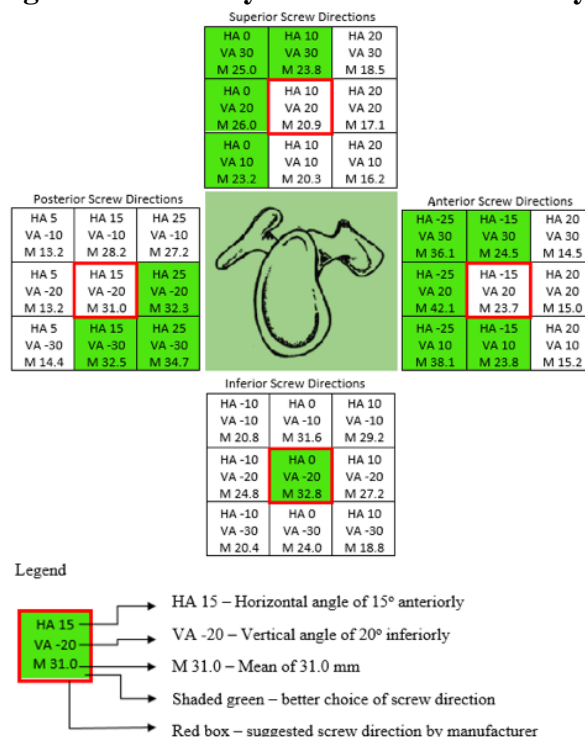
RESULTS:

Assuming bicortical screw purchase is stronger, the superior screw is best directed 20° superiorly while the inferior screw to be directed 20° inferiorly in relation to the glenoid baseplate peg. The anterior screw is best directed 20° superiorly and 25° posteriorly, while the posterior screw is best directed 30° inferiorly and 25° anteriorly (Figure 1).

DISCUSSIONS:

Our findings were different from the suggested screw directions by the manufacturer (Aequalis® Reverse Shoulder Prosthesis II, Tornier) and other references because our study is based on local population. None of the screws we concluded pierce the suprascapular notch of scapula.

Figure 1: Summary of the result of the study.



CONCLUSION:

This non-invasive study, is the first study that uses Mimic® to analyze the trajectory of screws objectively. The design and the 'standard' planes of glenoid can be easily reproduced for future mass study. It can serve as a guide to orthopaedic surgeon, hence, reducing the operative time and perhaps its complications in our local population.

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