Surgical treatment for the treatment of Instability following RSA

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Intro: Revision of an unstable RSA represents a significant challenge especially after failed previous shoulder arthroplasty. The purpose of this study was to determine 1) the outcomes of patients following revision reverse shoulder arthroplasty (RSA) in the setting of an unstable RSA and 2) the factors associated with achieving post-revision stability. The primary outcome measure was the status of glenohumeral stability at final follow-up.

Methods: A retrospective review of 59 revision RSAs for instability in 44 patients between 2004 and 2019 was performed. Thirteen cases were revisions for failed primary RSA and 31 patients were re-revisions of RSA; prior to re-revision, patients had: 26 RSA (4 had revisions related to proximal humeral bone loss, 1 failed proximal humeral replacement, 1 glenoid sided failure, 1 failed baseplate, and 19 due to instability), 1 failed TSA, and 4 failed hemi (3 infection and 1 fracture). Each case was categorized according to the 1) etiology of instability: loss of compression (23/44), loss of containment (5/44) impingement (14/44)) and component loosening (2/44), 2) type of instability: recurrent (23/44) or chronic (21/44), 3) number of unstable revisions: single (33/44), multiple (11/44) and finally 4) revision technique: glenoid component revision (1/59), humeral component revision (7/59), bipolar revision (51/59). The impact of each of these factors on final implant stability was then evaluated.

Results: At the final follow-up, only four patients (9%) remained unstable after revision surgery. Regarding the impact of previous surgery**,** 8% of patients (1/13) in the primary group and 10% in the revision group (3/31) remained unstable. As for the impact of etiology**,** recurrent instability was observed in patients with loss of compression (n=2) and impingement (n=2) (Table 1). Based on instability type, the instability rate at final follow-up was comparable between patients with recurrent instability (2/23) and those with chronic dislocation (2/21). Nighty-four percent (31/33) of patients who underwent a single revision for instability remained stable. These patients had an average of 4 previous surgeries including the revision. On the other hand, 82% (9/11) of patients requiring multiple revisions remained stable at final follow-up. These patients had an average of 6 previous surgeries including revision. Finally, with respect to revision technique, the revision that was performed on the glenoid component remained stable at final follow-up. Five out of 7 of the humeral component revisions (6 patients) also remained stable. Thirty-four out of the 37 patients with bipolar component revisions remained stable at final follow-up.

Conclusion: This clinical series reports on 31 patients who required re-revisions with recurrent instability and 13 primary reverses. Despite this, patients who present with recurrent instability predictably gain stability with upsizing of the glenosphere (both in diameter and lateral offset). Compared to patients who underwent a single revision surgery, patients with multiple revision surgeries have a higher instability rate at final follow-up. Loss of compression such as in the case of loss of deltoid tension and soft tissue impingement represents the most common causes for persistent instability. Ten percent of patients require multiple surgeries to gain stability.

Table 1: Etiology of instability in revision RSA

	Undersized components	Deltoid disfunction	Loss of Deltoid contour	Acromial fracture	Humeral shortening	Mechanical failure	Prosthetic malalignment	Soft tissue impingement	Bony impingement	Humeral loosening	TOTAL
Stable	13	3	3	1	1	4	2	4	7	2	40
Unstable	0	1	0	1	0	0	0	1	1	0	4
TOTAL	13	4	3	2	1	4	2	5	8	2	44