



Focal Humeroacromial Resurfacing in Patients with Massive Rotator Cuff Tears and Normal Glenohumeral Joints

HemiCAP® Contoured Articular Resurfacing

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Introduction:

- Rotator Cuff Arthropathy (RCA) (1) is a staged disease. Today, the early forms are seen more frequently due to improvements in medical imaging, frequency of shoulder arthroscopy, and higher patient demands that bring symptomatic shoulders into the orthopaedic practice earlier.
- Neer described RCA as:
 - Massive rotator cuff tear.
 - Superior migration and femoralization of the proximal humerus resulting in articular surface collapse.
 - Acetabularization of the acromion.
- A subset of patients with retracted, massive rotator cuff tears continue to have a glenohumeral joint within normal limits, however, the humero-acromial articulation is showing a focal painful defect (Figures 1a,b), along with acromial changes and frequent acromioclavicular degeneration.
- Surgical management at this stage has been limited and frequently involves the replacement of the intact glenohumeral joint with stemmed arthroplasty.

Indications for Humeroacromial Resurfacing

- Younger, higher demand patients
- Irreparable massive rotator cuff tear
- Localized defect on the superior humeral head
- Normal or restored glenohumeral joint
- Functional Subscapularis
- Compensated forward elevation ≥ 90 degrees

Advantages of Focal Humeroacromial Inlay Resurfacing:

- Intraoperative 3 D mapping and a variety of implant sizes and surface convexities allow for defect specific inlay resurfacing.
- No need to extract a stem for revision.
- Minimal bone and blood loss
- Reproducible surgical technique.
- Lower morbidity than hemi or total arthroplasty.
- Native anatomy is maintained.
- Virtually eliminates risk of periprosthetic fracture.
- Sound clinical exit strategy into hemi or total arthroplasty if necessary in the future.

Surgical Approach:

- Diagnostic arthroscopy
- Superior, deltoid splitting approach through the AC joint following distal clavicle resection.
- Preserves native subscapularis tendon and avoids related shoulder deficiencies.²
- Restores a smooth and continuous articular surface.

Concomitant Procedures to Address Secondary Pain Generators:

- Partial rotator cuff debridement
- Subacromial decompression leaving the CA ligament intact
- Distal clavicle resection to address AC joint DJD
- Biceps tenodesis only in severe tendinopathy
- Glenohumeral pathology repair



Figure 1a:
Focal, superior humeral head
arthrosis. Retracted, massive
rotator cuff tear.



Figure 1b:
Normal glenohumeral joint.

arthrosurface®



Figure 2:

Superior, deltoid splitting approach. Drill guide on defect.



Figure 3:

Preparation of inlay implant bed.



Figure 4:

Sizing trial confirming fit.



Figure 5:

Final HemiCAP® Focal Implant.

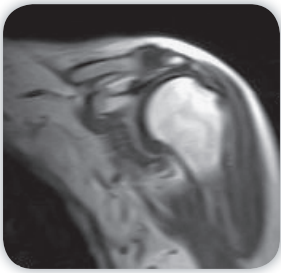


Figure 6:

Preoperative MRI.

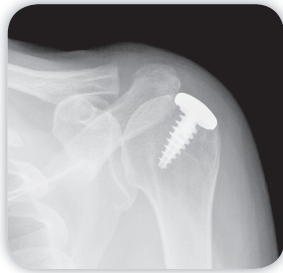
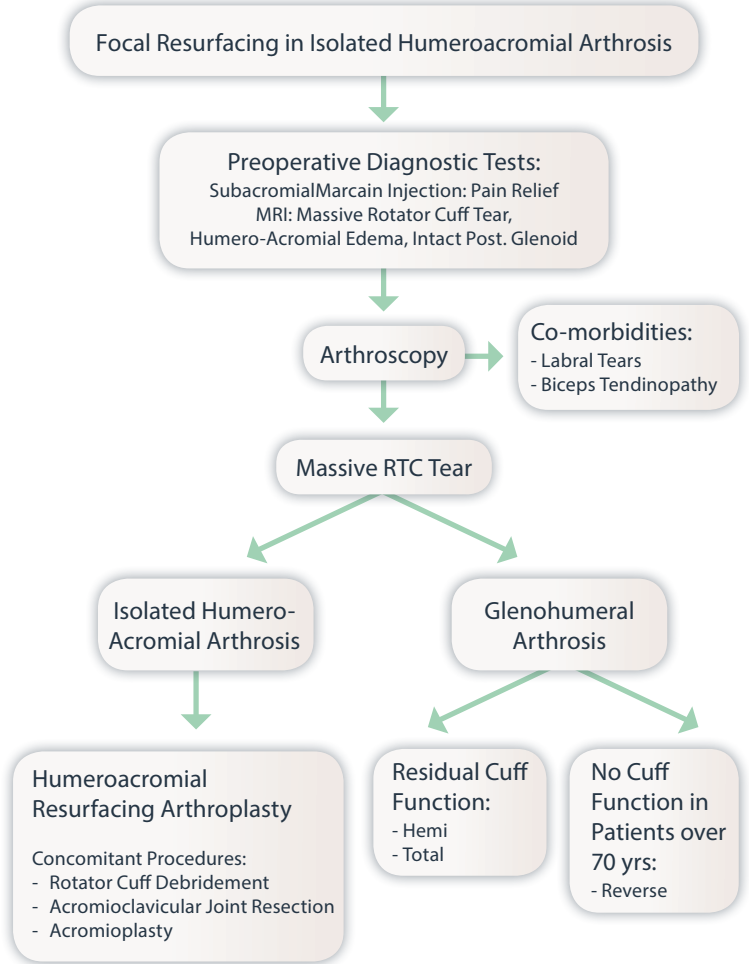


Figure 7:

Postoperative AP radiograph

Figure 8: Treatment Algorithm



Conclusion:

Superior humeral head resurfacing is an attractive alternative to hemi-, total-, or reverse shoulder arthroplasty in patients with isolated superior arthrosis and intact glenohumeral joints. Young et al. recently stated that salvage procedures for failed reverse shoulder arthroplasty are limited and until long term follow-up is available, its use should be restricted to elderly patients (3). For active, younger patients with residual cuff and deltoid function, pain relief can be effectively achieved through superior humeral head resurfacing, distal clavicle resection, subacromial decompression and proximal biceps tenodesis. Successful pain management permits a deltoid strengthening rehabilitation program that provides compensating functional improvements while maintaining all future treatment options. Focal resurfacing should be limited to isolated superior humeroacromial degeneration. Patients with concurrent advanced glenohumeral arthrosis should be treated with hemi or total arthroplasty procedures.

References:

1. Neer CS. 2nd, Craig EV, Fukuda H. Cuff tear arthropathy. JBS 1983; 65A:1232-1244.
2. Edwards TB, Williams MD, Labriola JE, Elkousy HA, Gartsman GM, O'Connor DP. Subscapularis Insufficiency and the Risk of Shoulder Dislocation after Reverse Shoulder Arthroplasty. JSES 2009, 18: 892-896.
3. Young SW, Zhu M, Walker CG, Poon PC. Comparison of functional outcomes of reverse shoulder arthroplasty with those of hemiarthroplasty in the treatment of cuff-tear arthropathy: a matched-pair analysis. J Bone Joint Surg Am. 2013 May 15;95(10):910-5.