

# Continuous Loop Double Endobutton Reconstruction for AC Joint Dislocation

Steven Struhl, MD<sup>1</sup>, Theodore Wolfson, MD<sup>1</sup>

<sup>1</sup> Department of Orthopaedic Surgery, NYU Hospital for Joint Diseases



## BACKGROUND

- Traumatic injury to the acromioclavicular (AC) joint is a common orthopaedic problem accounting for 9% of shoulder injuries.
- Without surgical intervention, the biomechanical and cosmetic consequences of the injury are permanent.
- This results in unsatisfactory outcomes in 20% of cases, at least 40% of patients report significant residual symptoms.
- Current anatomic methods for reconstruction of the dislocated AC joint show improved clinical results but are associated with significant rates of fixation loss and complications limiting more widespread use.

## MATERIALS AND METHODS

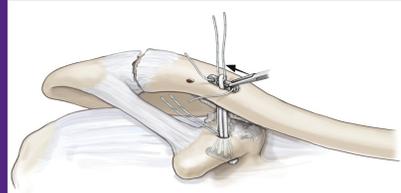
- Between 2003 and 2012, 35 patients (31 men, 4 women) at a mean age of 42 (range 25-70) were surgically treated for a Type III or greater AC joint dislocation.
- Imbrication of the AC joint capsule was done in all cases.
- The fixation construct was augmented with a coracoacromial ligament transfer in 28 cases and primary repair of the coracoclavicular ligament in 7 cases.
- All patients underwent primary AC joint reconstruction utilizing the double endobutton technique.
- Patients were placed in a sling for 6 weeks.
- All patients were included in follow-up at a minimum of 14 months to determine if revision or subsequent AC joint surgery was performed.

Patient demographic information, historical findings, and surgical details			
	All ACJR	Acute ACJR	Chronic ACJR
Number of patients (cases)	34 (35)	8 (8)	26 (27)
Age* (years)	43.7 (25 - 70)	48.3 (35 - 55)	42.3 (25 - 70)
Sex			
Male	30 (88%)	7 (88%)	24 (89%)
Female	4 (12%)	1 (12%)	3 (11%)
Injured side			
Right	19 (54%)	5 (63%)	14 (52%)
Left	16 (46%)	3 (37%)	13 (48%)
Interval to surgery* (days)	198 (4 - 1096)	13 (4 - 25)	257 (29 - 1096)
Rothwood grade			
III	19 (54%)	4 (50%)	15 (55%)
IV	2 (6%)	1 (13%)	1 (4%)
V	14 (40%)	3 (37%)	11 (41%)
Payer			
Private insurance	24 (69%)	7 (88%)	17 (63%)
No fault	8 (23%)	1 (12%)	7 (26%)
Worker's compensation	2 (6%)	0	2 (7%)
Lien	1 (3%)	0	1 (4%)

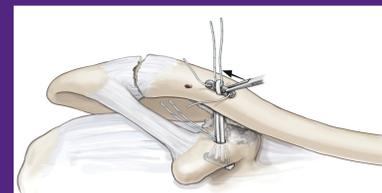
Absolute frequency (percentage) of cases. \*Value is the mean (range). ACJR, acromioclavicular joint reconstruction; BMI, body mass index.

## RESULTS

Illustration of the double endobutton AC joint reconstruction technique



The endobuttons are passed through the continuous suture loop that has been pulled up through the prepared holes in the coracoid and clavicle. The free sutures will be passed through the peripheral holes in the button to secure it.



Final appearance of construct with an auxiliary stitch replicating the course of the trapezoid ligament.

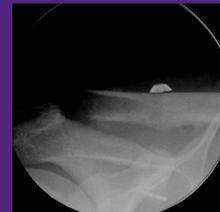
Fluoroscopic images demonstrating different variations of clavicular buttons used to achieve precise anatomic reduction.



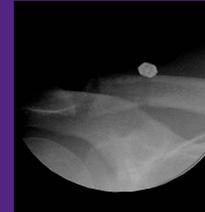
Single endobutton



Two stacked endobuttons



Single Xtendobutton

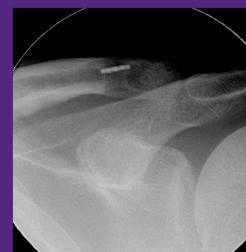


Two stacked Xtendobuttons

Fluoroscopic images demonstrating different clavicular button orientations at follow-up.



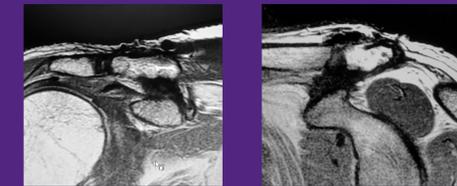
Single endobutton 2 years post operative



Single endobutton 2 years postoperative exhibiting interosseous migration into the clavicle.

## RESULTS

Coronal MRI images showing the CC interval at 2 years (lower left) and at 4 years (lower right) post-operatively. Note the increase in width and density of the soft tissue complex within the CC interval with time.



- At a mean follow-up of 4.3 years (range 1.3-11.0), the construct remained stable in all but one case.
- The mean CC interval difference was 1.1 mm (range, -2.5 to 4.0 mm) and less than 2 mm in 84% of cases.
- The mean Constant score was 98, UCLA score was 34, and ASES score was 98.
- Follow-up MRI evaluation in 9 patients consistently demonstrated a wide band of dense scar tissue between the coracoid and clavicle.

## CONCLUSIONS

- Excellent results were obtained and maintained over long-term follow-up.
- The continuous loop device eliminated the possibility of knot slippage or breakage.
- A comprehensive soft tissue repair, including imbrication of the AC capsule, prevented recurrent posterior instability.
- MRI imaging confirmed a robust healing response.
- Complications were avoided by using an open approach and minimizing the size and number of drill holes.
- The described technique resulted in outcomes that were significantly superior to nonsurgical treatment and can be recommended as first-line treatment for acute and chronic dislocations.