

Arthroscopic Suture Anchor Fixation Technique of Comminuted Displaced Greater Tuberosity Fracture

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Purpose

It is very difficult to achieve the anatomical reduction of comminuted, displaced greater tuberosity (GT) fractures in the proximal humerus. Cannulated screw fixation or tension band wiring of the GT fractures can lead to further comminution, migration and poor fixation of the fragments, especially in osteoporotic bone. Recent advances in arthroscopic techniques for the treatment of these fractures have produced promising results. The purpose of this retrospective study was to evaluate the mid-term results of arthroscopic treatment in patients with comminuted, displaced GT fractures using the double-row suture anchor fixation (ADSF) technique.

Materials and Methods

From 2004 August to 2007 December, we used the ADSF technique in sixteen cases of isolated comminuted, displaced GT fractures. The mid-term clinical results were evaluated in these patients at an average of 23 months (12-51) after surgery. There are 11 male and 5 female patients with the average age of 56.5 years (range, 27-82). These twelve cases had at least 5 mm of displacement of the fracture fragments in any plane. Patients with a minimally displaced fracture (<5 mm) or a severely displaced fracture (>20 mm) were excluded. For the measurements of the clinical outcomes, we measured ROM and evaluated Visual analogue scores (VAS), the University of California Los Angeles (UCLA) rating scale and the shoulder index of the American Shoulder and Elbow Surgeons (ASES).

Results

Using ADSF technique, we could get the good clinical results and foot print reconstruction of comminuted, displaced GT fractures, which was confirmed by arthroscopic findings of glenohumeral joint after fracture fixation. At the final follow up, visual analogue score (VAS) was improved to 1.2(range, 0 to 4 points), and the mean UCLA score was improved to 31 (range, 21-35) postoperatively and the ASES score improved to 88.1(range, 81.5-100). According to the UCLA shoulder score; there were 3 excellent results, 12 good results and 1 poor result. One poor results included one patients with shoulder fracture/dislocation combined with brachial plexus injury

(unhappy triad). The average forward flexion was 148.7 (120–170) degrees, the abduction 145 (120–170) degrees, the external rotation at neutral position: 24 (10–40) degrees and the internal rotation were improved to the first lumbar vertebra level (from L3 to T 7 level) in the last follow up.

Conclusions

The mid-term results of the ADSF technique used for displaced, comminuted GT fractures were encouraging and arthroscopist could try to expand the indication for arthroscopic treatment of these fracture.

Key Words: Comminuted greater tuberosity fracture, Arthroscopic double-row suture anchor fixation technique.

case	Sex	Age	F/U period (months)	D/L	Follow Up Results				Follow Up ROM*				Combined lesion
					VAS	ASES	UCLA	Radiologic assessment of adequacy of reduction(mm)**	FF	ABD	ER	IR	
1	M	69	25	Y	1	77	21	1.8	120	120	10	L3	Brachial plexus injury, Biceps tendon tear
2	M	77	24	Y	0	100	35	2.9	160	160	30	T7	Biceps tendontear
3	F	82	24	N	1	81.5	32	-3.4	140	140	30	L1	PASTA lesion†
4	F	74	28	N	1	91.5	33	1.2	160	160	20	T12	Biceps tear
5	M	43	22	N	4	71.5	28	-6.4	130	120	10	L2	No lesion
6	F	71	28	Y	2	81.5	31	-3.7	140	140	20	L1	Bankart lesion
7	M	51	42	Y	1	93.5	33	2.0	130	140	20	T10	Bankart lesion
8	M	33	51	N	0	100	35	1.2	170	170	40	T7	SLAP lesion††
9	M	39	20	Y	0	100	35	2.8	170	170	30	T7	Bankart lesion
10	M	27	13	Y	1	93.5	33	0	160	160	30	T8	Bankart lesion Capsular tear
11	M	65	18	Y	2	82	29	4.3	130	120	30	L1	Bony bankart
12	M	39	24	N	1	90	33	3.2	160	160	30	T 10	Biceps tendontear
13	F	67	12	N	2	83	31	1.8	140	140	15	L1	No lesion
14	M	53	15	N	1	91.5	33	1.2	130	140	20	T10	No lesion
15	M	47	14	N	1	82	31	1.2	160	130	30	T10	No lesion
16	F	67	12	N	1	92	29	2.1	140	130	20	L1	SLAP lesion††

* ROM: Range of motion, FF: forward flexion, ABD: abduction, ER: external rotation, IR : internal rotation.

** Radiologic assessment of adequacy of reduction (mm). (-) means that fragments was reduced into inferior displacement after GT reduction. † PASTA lesion: partial articular supraspinatus avulsion lesion. † SLAP lesion: Superior labrum anterior posterior lesion.