Research Paper

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Analysis of Clinical Outcome of Autogenousgraft technique in Grade-III Acromioclavicular Dislocations

Medical Science

KEYWORDS : acromioclavicular dislocation; autograft

R Bade Professor ,Department Of Orthopaedics ,R.C.S.M. GMC Kolhapur

O Saini Assistant Professor Department Of Orthopaedics ,R.C.S.M. GMC Kolhapur.

ABSTRACT

Objective: To evaluate clinical outcome of autogenousgraft technique in the surgical treatment of Rockwood Grade-III acromio-clavicular joint dislocation.

Methods: Fifteen patients were operated using using autograft technique. After a minimum follow up of one year, clinical assessment was done using Constant-Murley Score.Statistical evaluation was done using SPSS ver. 21.0.

Results: Mean age group was 31.4 4 ± 7.8 years. Average Constant shoulder score for autograft technique group was 91.7(Range 88 – 97).

Conclusion: Autograft technique was found to be superior in terms of functional outcome. Such superiority can be attributed to the biologic nature of coraco-clavicular ligament reconstruction in the autograft technique.

Introduction:

Injuries to Acromioclavicular joint are fairly common and constitutes 12% of all injuries to shoulder girdle(1).Acromioclavicular dislocation is classified as per criteria given by Rockwood et al(2).In Grade III dislocation,bothacromioclavicular and coracoclavicular ligaments are completely disrupted resulting in superior displacement of the distal clavicle. Many surgical treatments have been proposed to deal with such challenging injuries but still there is no gold standard procedure yet.

Furthermore,conservative approach to Grade III Acromioclavicular dislocations is considered appropriate by many authors(3). In this paper, we have done an analytical study of autogenousgraft technique in a fairly young study population suffering from grade III acromioclavicular dislocation.

Material and Methods

In our hospital, between May 2010 and February 2013, thirty patients who had Rockwood Grade III AC Dislocation were operated within two to ten days by the senior author. All the patents were operated under general anaesthesia in the beach chair position. Interscalene block was also given.

In these fifteen patients, tendonautograft in the form of semitendinosus was harvested from ipsilateral knee using a tendon stripper. After standard graft preparation, drill holes were made in the distal clavicle corresponding to anatomical attachment points of coracoclavicular ligament and the graft was then passed under the coracoid process in a figure of eight fashion. After reduction of the AC joint,the graft ends were secured using Ethibond No. 5.. Post-operatively, all patients were placed in an universal shoulder immobilizer for two weeks till suture removal.

Pendulum exercises were started at postoperativeday 15 and active range of motion was subsequently started. Strengthening protocol was begun after three months and patient were allowed to gradually return to their normal activities. Clinical assessment of recovery was made by an independent observer using Constant-Murleyscore.Such assessments were made after a mean follow up of 15.3 months ± 3.8 months postoperatively. In this study, there were 24 males and 6 females with a mean age of 31.4 ± 7.8 years.

Statistical Analysis was made using SPSS ver. 21.0 (Chicago,USA) and rejection of null hypothesis was done when p values were <0.05. Student *t*-test, descriptive statistics, and the Mann-Whitney *U*-test were employed to study outcome between the two treatment groups.

Observations and Results

Mean age of the entire study population was 31.4 ± 7.8 years. Average Constant shoulder the group was 91.7(Range 88 – 97).. There was one incidence of superficial infection in autogenousgraft technique group and a single incidence of deep infection .

Discussion:

Acromioclavicular joint is a diarthrodialjoint. Static stability is provided by coracoclavicular and acromioclavicularligaments; whereas trapezius and deltoid contribute to dynamic stability of this joint. Acromioclavicular joint injuries are classified most commonly using the 6 grade system described by Rockwood (2).Type I : Mild A.C. ligament sprain.Type II : Ruptured A.C. ligament with C.C. ligament sprain.Type III : Both C.C and A.C. ligaments are ruptured.Clavicle elevated above the superior border of the acromion but coracoclavicular distance is less than twice normal. Type IV: Clavicle displaced posteriorly into trapezius.Type V : clavicle is markedly elevated and coracoclavicular distance is more than double normal (i.e. >25 mm).Type VI : clavicle inferiorly displaced behindcoracobrachialis and biceps tendons.

As far as treatment of Acromio-clavicular dislocations is concerned, there is quite a bit of confusion with regards to treating a grade III injury. Despite our greater knowledge of tendon healing and incorporation; and vast improvement in our surgical techniques, we are yet to arrive at a 'Gold Standard'. Grade III injuries are usually treated conservatively and various authors have obtained satisfactory results with conservative line of management(4,5).On the other hand, several reports have supported operative management of such injuries in young population who are physically active(6,7).With regards to surgical options,variety of procedures have been described in the literature,viz tension band wiring, k-wire fixation, hookplate, autogenousgraft or allograft reconstruction of acromioclavicularjoint, Bosworth screw fixation, use of synthetic ligament,mersilene tape slingetc. The purpose of our study was to analyse clinical outcome of coracoclavicular ligament reconstruction using autograft in chronic grade III injury.This method of fixation has recently gained popularity particularly over the traditional methods such as tension band wiring ,k-wire fixation and clavicular hook plate fixation.

Tradional techniques had problems of metal breakage,pinmigr ation,neurovascularinjury,loss of reduction,implant failure etc. With use of hook plates,such problems are not there.Several studies have published promising results with usage of hook plates(8,9).However,this technique is not without complications. Subacromial impingement is often reported;acromial erosions or distal clavicle fracture may occur due to altered biomechanics(10,11).Loss of reduction may also occur although it is much

less common than traditional techniques. Second surgery for hardware removal is also advocated after complete healing.

Recent biomechanical studies have proved beyond doubt that reconstruction of acromioclavicular joint using tendon graft is more biological and the resultant repair tissue is desirable in terms of strength and kinematics(12).Most of the described reconstruction techniques deal only with coracoclavicular ligament but it has been shown that additional acromioclavicular ligament reconstruction adds to the final stability in a significant way(13,14,15).However, in our study we aimed to reconstruct coracoclavicular ligament only. As per our results, we observed a significant improvement in clinical outcome of graft reconstruction . Anatomic technique using semitendinosus graft showed superiority inoutcome over the non anatomic procedure .Similar results have been reproduced by various authors as well, in both clinical and cadaveric scenarios(16,17,18).This is in accordance with idea of anatomic reconstruction of damaged ligaments after they have been injured.

Various procedures around the knee now focus on defining isometric points and subsequent anatomic reconstruction.Our study has few limitations. The study population was relatively small. Minor modifications in surgical technique might have occurred with passage of time as reconstruction of coracoclavicular ligament was a demanding procedure and we were relatively new to this technique. Still we tried our best not to allow any major change in the operative technique so as to keep such a bias to minimum in our study.

Conclusion:

In conclusion, we obtained favourable results in autograft technique of reconstruction of coracoclavicular ligament. We attribute this to the biological nature of anatomic reconstruction of A.C. joint. Furthermore, this procedure doesn"t require another procedure for hardware removal .

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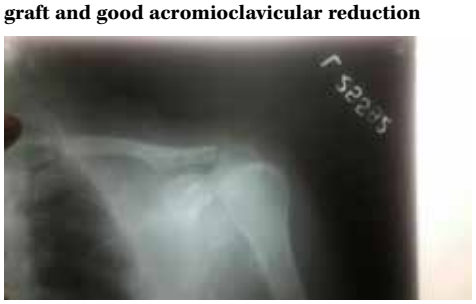
Photographs with title

1)Demonstration of technique of reconstruction of coracoclavicular ligament with semitendinousgraft.

2): Post-Op X-ray depicting clavicular drill holes for the graft and good acromioclavicular reduction



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