www.jmscr.igmpublication.org

Impact Factor 3.79
Index Copernicus Value: 5.88
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: http://dx.doi.org/10.18535/jmscr/v3i12.12

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Coracoclavicular (Polyester) Suture Reconstruction of acute Type III Acromioclavicular Joint Dislocation – Surgical Technique and Outcome

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Abstract
Introduction: *AC joint dislocation is among the common shoulder problems accounting for 9% of all shoulder injuries. AC joint injuries can be quite disabling especially in athletes and individuals who have to place heavy loads on their shoulder in their workplace. Controversy still exists for type III injury. we present our technique of reconstruction for acute type III AC joint dislocation with trans-osseous coracoclavicular figure of 8 suturing with non-absorbable (No.5) poly (ethylene terephthalate) suture material in twelve adult patients.*
Materials and methods: *Twelve adult patients in the age between 18 to 40 years presented to our institute and diagnosed to have type III AC joint dislocation were included in this study.*
Results: *All 12 patients had a type III injury and were followed up as per the protocol. At the final follow up the average ASES score was 95.8 with a range of 93.3 to 98.3 which suggests an excellent outcome. All patients were able to return to their pre injury level of activity. There was no infection, or other complications.*
Conclusion: *Our small series we had a good subjective, objective and radiological outcome with our technique of AC joint reconstruction using polyester sutures. It can be recommended as a fixation technique in young active males.*
Keywords: *AC joint dislocation, coracoclavicular ligaments, AC joint reconstruction.*

INTRODUCTION

Acromioclavicular (AC) joint a diarthrodial joint is one among the 5 joints complex in the shoulder girdle and forms an important link to suspend the upper limb on to the trunk very effectively. AC joint dislocation is among the common shoulder problems accounting for 9% of all shoulder injuries[1]. The direct impact to the shoulder girdle as seen with fall from bicycle/motorbikes or horse and contact sports like rugby, football, hockey are all commonly associated with AC joint disruption/dislocation to varying degrees requiring

treatment. AC joint injuries can be quite disabling especially in athletes and individuals who have to place heavy loads on their shoulder in their workplace. As per Rockwood's modern treatment, 6 types of disruptions/dislocations of AC joint can be seen. When you look at studies regarding the management of these injuries, most authors agree that Type IV to VI injuries need to be treated surgically, controversy still exists for type III injury. There are numerous surgical techniques available in the literature[2,3] each having variable results, we present our technique of reconstruction for acute type III AC joint dislocation with trans-osseous coracoclavicular figure of 8 suturing with non-absorbable (No.5) poly (ethylene terephthalate) suture material in twelve adult patients.

MATERIALS AND METHOD

Patients in the age group of 18 to 40 years who presented to us with complaints of pain and difficulty in using the upper limb following road traffic accident and diagnosed to have type III AC joint dislocation of less than one week duration were included in the study after obtaining informed consent. Patients with ipsilateral associated injuries around the shoulder girdle were excluded. Internal review board approval was obtained for the study. The period of study was from 2012 Jan - 2014 June with a minimum follow up of 1 year. All patients who were included underwent AC Joint reconstruction with our technique. Patients were regularly followed up at 1, 3, 6 and 12 months. During each visit functional outcome was assessed using American shoulder and elbow surgeon score (ASES) and the Quick DASH score.

SURGICAL TECHNIQUE

All patients were operated under general anaesthesia in supine position with sand bag support for the affected shoulder along the medial border of scapula. Curvilinear 5 to 6cm incision was made centering the AC joint extending 3cm on either side of the joint. Full thickness subcutaneous flaps are raised medially and laterally to expose the deltoid and trapezius aponeurosis, AC joint, and the lateral 2 to 3 cm of the distal clavicle. Subperiosteal dissection was carried out through delto-trapezius aponeurosis to expose the lateral 3 cm of clavicle and AC joint (Figure 2 A). If the AC ligament was found intact on the acromial attachment, it was left undisturbed. Using 3.2 mm drill bit two drill holes were made approximately 2.5 cm and 3.5 cm medial to lateral end of clavicle corresponding to the anatomical site of attachment of trapezoid and conoid ligaments respectively (figure 2 A, B).Medial drill hole was made at the junction of anterior two third and posterior one third and the lateral drill hole was made anterior one third and posterior two third junction of the breadth of the clavicle. After open reduction of the AC joint, no 5 polyester (PDS) suture was made into a 4 strand bundle was passed underneath the base of the coracoid process and then in through the two drill holes made in the clavicle at the relative footprint of conoid and trapezoid (Coracoclavicular) ligaments in a figure of 8 manner and tied over the clavicle (figure 1, 2C&D). AC joint reduction was checked under the image intensifier. Then acromioclavicular ligaments were sutured back to the lateral end of clavicle through two drill holes of 2mm size, using absorbable suture material. Stability of the AC joint was assessed using fluoroscopic images through passive range of motion at the shoulder joint.

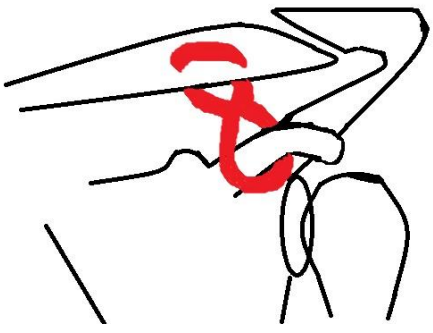

Figure 1 diagramatic representation of figure of 8 coracoclavicular reconstruction

Postoperatively shoulder was immobilized using an arm sling for 2 weeks and gentle range of movement (pendulum) exercises at shoulder was started from two weeks onwards, to gain full range of movements by the end of 6 to 8 weeks. After 8 weeks muscle-strengthening exercises were started.

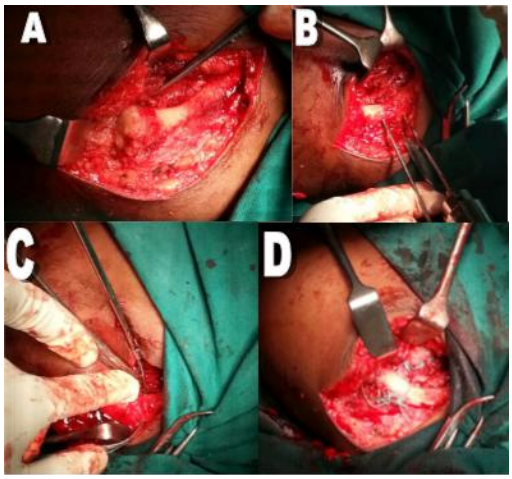

Figure 2 representing AC joint exposure (A), transosseous tunnel preparation (B), suture material passed through tunnel (C), AC joint reduced and fig of 8 suturingdone (D)

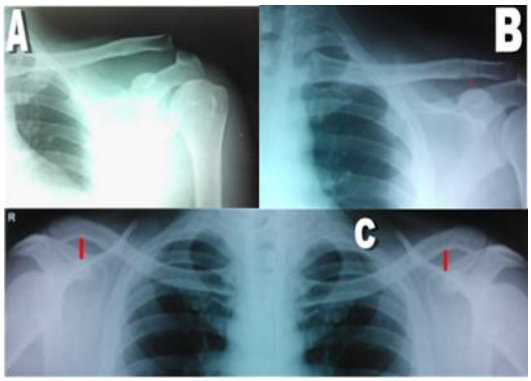

Figure 3 showing Type III AC joint dislocation(A), Postop x-ray showing AC joint reduction(B), 2 year follow up x-ray with equal Coracoclavicular distance on both sides-Red line(C)

RESULTS

A total of 12 adult patients all males, aged between 25 to 40 years underwent AC joint reconstruction using our technique at our institute. The average age of our patient's was 32 years. 10 patients had injury following Road traffic accident and 2 patients had injury following sports injury. All patients had type III injury. All patients were followed up as per the protocol. At the final follow up the average ASES score was 95.8 with a range of 93.3 to 98.3 which suggests an excellent outcome. As per Quick DASH score, all 12 of our patients had excellent results. All patients were able to return to their pre injury level of activity. There was no infection, or other complications. All patients had full painless range of movements at the final follow up at two years (figure 4). Radiological assessment done at the final follow up at two years revealed no evidence of loss of reduction, lateral end clavicle osteolysis, or arthritic changes of the AC joint (Figure 3 C).

Figure 4 clinical photo showing excellent outcome at 1 year follow up

DISCUSSION

Acromioclavicular joint injuries are common injuries but controversies regarding the management of these injuries still exist, especially when it comes to Rockwood and Greens type III dislocation. There is still no consensus whether to treat these patients non-operatively or operatively. In our study we had excellent results following operative treatment using our technique in all 12 patients. The average ASES score was 95.8 and all patients achieved a painless full range of motion.

Moustafa AM et al.[3] did a study where they evaluated the results of Acromioclavicular dislocation reconstructed and augmented with PDS Bands. 14 patients (60.9%) were completely free of pain, 3(13%) patients had occasional slight pain, 4 patients (17.4%) had mild pain during heavy work only, while the remaining 2 patients (8.7%) experienced pain following minor efforts. They used the UCLA score to assess outcome and

found that 87% of their patients had excellent or good results. 17(74%)of their patients were able to return to former professional activity. 12(100%) of our patients were able to return to their former professional activity. Using the ASES score we had an excellent outcome in all our patients.

Smith TO et al.[4] in their metaanalysis of non-operative vs operative treatment of Type III AC joint injuries found that, operative management of grade III acromioclavicular dislocations results in a better cosmetic outcome (P\ 0.0001) but a greater duration of sick leave (P\ 0.001) compared to non-operative management. There was no difference between the two interventions in terms of strength, pain and throwing ability (P \0.05). Although we didn't have a conservative arm we also had good results with operative treatment.

Sandmann et al.[5] did a study where they reconstructed the AC joint using a triple suture cerclage technique where 2 sutures were used for the AC joint and 1 for the CC joint. They had good to excellent result in all their patients with the average ASES score being 94.6. However the mean CC distance increased at final follow up, but this did not affect the final functional outcome.

Carli et al.[6] did a study in 72 patients with type III dislocation where 25 patients (group A) were treated conservatively, and 30(group B) patients treated surgically with the TightRope™ system. The mean ASES scores, 98.5 ± 1.6 in group A and 100 in group B, were not significantly different. The constant scores were also similar and not statistically significant. They concluded that although better subjective and radiographic results were seen in surgically treated patients, the objective scores did not show significant differences between the two groups, and they don't recommend routine use of surgery to treat patients with Type III AC joint Dislocation.

Korsten et al.[7] did a systematic review of literature of type III AC joint dislocation managed both conservatively and operative and found that the objective and subjective shoulder function outcome was better in the operative group, especially in young adults, though the rate of complications and radiographic abnormalities were higher. The rehabilitation time was shorter in the conservatively managed group, however they had a worse cosmetic outcome.

In the past few years all-arthroscopic techniques have been described and several studies have shown good to excellent clinical and radiological results. Although in these techniques the important deltoid-trapezoidal fascia is not addressed. All our patients were young active males with average age of only 32 years. This could be the reason why we had a good subjective, objective and radiological outcome after surgery. We did not have any complications, it could be because our group is small and also because we did not use any implants.

CONCLUSION

In our small series we had a good subjective, objective and radiological outcome with our technique of AC joint reconstruction using polyester sutures. It can be recommended as a fixation technique in young active males.

REFERENCES

1. Simovitch R, Sanders B, Ozbaydar M, Lavery K, Warner JJP. Acromioclavicular Joint Injuries: Diagnosis and Management. J Am Acad Orthop Surg 2009;17:207-219.
2. Boehm TD, Kirschner S, Fischer A, Gohlke F. The relation of the coracoclavicular ligament insertion to the acromioclavicular joint-A cadaver study of relevance to lateral clavicle resection. Acta Orthop Scand 2003; 74 (6): 718–721
3. Moustafa AM, Ragab RK, Shoukry FA. Surgical Repair of Complete Acromio-clavicular Dislocation Augmented with PDS Bands. Technique and Results. Pan Arab J. Orth. Trauma 2003 (7)1:21-31.
4. Smith TO, Chester R, Pearse EO, Hing CB. Operative versus non-operative management following Rockwood grade III acromioclavicular separation: a meta-

analysis of the current evidence base. J Orthopaed Traumatol (2011) 12:19–27.

5. Sandmann GH, Martetschläger F, Mey L et al. Reconstruction of displaced acromio-clavicularjoint dislocations using a triple suture-cerclage: description of a safe and efficientsurgical technique. Patient Safety in Surgery 2012, 6:25.
6. Carli AD, Lanzetti RM, Ciompi A, Lupariello DA, Rota P. Acromioclavicular third degree dislocation: surgical treatment in acute cases. Journal of Orthopaedic Surgery and Research (2015) 10:13
7. Korsten K, Gunning AC, Leenen LPH. Operative or conservative treatment in patients with Rockwood type III acromioclavicular dislocation: a systematic review and update of current literature. International Orthopaedics. 2014; 38:831–838