

Anatomical Reconstruction of Type 3 Acromio Clavicular Joint Dislocation in Adults Using Semitendinous Graft

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Abstract:Acromioclavicular injuries are very often missed and given less importance by patients. Here We have used a innovative technique for repairing acromioclavicular ligament both in acute and neglected acromioclavicular joint injuries. We studied a series of five cases in which we did acromio clavicular ligament reconstruction using semitendinous graft .out of the five cases one case was 3 months old neglected injury and others were acute injuries. We analysed the patients functional outcome by means of clinical improvement in shoulder range of motion, improvement in pain, radiological reduction acromio clavicular joint distance.

Key words:Ac joint injuries, STG graft,

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I. Introduction:

Acromioclavicular joint injuries account for 12% of all shoulder injuries even with under-reporting. Most AC joint injuries occur in the third decade of life and acromio-clavicular joint dislocations are commonly sustained as a result of participation in contact sports. The mechanism of injury is a direct blow to the shoulder with the arm in adduction or thrown from a two wheeler landing on shoulder. Due to the high strength of the sternoclavicular joint, it stops the migration of clavicle and hence the acromioclavicular joint disrupts. The treatment of type 3 injury is unsettled whereas lesser varieties can be treated conservatively and greater varieties require surgical intervention. The coraco-clavicular ligaments are responsible for vertical stability, horizontal stability is mainly attributed to the AC joint complex. Regular coraco clavicular fixation methods will give vertical stability. In this paper we present treatment of a case of type 3 acromioclavicular joint disruption with anatomical reconstruction of the AC ligaments using an autologous semitendinosus tendon graft.

Case illustration:

A 45 yrs old male patient a farmer came with pain over right shoulder for the past 3 months. Patient had difficulty in doing day to day activities. Patient had sustained injury over the right shoulder following an road traffic accident 3 months back. Patient had undergone native treatment. On examination abnormal prominence noted over the distal end of clavicle right side ,muscle wasting noted over right shoulder, abnormal mobility on pressing over the distal end of right clavicle range of movements of right shoulder present but abduction over 90 degree painful and restricted. Basic blood investigations, ECG, radiographs were taken and patient was assessed. Preoperative images [Fig.1 and 2] preoperative radiograph – Fig.3



Fig.1 Clinical image



Fig.2 Clinical image



Fig .3 Preoperative radiograph

Under general anaesthesia, in beach chair position at 60° flexion and as laterally as possible and right shoulder slightly elevated with padding underneath the medial border of scapula to improve access to clavicle and parts painted and draped. Graft harvesting site also prepared and draped as shown in Figure.4.



Fig.4 ,Patient in beach chair position with 60°flexion

Graft harvesting and preparation

A 3-cm oblique skin incision was performed over the pes anserinus. The soft tissues were dissected down to the sartorial fascia, and the semitendinosus was visualized. The fascia was then incised, and the semitendinosus was identified and bluntly dissected with a right-angle clamp. Blunt dissection was continued medially to define the interval between the superficial medial collateral ligament and the semitendinous tendon. The tendon was then sharply released from its insertion on the proximal tibia. Blunt dissection was done to separate the tendon from the fascia of the medial head of the gastrocnemius. The tendon was then released from its distal muscle-tendon junction by means of a tendon stripper and taken for preparation. The wound was closed in layers. The remnant muscle tissue is removed from the graft and prepared.Fig.[5-7]



Fig.5 Graft harvesting



fig.6 Harvested graft



fig.7 Graft preparation

Clavicular tunnels preparation

Skin incision of size 4-5cm placed over distal end clavicle and superficial and deep dissection done and lateral end of clavicle and acromio clavicular joint visualised distal end of clavicle resection done in this case because it was 3 months old and clavicle stabilised with acromion temporarily with k-wires. The clavicle tunnels was prepared in the anatomic locations of the coracoclavicular ligaments Fig.[8,9]

The conoid ligament tunnel was placed 40mm from acromioclavicular joint comparatively medial and posterior aspect of the clavicle. It was directed from the posterior superior cortex towards anterior [coracoid]. It was gradually drilled first with a 3.5mm drill bit, followed by a 4.5mm drill bit. The trapezoid ligament tunnel was prepared similarly. It was placed 20mm from acromioclavicular joint comparatively laterally and anteriorly and directed toward the coracoid.Fig.[10,11]



Fig.8 Distal clavicle excision



Fig.9 Distal clavicle excision



Fig.10 Clavicular tunnel preparation



Fig.11 Clavicular tunnel preparation

Graft passage and repair

The graft was passed into the tunnels and beneath the coracoids, using a curved clamp or a flexible suture passing device. A No.2 Ethibond[®] was passed with the graft into the clavicular tunnels to provide additional initial non-biological fixation of the coraco clavicular ligaments. The graft was passed from the conoid ligament tunnel beneath the coracoid (from medial to lateral) into the trapezoid ligament tunnel. Prior to fixation, the quality of reduction was examined visually. While maintaining the reduction with K-wires, the free ends of the Ethibond[®] were first tensioned and then tied. Then, the sutures of the graft exiting the trapezoid tunnel were tensioned and tied over the graft in order to reconstruct the superior and inferior AC ligaments. Similarly, the other limb of the graft (exiting the conoid tunnel) was tensioned to secure the reduction and was fixed on the superior aspect of the clavicle to the part of the graft running from the trapezoid tunnel to the AC joint, for additional security and reinforcement of the repair. k-wires were removed and stability checked.fig.[12,13,14,15]



Fig.12 Graft passage



fig.13 Graft passage



fig.14 Graft fixation

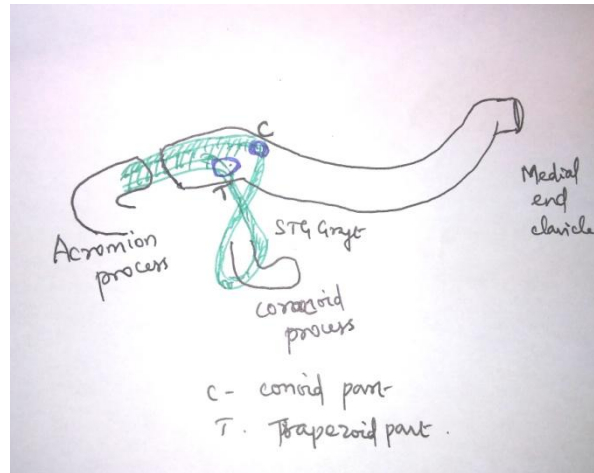


Fig .15 Graft passage and fixation

The fascia was carefully closed with interrupted non-absorbable sutures. Attachments of the anterior deltoid fascia and of the trapezius fascia were brought together with interrupted stitches. The knots were placed on the posterior side of the flap to minimize skin irritation. The subcutaneous layer was closed with 2.0 Vicryl sutures, and a 3.0 vicryl suture was used for skin closure. Fig.16



Fig.16 Postoperative wound status

Postoperative management

Pt was immobilised in shoulder immobiliser for first 3 weeks . then pt was advised gentle movements at the shoulder , pendulum exercise ,flexion ,extension range of movements and abduction limited to 40- 60 degree initially and overhead abduction advised after five weeks only. Fig.17,18

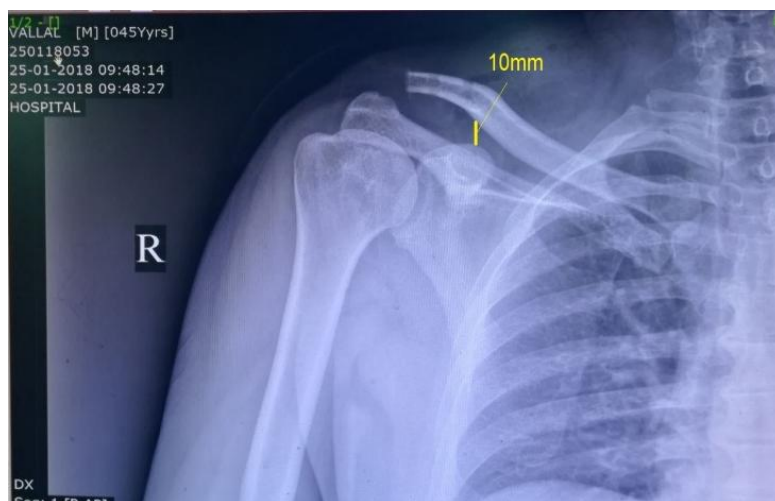


Fig.17 Immediate postoperative radiograph

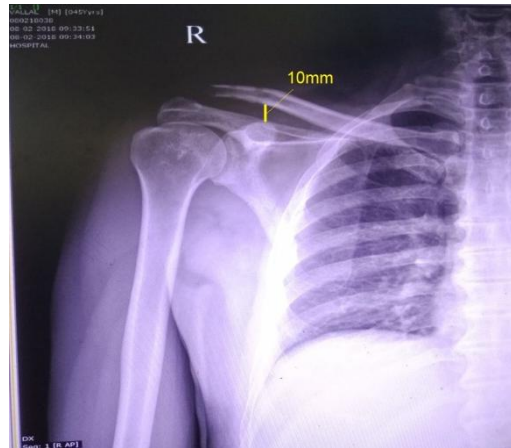


Fig.18 3weeks postoperative radiograph

II. Discussion:

Various implants and fixation methods are tried for treatment of acromioclavicular joint dislocation like Bosworth screws, wires, locking plate. There were hardware problems associated with these and hence soft tissue stabilisation methods was done combined with excision of distal end of clavicle. The surgical technique in our cases are composed of soft tissue reconstruction with or without distal clavicular excision. We reduced complication of hardware and we used only biological reconstruction.

III. Conclusion:

It encourages the use of autologous semitendinosus tendon graft for the treatment of AC joint dislocation. The result was acceptable provided good and reliable clinical and radiological results with a low failure rate at short-term follow-up.

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