Arthroscopic Purse string suture repair for antero inferior traumatic instability'

England

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Vertical Apical Suture Technique for repair of Traumatic antero-inferior instability

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- A Bankart lesion is present in approx. 85% and some degree of Capsular stretching is present in all
- Stabilisation repair methods must correct both problems

Methods of Repair

Most open or arthroscopic methods used non-absorbable sutures , anchors ,tacks

- Or require bone tunnels or holes drilled in glenoid articular face
- Complications have been reported with all implants
- All these implants are expensive

Apical suture method

- Used by myself as an open surgery method since 1980
- To repair the Bankart lesion and tighten capsular laxity at the same time
- Using absorbable or non absorbable sutures
- No anchors tacks or staples were used in the open method

Open Method

- Beach chair position
- G.A. + Interscalene block
- Examination under anaesthetic (EUA) according to Cofield
- Arthroscopy to confirm bankart lesion
- Proceed open repair
- Open low delto-pectoral approach
  Sub-scapularis divided laterally and swept medially to beyond glenoid rim
- Some inferior fibres sub-scap. preserved
- Laterally based 'T' capsulotomy

- Horizontal limb of capsulotomy passes down to bankart lesion
- Vertical suture (North/South) at apex of horizontal capsulotomy
- Suture is tied to leave rolled edge of 'labrum' to act as a neo-labrum or 'bumper'
- Occasionally two sutures may be required
- Anterior capsule is re-apposed to glenoid neck
- Capsular shift may now be added if required in the usual way

Post operative

- Sling with body belt 3 weeks Free sling 3 weeks
- No contact sports 6 months

Patients

- 59 patients (52 men 7 women) with traumatic ant./inf. instability
- Mean age 27 years (range16-53)
- Duration of instability 4.1 years
- March1996-February 1999
- Follow-up Average 42 months (min 2 yrs)
- 8 Patients lost to follow up (but demographic data and operative findings were representative of group)
- 30 right and 29 left shoulders were affected
- Dominant shoulder affected in 29
  4 generalised ligamentous laxity

Evaluation

- 1 patient presented after 1 dislocation
- 51 after recurrent dislocations
- 7 recurrent subluxations
- Mean duration between initial episode and surgery 4.1 years (range 3mths-18 years)

Sport

- 1 Type 1 non-impact
- 32 Type 2 high impact
- 10 Type 3 (overhead hitting)
- 1 Type 4 (overhead hitting sudden stops)

Arthroscopy findings

- All had Bankart lesion
- 46 Soft tissue

· 13 Bony
· 56 Posterior Hill- Sachs
· 3 No Hill-Sachs
· 2 Grade 1 SLAP
· 1 Torn long head biceps
· 1 Partial undersurface tear infraspinatus

Results
· 53 patients (89.8%) Excellent
· 3 " (5.1%) good (Rowe)
· 3 " (5.1%) recurrent dislocation with further trauma

Results
· Mean Rowe score 94.6
· Mean Walch -Duplay score 94.3

Results - Range of Motion
· Mean loss of:-
· Forward elevation 1 degree
· Ext. Rot. 2.4 degrees (arm at side)
2.2degrees (90 Abd)

Results- Sports

Results - Sports
Of 33 patients participating in type1 or2 sports 25 returned to sport at same level
· 6 reduced level
· 2 did not return
· Of 11 patients in type 3 or 4 sports (overhead) 10 returned at same level, 1 at reduced level

Results - AGE AT OPERATION
· 3 of 11 patients under 20 years had recurrence
· None of 48 patientsover 20 years had recurrence (significant $p<0.02$)

Results -Analysis of failure
· The only epileptic patient sustained recurrence following a fit at 1year post op.
A professional rugby player had further Traumatic dislocation playing rugby
· 1 Patient fall skiing -traumatic dislocation 2.5 years post-op

Conclusions

· Vertical apical suture technique offers 94.9% success rate

- 79.5% return to sports at pre –injury level
- Technically less demanding
- All sutures are absorbable
- Complications related to implants avoided (Tacks+anchors)
- Articular surface left undamaged
- Rolled edge to reconstitute 'labrum'
- Cheap

ARTHROSCOPIC PURSE STRING SUTURE TECHNIQUE

The same principles are used but one double loaded suture anchor is used. The Bankart lesion is repaired at the same time as capsular plication. Capsular tension is controlled by the size of the suture "bite". The distance between the superior and inferior limbs of the suture is increased in capsular laxity and decreased with just a pure Bankart lesion. It can be done in either the beach chair position or the lateral decubitous position with lateral traction. A posterior viewing portal is made and then an anterior working portal just superior to subscapularis. An antero superior accessory portal is useful for suture management. The gleno humeral arthroscopy is made and the lesions identified. The extent of the Bankart lesion is noted and the Bankart lesion extended and completely opened using a liberator. The glenoid neck is then decorticated using a rasp or burr on a power shaver back to a bleeding surface. A single suture anchor is placed at approximately the 4 o clock position. The inferior suture is passed through the capsule at approximately 5 or 6 o clock. The size of the capsular bite determines the amount of inferior capsular shift and the capsule is pulled from south to north not east to west in the traditional Bankart repair. When many suture anchors are used in the usual repair then the repair is purely done as an east/west repair with little capsular shift. The inferior suture is passed in an anti–grade manner with sixters or retrograde manner with a suture passer. When using tissue penetrators it is useful to use the ancillary portal with a knot pusher to place the suture in an easily accessible position for the penetrating grasper to put up the suture. The knot pusher is used purely as a suture manipulator. The superior suture limb is now passed at approximately 2 o clock and then the two limbs tied together. This repairs the Bankart and plicates the capsule simultaneously. If a double loaded suture anchor is used then the second suture can be used to adjust the capsular tension more if this is required. The first suture repairs mainly the Bankart. The knot is left in the extra–articular position and even non–absorbable sutures are left in the soft tissues and not in the intra articular position which could cause erosion of the articular cartilage. The anterior labral bumper is reconstituted and a circumferential capsular shift made.

POST–OPERATIVE CARE

A sling with body belt is used for three weeks and then a further three weeks in a free sling.

At six weeks they start physiotherapy to help mobilisation and proprioception with scapular stability and rotator cuff strengthening. They are asked to refrain from contact sports for six months.

We looked at a group of 37 patients with a two to five year follow-up with traumatic recurrent antero inferior instability. There was an average of five dislocations range 1-11. There were five professional international level sportsmen, six semi-professional and eighteen competition level sportsmen. The main sports involved were rugby, soccer and skiing.

Results: Rose score 93. Walch Duplay score 93. 66% went back to sport at the same level and 31% at a decreased level with 3% changing their sport. 85% returned to their sport in the collision sports with 15% returning either at a decreased level or changing their sport.

One patient had symptoms of apprehension only and there was one recurrent dislocation at one year post-operatively in a rugby player with a new major trauma,

CONCLUSION

The arthroscopic stabilisation using the purse string technique is simple and a straightforward technique, excellent short term results. We are now doing a much longer term follow-up with a larger number of patients.