



## Surgical technique and clinical outcome of arthroscopic shoulder stabilization via suture anchors using the lasso-loop stitch



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### ABSTRACT

During arthroscopic Bankart-repair the lasso-loop-stitch can be used. The clinical outcome of this technical modification to a broadly used procedure is not known.

We followed-up 24 patients treated with this technique over 30 months.

We found an excellent clinical outcome in 96% of all cases. The average Rowe-score was 96.3 points. The mean QuickDash was 2.8 points.

Using the lasso-loop-stitch in arthroscopic Bankart-repair is safe and results in very good clinical outcomes. It might lead to an accentuated labral bump and enables secure knot-tying with knot-positioning away from the articular cartilage while avoiding the suture cutting through the tissue.

### 1. Introduction

After primary traumatic shoulder dislocation and conservative treatment, the risk of redislocation is very high in patients younger than 35 years. With age the risk of redislocation after traumatic shoulder dislocation and conservative treatment decreases. Surgical treatment via either open or arthroscopic stabilization minimizes the risk of redislocation.<sup>1–4</sup>

Today, anterior shoulder stabilization by arthroscopic refixation of the labroligamentous complex with suture anchors is becoming the standard therapeutic procedure, if there is no severe chronic bony defect at the glenoid site.<sup>1,5</sup> Lafosse et al. described the so-called „Lasso-loop stitch“.<sup>6–9</sup> This technique allows positioning of the knot away from the joint and at the same time it establishes the sought labral bump.

With the “Oblique mattress lasso-loop stitch” Parnes et al. published a resembling arthroscopic technique, but without giving clinical results.<sup>10</sup>

The surgical principle and aim consist of refixation of the anterior labrum-capsule-ligament complex to the glenoid with positioning of the knot at distance to the joint as well as bulging up the labrum. This is supposed to lead to stabilization of the shoulder joint and should avoid further dislocation and associated pathologies.

Using lasso-loop stitches probably leads to more bulging up of the labrum than with other stitching techniques as for example single

interrupted stitch or mattress stitch. The lasso-loop stitch can enhance the physiological bumper effect of the glenoid labrum and can therefore avoid redislocation.

Indications for this operation are shoulder instabilities with reconstructable damage to the labrum: Bankart lesion, bony Bankart lesion, ALPSA, Perthes lesion, and reversed (posterior) Bankart lesions as well as injuries to the long head biceps tendon anchor (SLAP).

Contraindications are arbitrary shoulder dislocations during growth period without damage to the labrum and chronic bony glenoid defects > 20% of the joint surface.<sup>11–13</sup> HAGL lesions acquire a humeral refixation.<sup>14</sup>

Patient consent should contain the following issues apart from the standard operation risks: cartilage damage, lesion to the axillary nerve, suture rupture, switching to open surgical procedure in case of larger bony defects, standardized postoperative treatment, restriction of motion (especially external rotation), redislocation, anchor dislocation, osteolysis in case of resorbable anchors, posttraumatic arthritis, pain, hospitalization for 1–2 days, day surgery possible, work leave dependent on job and arm dominance 2 days to 16 weeks.

While recording the patient history it is critical to differentiate between traumatic and habitual cause and evaluate the main symptom, either pain or instability. It is followed by a standardized clinical examination including apprehension sign and determination of the instability direction as well as evaluating an existing hyperlaxity. X-rays

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**Fig. 1.** MRI of the right shoulder of a 21-year-old male after primary traumatic anterior-inferior shoulder dislocation. The transverse image shows a classic Bankart lesion (arrow).

of the shoulder in three planes (true a.p., y-view, axial) and MRI (Fig. 1) are performed.<sup>15, 16</sup> The surgical site should be shaved if strongly covered by hair. An examination under anaesthesia is performed to record the passive glenohumeral range of motion following the neutral-zero method as well as evaluation of glenohumeral stability and translation according to the modified Hawkins classification<sup>5</sup> and exclusion of multidirectional instability. In case of larger glenoid defects, a CT scan is necessary.<sup>17</sup>

The aim of this work is to give an illustrated instruction of the operative technique of arthroscopic Bankart repair using the lasso-loop stitch and to analyze the clinical outcome of this surgical procedure.

Based on our experience with this technical modification to the classic arthroscopic Bankart repair, we hypothesize very good clinical results and high patient satisfaction.

## 2. Materials and methods

We identified all 30 consecutive patients (3 females, 27 males), who had been treated for shoulder dislocation with anterior-inferior damage to the glenoid labrum by arthroscopic refixation of the anterior capsulolabral complex with suture anchors in lasso-loop technique in one single orthopaedic center between January and December 2014.

Five patients were either not available or not prepared to take part in the follow up. 25 of 30 patients could be followed up. One patient had to be excluded for a recent ipsilateral elbow fracture dislocation. In this case, no shoulder redislocation occurred.

We operated all patients under full anaesthesia (ENT). Preoperatively a prophylactic antibiotic single-shot dose of 2g Ampicillin and 1g Sulbactam i.v. were given. Dependent on preference the operation can be done in beach-chair-position or lateral decubitus position with lateral tension, which increases the intraarticular space by putting traction on the arm. Alternatively, a special arm holder with free positioning of the arm in slight abduction and external rotation can be used. We routinely used the latter option in all cases.

After diagnostic arthroscopy fixation of the anterior capsulolabral complex with suture anchors in lasso-loop technique was done. Table 1 shows the used instruments.

**Table 1**

Instruments for arthroscopic Bankart operation with lasso-loop stitch.

• Arthroscopy tower with arthroscope (4 mm, 30°), monitor, camera and documentation unit, cold light source, light cable, shaver, hook probe
• Working cannula 8.25 mm x 70 mm (transparent)
• Working cannula 5.5 mm x 72 mm (transparent)
• Bankart raspatory 30° (Co. Arthrex)
• Bankart rasp 30°
• PDS no. 0 as hold-suture
• Birdpeak
• Drill
• Singular armed resorbable suture anchor: Arthrex Bio-SutureTak 3 mm x 14.5 mm with FiberWire

### 2.1. Surgical technique

Figs. 2–4 illustrate the surgical technique.

Incision for posterior arthroscopy portal 2 cm caudal and 2 cm medial of the posterolateral corner of the acromion. Entering the glenohumeral joint with a changing rod, then the arthroscopy sheath, filling the joint up with water and insertion of the arthroscope.

Diagnostic round and incision for the anterior inferior working portal in outside-in technique just above the subscapular tendon and insertion of a working cannula (8.25 mm).

Examination with a hook probe, mobilisation of the labrum with the Bankart raspatory and debridement of the glenoid neck with the Bankart rasp.

Incision for an anterior superior portal and insertion of a working cannula (5.5 mm).

Trial cranialisation of the capsulolabral complex is performed via a grasper through the anterior superior portal followed by insertion of a hold-suture (PDS no. 0).

Positioning of the first single armed resorbable suture anchor through the anterior inferior portal onto the anterior glenoid rim as caudal as possible at the anterior cartilage border. Insertion of the anchor at about 135° to the glenoid plane. Not too steep and not too flat. The anchor should not be inserted too deep either; under no circumstances should the end of the anchor stick out, as this can lead to cartilage damage and cause anchor dislocation.

Cranialisation of the labrum via the hold-suture and refixation of the capsulolabral complex in lasso-loop technique. Also, the second suture end is stitched through and behind the labrum, so the knot comes to lie away from the joint. This suture end represents the drawstring. Seven singular knots are made.

Then the clamp is switched and with the birdpeak the second suture end is pulled anteriorly through the labrum and outside of the joint through the anteroinferior working cannula.

Now the hold-suture can be removed as it is no longer needed after tying of the first anteroinferior suture anchor.

Slightly further cranial labral refixation is undertaken in the same way with the second anchor. A further hold-suture is not needed after the first anchor is sutured.

In most cases an additional third anchor is necessary further cranial for secure labral refixation using the same technique. Enough distance has to be kept from the long head biceps tendon origin not to compromise this tendon mobility.

Final examination of labrum stability with a hook probe and careful clinical verification of joint stability.

Removal of instruments, skin disinfection, closure of the arthroscopic portals via interrupted single Donati backstitches, and sterile wound dressing as well as immobilization with Gilchrist bandage.

#### 2.1.1. Tips and tricks

Only if the second suture end is also positioned behind the labrum, the knot will come to lie away from the joint surface.

Pulling on the one suture end without the loop reattaches the

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