Lateral Ligament Repair / Reconstruction

Introduction

Surgery:

- Primary Anatomical Repair – direct repair of lateral ligament complex (eg. Brostrum)
- Secondary Anatomical Reconstruction – eg Brostrum / Gould reconstruction
- Secondary non-anatomic Reconstruction – use of peroneal tendons (eg. Evans of Christman-Snook) or 'V' allograft.

Indications for Surgery: Recurrent instability, pain, reduced function, laxity on anterior draw / talar tilt
Expected Length of Stay: Day case
Surgeons: Mr McKinley, Mr Clayton, Mr Lawson, Mr Shalaby, Mr Amin.

Scope of Practice

These guidelines are designed to guide the physiotherapist when treating patients following this surgical procedure. These guidelines were produced by a process systematic review of the current evidence based literature and medical and peer consultation. They were correct at the time of writing. The guidelines should be used in conjunction with the clinical reasoning skills of the physiotherapist and patients should always be treated on a case by case basis.

Aim

The aim of these guidelines is to provide physiotherapy staff with a series on recommendations from the current evidence base to assist them in the management of patients who have undergone this surgical procedure.

Literature review question

What is an appropriate rehabilitation program following ankle lateral ligament surgery from say of surgery through outpatient physiotherapy to return to function and sport in order to maximise outcome?

Search Process

Appraisal process: The databases below were searched between 2014 and March 2020. The titles and abstracts of all identified studies were assessed to determine whether they were pertinent to the research question. The search results were combined to ensure articles were not duplicated.
Total number of articles selected: 4
Total number of articles discarded: 2
CASPs used: 0

Data Bases:

Data Base	Dates	Limitations
Medline	2014 - Current	English
EMBASE	2014 – Current	English
ScienceDirect	2014 – Current	English
Cochrane	2014 – Current	English
PubMed	2014 – Current	English
Cinahl	2014 – Current	English

Key Words:

Ankle Lateral Ligament Reconstruction	**AND/OR**
Ankle Lateral Ligament Repair	Physiotherapy
	Physical Therapy
	Rehabilitation
	Post-operative
	Post-surgery
	Mobilisation
	Instability
	Therapy

Results

There has been very little scientific evidence for physiotherapy rehabilitation following ankle lateral ligament repair / reconstruction undertaken in the years since the last update of the guidelines. Some aspects of the rehabilitation process, for example the need for immobilisation for a period following surgery, have been investigated. Many surgeons advised a short (10-14 day) period of immobilisation to allow tissue healing, however some studies who employed immediate weight-bearing after surgery did not report any increase in would complication rates [(11)]. It is important to note that there is little objective evidence to give a definitive answer in this regard.

Key Points

- Please note that timescales are approximate and rehabilitation should be guided, at each stage, by minimal swelling, resolution of pain, good muscle recruitment and no changes in ligament laxity on testing.
- There is a continued lack of good quality studies on appropriate post-operative rehabilitation following ankle lateral ligament repair / reconstruction.
- Early mobilisation in an ankle brace (eg. Aircast) at week 2 promoted earlier return to work, sport and improved plantarflexion power at 3 months, whilst not risking ligament stability. At 6 months, torque values were equal.
- It is important not to stretch into inversion.
- Ensure sufficient eversion strength prior to commencing proprioception exercises.
- The use of functional outcome measures in the literature is limited.

Recommendations:
It is important to note that these recommendations are for guidance only and do not reflect the specific requirements that individual patients may need, depending on the extent of their repair / reconstruction. Guidance from the surgical team should always be sought, as the requirements may vary. Alterations in these guidelines should be made accordingly. Timescales are approximate and rehabilitation should be guided, at each stage, by minimal swelling, resolution of pain, good muscle recruitment and no changes in ligament laxity on testing.

Phase 1: 0 to 2 weeks
Immediately post-op

Goals	Recommendations	
Protect surgical site	Post-op back slab in situ	B
	Non weight-bearing gait with crutched	C

Phase 2: 2 to 6 weeks.
Precautions: Avoid stretching into inversion or plantarflexion
Avoid resistance exercises of peronei following reconstruction

Goals	Recommendations	
Protect surgical site	Ankle brace (eg. Airsport by Aircast at all times. Ankle brace to be removed for physiotherapy and exercises only Gentle scar massage if evidence of adhesion	A/B
Increase ROM	Active ankle range of movement: dorsiflexion, plantarflexion, inversion (not Mr Clayton's patients) and eversion **NB:** Caution with inversion, do not stretch	C
Increase muscle strength	Isometric dorsiflexion, plantarflexion and inversion Eversion if repair, no eversion if reconstruction Maintenance exercises for lower limb	C
Gait	Gait re-education Wean off crutches as able	C
Increase neuromuscular control	Early proprioception exercises: weight transference, forward/backward on rocker board Single leg stand if sufficient eversion muscle power (4-5/5 on Oxford Scale) Progress to side to side rocker board within protective range (repair only)	C

NB: If poorer tissue healing, a moonboot may be required until 6 weeks. This will be determined by the surgeon.

Phase 3: 6 to 12 weeks

Precautions: Eversion strength must be Grade 4 or 5 on the Oxford Scale prior to progressing proprioception exercises
Do not stretch inversion as it will naturally lengthen over time

Goals	Recommendations	
Increase ROM	Calf / TA stretches in NWB, progressing to WB	C
Increase muscle strength	Isometric exercises progressions to through-range (eg. resistance band. **NB:** Caution with inversion as risk of stretching repair)	C
	Lower limb open and closed chain exercises	C
Increase neuromuscular control	Proprioception: bilateral proprioception exercises progressing to unilateral (eg. rocker board forward/backward, single leg stand on stable ground progression to air cushion, wobble board, trampette)	C

Phase 4: 12 weeks onwards

Goals	Recommendations	
Restore full muscle strength and endurance	Progress proprioception exercises	C
	Core/lower limb kinetic chain	
	Consider orthotic referral if required	
	Commence sport specific rehabilitation	

Criteria for Return to Function and Sporting Activity

- A non-reactive ankle
- Subjective outcome measures such as the Lower Extremity Functional Scale (LEFS)

Expectations

The aim of surgery is to re-establish ankle stability to enable function, be it sporting or non-sporting without compromising motion. Long term bracing should not be required, but should be guided by individual clinical judgement. Return to contact sports is predicted between 4 and 6 months. This figure is entirely dependent on individual clinical presentation.

References

1. Ajis A, Younger ASE, Maffulli N (2006) Anatomic Repair for Chronic Lateral Ankle Instability *Foot and Ankle* Clinics 11: 539-545

2. Baumhauer J, O'Brien T (2002) Surgical considerations in the treatment of ankle instability *Journal of Athletic* Training 37 (4) pp458-462

3. De Vries JS, Krips R, Sierevelt IN, Blankevoort L, Van Dijk CN (2011) Interventions for treating chronic ankle instability., issue 8. www.thecochranelibrary.com

4. Fujii T, Kitaoka H, Watanabe K, Luo Z, An K (2006) Comparison of modified Brostrom and Evans Procedure in Simulated Lateral Ankle Injury *Medicine & Science in Sports & Exercise* 38 (6): pp1025-1031

5. Groth AT, Guyton, GP, Schon, LC (2010) Lateral Ankle Ligament Injuries in Athletes: Diagnosis and Treatment. *Operative Techniques in Sports Medicine* 18: pp18-26

6. Kaikkonen A, Lehtonen H, Kannus P, Jarvinen M (1999) Longterm functional outcome after surgery of chronic ankle *instability Scandinavian Journal of Medicine & Science in Sports* (9) pp239-244

7. Karlsson J, Lundin O, Lind K, Styf J (1999) Early mobilisation versus immobilisation after ankle ligament stabilisation *Scandinavian Journal of Medicine & Science in Sports* 9:pp299-303

8. Karlsson J, Rudholm O, Bergsten T, Faxen E, Styf J (1995) Early range of motion training after ligament reconstruction of the ankle joint *Knee Surgery Sports Traumatololgy Arthroscopy* 3: pp173-177

9. Maffulli N, Del Buono A, Maffulli G, Oliva F, Testa V, Capasso G, Denaro V (2013) Isolated Anterior Talofibular Ligament Brostrom Repair for Chronic Lateral Ankle Instability *The American Journal of Sports Medicine* pp1-7

10. Ng ZD & Das De S (2007) Modified Brostrom-Evans-Gould technique for recurrent lateral ankle ligament instability *Journal of Orthopaedic Surgery* 15 (3): pp306-310

11. Pearce CJ, Tourne Y, Zellers J, Terrier R, Toschi P and Silbernagel KG (2016) Rehabilitation after anatomical ankle ligament repair or reconstruction. *Knee Surgery, Sports Traumatology, Arthroscopy* 24, pp. 1130-1139

12. Takao M, Miyamoto W, Matsui K, Sasahara J & Matsushita T (2011) Functional treatment after surgical repair for Acute Lateral Ligament Disruption of the Ankle in Athletes. *The American Journal of Sports Medicine* 40 (2) Vol:40, pp. 447-451

13. Tourne Y and Mabit C (2017) Lateral ligament reconstruction procedures for the ankle. *Orthopaedics & Traumatology: Surgery & Research* 103, pp. 171-181

14. Westlin NE, Vogler HW, Albertsson MP, Arvidsson T & Montgomery F (2003) Treatment of Lateral Ankle Instability with transfer of the Extensor Digitorum Brevis Muscle. *The Journal of Foot & Ankle Surgery* 42 (4): 183-192

15. Zoch C, Fialka-Moser V & Quittan M (2003) " rehabilitation of ligamentous ankle injuries: a review of recent studies*. British Journal of Sports Medicine* 37: 291-295

Bibliography

Olmsted LC, Carcia CR, Hertel, Shultz SJ (2002) Efficacy of the star excursion balance tests in detecting reach deficits in Subjects with Chronic ankle instability. *Journal of Athletic* Training vol:37(40) pp501-506

Disclaimer: This information should be used in conjunction with treatment from an appropriate physiotherapist and not in isolation.

Levels of Evidence

Evidence from large randomised controlled trials (RCTs) or systematic review(including meta-analyses)†	**A1**
Evidence from at least one high quality cohort	**A2**
Evidence from at least on moderate size RCT or systematic review	**A3**
Evidence from at least one RCT	**B**
Expert opinions	**C**
Laboratory Evidence*	**D**

† Arbitrarily, the following cut-off points have been used: large study size ³ 50 patients per intervention group; moderate study size ³ 30 patients per intervention group.

* Arbitrarily, added by Lothian Physiotherapy Musculoskeletal Network Group
Modified from: MacAuley D and Best TM (2007) Evidence-based Sports Medicine. 2nd Edition. BMJ Books. Blackwell Publishing. Oxford, UK.

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Version: **3**
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Date of Original: 2013
Review Authors: Alix Maxwell, Kirstin Snodgrass & Joanna Globan
Review Date: March 2020
Date for Review: 2025