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POSTERIOR-LATERAL CORNER REPAIR PROTOCOL

INITIAL REHABILITATION PHASE
0-4 WEEKS

Goals:

- To be safely and independently mobile with appropriate walking aid, adhering to weight bearing status
- To be independent with home exercise program as appropriate
- To understand self management/monitoring, e.g. skin sensation, color, swelling, temperature, etc
- To be independent with home exercise program

Restrictions:

Ensure that weight bearing restrictions are adhered to:

- Toe Touch weight bearing for 4 weeks
- Hinged brace locked at 20˚ for 3 weeks. After 3 weeks brace can then be adjusted and locked at 0˚ for mobilizing
- Avoid hyperextension, external tibial rotation, and specific active hamstring exercises

Treatment:

- **Pain relief:** Ensure adequate analgesia
- **Advice/Education:** Teach how to monitor sensation, color, circulation, temperature, swelling, and advise what to do if concerned.
- **Swelling Management:** teach protection, rest, icing, compression, and elevation (PRICE)
- **Exercises:** Example of exercises
    - Teach circulatory exercises
    - Remove brace regularly daily for careful active assisted range of movement to work towards 0-90˚
    - Isometric quads and hamstrings in brace
    - Patella mobilizations
- **Mobility:** ensure patient independent with transfers and mobility, including stairs if necessary, with appropriate aid
- **Brace:** to ensure brace fits and patient understands how to don and doff brace as appropriate.

On discharge from ward:

- Independent and safe mobilizing with appropriate aid, including stairs as necessary
- Independent with transfers
- Independent and safe with home exercise program
- Independent with swelling management
- Ongoing out-patient physiotherapy arranged for within 4 weeks post-op

REHABILITATION RECOVERY PHASE
4-8 WEEKS

Goals:

- To be safely and independently mobile with appropriate walking aid, adhering to weight bearing status, progress to PWB
- To be independent with home exercise program as appropriate
- Hinge brace adjusted to allow AROM 0˚-90˚

Restrictions:

Ensure that weight bearing restrictions are adhered to:

- PWB weight bearing until 8 weeks postoperatively
- Avoid hyperextension, external tibial rotation, and specific active hamstring exercises until 3/12 postoperatively
- Brace to be locked at 0˚ when mobilizing

Treatment:

- **Pain relief:** Ensure adequate analgesia
- **Advice/Education:** Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling
- **Posture advice/education**
- **Swelling Management**
- **Mobility:** ensure safely and independently mobile PWB with appropriate aid
- **Exercises:** Example of exercises
    - Knee range of movement exercises
    - Strengthening of muscles stabilizing the knee i.e closed kinetic chain quadriceps exercises in prone. Strengthening exercises of other muscle groups as appropriate
    - Stretches of tight structures as appropriate
- **Manual Therapy:**
    - Soft tissue techniques as appropriate
    - Joint mobilizations as appropriate
- **Monitor** sensation, color, temperature, etc
- **Hydrotherapy** if appropriate
- **Pacing advice** as appropriate
- **Brace:** review brace fit and patient understands how to don and doff brace
- **Electrotherapy** if appropriate.

Milestones to progress to next phase:

- Independently mobilizing PWB using appropriate walking aids
- Achieving AROM 0-90˚ flexion

Failure to meet milestones:

- Refer back to team/discuss with team
- Refer to failure to progress chart

REHABILITATION RECOVERY PHASE
8-12 WEEKS

Goals:

- Mobilizing safely with open hinges on brace and allowing FROM while walking
- Mobilizing FWB with no altered gait
- Reciprocal pattern when using stairs
- Wean from brace if proprioception has improved to allow adequate knee contrl

Restrictions:

- Hinge brace to be worn when mobilizing but unlocked to allow FROM
- Avoid hyperextension, external tibial rotation, and specific active hamstring exercises until 3/12 postoperatively

Treatment:

- **Pain relief**
- **Advice/Education**
- **Posture advice/education**
- **Swelling Management**
- **Mobility:** ensure safely and independently mobile progressing to FWB as able
- **Gait Re-education:** Address issues as appropriate
- **Exercises:** Example of exercises
    - Knee range of movement exercises
    - Strengthening of muscles stabilizing the progressing resistance with theraband/weights and/or COG shift as appropriate
    - Strengthening exercises of other muscle groups as appropriate
    - Core stability and gluteal control work
- **Biofeedback** may be used if altered sequencing of muscles
- **Manual Therapy:**
    - Soft tissue techniques as appropriate
    - Joint mobilizations as appropriate
- **Monitor** sensation, color, temperature, etc
- **Hydrotherapy** if appropriate
- **Pacing advice** as appropriate
- **Electrotherapy** if appropriate.

Milestones to progress to next phase:

- Normal gait fully weight bearing status with no aids wearing brace
- Achieving full AROM
- Bilaterally equal propriocepton tests on single leg stance

Failure to meet milestones:

- Refer back to team/discuss with team
- Refer to failure to progress chart

REHABILITATION RECOVERY PHASE
12 weeks to 6 months

Goals:

- Independently mobile with no brace
- Jogging on even surface with no abnormalities
- Symmetry on hop tests, i.e. multiple single hop stabilization test, single leg hop for distance
- Bilaterally equal strength of quadriceps, hamstrings, hip abductor, hip adductors, and gastro

Restrictions:

- No restrictions, may discard hinge brace, as knee control
- No jogging until proprioception on an uneven surface, knee valgus control when leaping and unilateral closed kinetic chain squat with knee valgus control is achieved
- No return to sport at this phase
- Return to breast stroke swimming at 4/12

Treatment:

- **Pain relief**
- **Advice/Education**
- **Posture advice/education**
- **Swelling Management**
- **Mobility:** progression of mobility and function
- **Gait Re-education**
- **Exercises:**
    - Jogging
    - Plyometrics
    - Jump training
    - Agility training
    - Hop tests
    - Multiple single hop stabilization test
    - Strengthening through range to include OKC quadriceps if appropriate
    - Introduction of sports specific and occupation specific rehabilitation
    - Core stability and gluteal control work
    - Stretches of tight structures as appropriate
- **Review lower limb biomechanics and kinetic chain**, addressing issues as appropriate
- **Balance/Proprioception** work progressing to unstable BOS and COG shift
    - Progress from static to dynamic exercises as appropriate
- **Manual Therapy:**
    - Soft tissue techniques as appropriate
    - Joint mobilizations as appropriate
- **Monitor** sensation, color, temperature, etc
- **Hydrotherapy** if appropriate
- **Pacing advice** as appropriate
- **Electrotherapy** if appropriate.

Milestones for discharge:

- Good proprioceptive control dynamically
- Return to normal functional level
- Satisfied criteria for functional testing and return to sports if set as patient goal

Failure to meet milestones:

- Refer back to team/discuss with team
- Refer to failure to progress chart

REHABILITATION RECOVERY PHASE
6 months to 1 year

Goals:

- 1RM single leg press RSI greater than or equal to 125% (Calculation of Relative Strength Index RSI (%)=weight pushed (kg) ÷bodyweight (kg) × 100)
- LSI 85% - 100% of knee extensors (Calculation of Limb Symmetry Index LSI (%)=injured limb score ÷uninjured limb score × 100)
- Symmetry on hop tests, i.e. multiple single hop stabilization test, single leg hop for distance
- If satisfied criteria for functional testing then for graded return to sport if set as patient goal
- Establish long term maintenance program

Restrictions:

- Return to sport when has satisfied functional performance testing requirements and when consultant has agreed for patient to return to sport: this is expected to be after 1 year postoperatively

Treatment:

- **Pain relief**
- **Advice/Education**
- **Posture advice/education**
- **Swelling Management**
- **Mobility:** progression of mobility and function
- **Gait Re-education**
- **Exercises:**
    - Jogging
    - Plyometrics
    - Jump training
    - Agility training
    - Hop tests
    - Multiple single hop stabilization test
    - Strengthening through range to include OKC quadriceps if appropriate
    - Introduction of sports specific and occupation specific rehabilitation
    - Core stability and gluteal control work
    - Stretches of tight structures as appropriate
- **Review lower limb biomechanics and kinetic chain**, addressing issues as appropriate
- **Balance/Proprioception** work progressing to unstable BOS and COG shift
    - Progress from static to dynamic exercises as appropriate
- **Manual Therapy:**
    - Soft tissue techniques as appropriate
    - Joint mobilizations as appropriate
- **Monitor** sensation, color, temperature, etc
- **Hydrotherapy** if appropriate
- **Pacing advice** as appropriate
- **Electrotherapy** if appropriate.

Failure to progress:

If a patient is failing to progress, then consider the following:

Possible Problem	**Action**
Swelling	Ensure elevating leg regularly. Use ice as appropriate if normal skin sensation and no contraindications. Decrease amount of time on feet. Pacing. Use walking aids. Circulatory exercises. Modify exercise program as appropriate. Should continue isometric work at all times. If decreases overnight, monitor closely. If does not decrease over a few days, refer back to surgical team
Pain	Decrease activity. Ensure adequate analgesia Elevate regularly. Decrease weight bearing and use walking aids as appropriate. Pacing. Modify exercise program as appropriate. Should continue isometric work at all times. If persists, refer back to surgical team.
Breakdown of would, e.g. inflammation, bleeding, infection	Refer to surgical team.
Recurrent Instability	Refer back to surgical team. Ensure exercise progressions are at suitable level for patient. Address cores stability.
Numbness/altered sensation	Review immediate post-operative status if possible. Ensure swelling under control. If new onset or increasing refer back to surgical team. If static, monitor closely, but inform surgical team and refer back if deteriorates or if concerned.

Appendix

Calculation of Limb Symmetry Index
LSI (%) = injured limb score ÷ uninjured limb score × 100

Calculation of Relative Strength Index
RSI (%) = weight pushed (kg) ÷ bodyweight (kg) × 100

Summary of evidence for physiotherapy guidelines

A comprehensive literature search was carried out to identify research relating to rehabilitation following posterior cruciate ligament of the knee. After the reviewing the articles and information, the physiotherapy guidelines were produced on the best available evidence.

Clark N (2001) Functional Performance Testing Following Knee Ligament Injury.
Physical therapy in Sport 2, 91-105

Dick F 1989 Sports Training Prionciples, 2nd Edition, A&C Black, London

Heyward V 1998 Advanced Fitness Assessment and Exercise Prescription, 3rd Edition, Human Kinetics, Illinois

Sapega A 1009 Muscle Performance Evaluation in Orthopaedic Practice.
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