

Rehabilitation following hip arthroscopy for FAI

Physiotherapy protocol

Takla-O'Donnell Protocol (TOP)

4 phases of treatment

1. Pre-operative education and advice
2. Protect healing tissues and maximise mobility (Day 1 – Week 2)
3. Local stabilisation and maintenance of fitness (Week 2 – 6)
4. Resumption of loading, development of skilled movement and prevention of further injury (Week 6-12)

Treatment phase 1 – Pre-operative education and advice

Phase 1 goals:

1. Educate regarding anatomy of the hip and FAI concepts – Cam, Pincer or Combined impingement
2. Educate patient regarding “do’s” and “don’ts” following procedure
3. Teach deep hip rotators (DHR) retraining in prone – quadratus femoris, oburator internus and the gemelli
4. Teach use of crutches

Phase 1 interventions:

| <i>Treatment strategy/intervention</i> | <i>Rationale/Evidence</i> |
|---|---|
| DHR retraining in prone– minimum of one minute per hour for seven days prior to surgery | The deep hip rotators (“rotator cuff” of the hip) provide dynamic hip stability |
| Fit crutches and ensure independent and comfortable use | |

Treatment phase 2 – Protect healing tissue and improve mobility (Day 1 – Week2)

Phase 2 goals:

1. Protect healing tissue
2. Minimise pain and inflammation
3. Maximise pain-free range of motion within surgical restrictions
4. Progress DHR control to maximise stability

Phase 2 precautions:

- Avoid hip flexion past 90 degrees for four weeks
- Minimise exercise volume and intensity in those with micro fracture
- Avoid all rotary activity for 4 weeks in those with ligamentum teres tear
- No physical work/manual handling.
- Avoid squatting, lifting and twisting
- Minimise car travel – knees together when getting in and out of car
- Minimum of one week off work unless instructed otherwise by surgeon

Phase 2 interventions:

| <i>Treatment strategy/intervention</i> | <i>Rationale/Evidence</i> |
|---|--|
| Ice – 20 minutes every 2 hours for 4 days post-operatively | |
| Medication – NSAID and analgesia as instructed by surgeon | |
| Crutches to improve comfort and normalise gait pattern | |
| Progress DHR retraining from prone to sitting, lying and standing | |
| Gentle ROM/stretching within surgical restrictions | Those with FAI have been found to have restrictions in hip IR and FI ROM |

Phase 2 Indicators for progression to next phase

- No complaints of pain with phase 2 exercises and activity
 - Appropriate activation of DHR in prone
-

Treatment phase 3 – Local stabilisation and maintenance of fitness (Week 2-6)

Phase 3 goals:

1. Normalise gait
2. Return to normal activities of daily living within surgical restrictions
3. Minimise compensatory muscle recruitment patterns and progress DHR retraining
4. Restore ROM within surgical restrictions
5. Maintain fitness

Phase 3 precautions:

- Avoid bridging position due to potential to aggravate pain/inflammation

Phase 3 interventions:

| <i>Treatment strategy/intervention</i> | <i>Rationale/Evidence</i> |
|--|---|
| Progress to DHR retraining in 4-point kneeling, ensuring correct activation and minimising compensatory patterns | |
| Wean off crutches and focus on correct muscle activation patterns in gait | |
| Cycling on an upright stationary bike, avoiding hip flexion past 90 degrees, 15 mins per day at moderate speed and intensity | |
| Cross trainer for 15 mins per day at moderate speed and intensity | |
| Soft tissue work to promote joint range of motion and assist with pain relief | Common pattern areas of inappropriate recruitment muscles include adductors, TFL and gluteus medius |
| Pain-free gentle muscle stretching to quadriceps, calves and psoas (the latter in Thomas test position only) | |
| Anterior hip stretch 5minutes daily (leg over edge of bed) | |

Phase 3 indicators for progression:

- Appropriate activation of DHR in 4-point-kneeling
-

Treatment phase 4 – Resumption of loading, development of skilled movement and prevention of further injury (Week 6-12)

Phase 4 goals:

1. Progress DHR retraining to dynamic positions
2. Restore full pain-free ROM past 90 degrees flexion
3. Improve balance, proprioception and neuromuscular control
4. Restore global muscular strength and endurance
5. Restore cardiovascular fitness

Phase 4 precautions:

- Avoid full squats, lunges, skipping, pilates and yoga

Phase 4 interventions:

| <i>Treatment strategy/intervention</i> | <i>Rationale/Evidence</i> |
|--|---------------------------|
| Increase DHR loading with resistance band in 4-point kneeling then in weight-bearing | |
| Continue stretches | |
| Dry needling to treat adductors and TFL as required | |
| Single leg balance exercises | |
| Theraband with gluteal loading | |
| Leg extension/hamstring curl exercises | |
| Quarter squats with focus on correct technique | |
| Walking 30min every second day | |
| Deep water running | |
| Increase volume on stationary bike, cross trainer and stepper | |

The Takla-O'Donnell Protocol – “TOP”

FOC – 12 weeks program

1. Pre-op

- i. Advice**
- ii. DHR program**
- iii. Education can and cannot do**
- iv. Questions**

2. Post – op 2 weeks

- i. Check wound/stiches out**
- ii. Hip ROM – Flex, IR, FABER, FADIR, IR/ER in neutral**
- iii. DHR able to activate**
- iv. Normal gait pattern, no limp, no crutches**
- v. Return to work, driving if they are comfortable**
- vi. Start bike – ROM only no load, walking in pool (if wound healed)**

3. Week 4

- i. ROM**
- ii. Qf – strong, started with therabands**
- iii. WB Qf ex's – Arabesques, ¼ squat ex's against wall**
- iv. Bike, Xtrainer, pool – no kicking**
- v. Lx spine clearing Assessment**
- vi. Soft Tissue Work (STW) – rect fem, psoas, adductor brevis/longus)**

4. Week 6

- i. Check ROM**
-

- ii. Qf strength with ER,
- iii. Jogging drills – on oval – 3 times a week, progressing over three weeks to 4 km 3 times a week
- iv. Sports specific drills – kicking, changing direction, handling, jumping and landing drills

(NORMALLY DISCHARGE HERE)

5. Week 8

- i. Strong DHR (QF especially)
- ii. Full ROM
- iii. Lx clear
- iv. Sport specific drills
- v. Accelerating and change of direction drills

6. Week 10

- i. Initiate squats
- ii. Lunges
- iii. Leg press
- iv. Full sports specific training i.e gymnastics, tennis

7. week 12

- i. Sprints
 - ii. Kicking drills
 - iii. D/c
-

FOC / Labral repair – 12 weeks program

1. Pre-op

- i. Advice – importance for crutches use – “no limp”**
- ii. DHR program**
- iii. 4 point mobility ex’s to avoid adhesions**
- iv. Education can and cannot do**
- v. Questions**

2. Post – op 2 weeks - “ have started 4 point rotation work to avoid adhesions”

- i. Check wound/stiches out**
- ii. Hip ROM – Flex, IR, FABER, FADIR, IR/ER in neutral**
- iii. DHR able to activate**
- iv. Leg over the side of the bed – modified Thomas stretch position**
- v. Normal gait pattern, no limp, no crutches**
- vi. Return to work**
- vii. Start bike, walking in pool (if wound healed)**
- viii. Driving permitted**

3. Week 4

- i. ROM**
 - ii. Qf – strong, started with therabands**
 - iii. WB Qf ex’s – Arabesques, ¼ squat ex’s against wall**
 - iv. Bike, Xtrainer, pool – no kicking**
 - v. Lx spine clearing Assessment**
 - vi. Soft Tissue Work (STW) – rect fem, psoas, adductor brevis/longus)**
-

4. Week 6

- i. Check ROM**
- ii. Qf strength with ER,**
- iii. Jogging drills – on oval – 3 times a week, progressing over 4 weeks to 4 km 3 times a week by week – Grass / running track only !!**

5. Week 8

- i. Strong DHR (QF especially)**
- ii. Full ROM**
- iii. Lx clear**
- iv. Sport specific drills**
- v. Accelerating and change of direction drills**
- vi. Sports specific drills – kicking, changing direction, handling, jumping and landing drills**

6. Week 10

- i. Initiate squats**
- ii. Lunges**
- iii. Leg press**
- iv. Full sports specific training i.e gymnastics, tennis**

7. week 12

- i. Sprints**
 - ii. Kicking drills/ twisting drills/ tennis serve practice etc.**
 - iii. D/c**
-

Issues:

- 1. Synovitis – patients are placed on NSAIDs for 30 days and panadol Osteo for 7 – 14 days to control pain and inflammation ----- This has certainly made physiotherapy much easier.**
- 2. Patient education – patients are educated about the need to ensure “no limp” before crutches are returned**
- 3. Risk of Adhesions due to Labral repair – early but controlled rotation ex’s to avoid this.**

FOC / Labral repair / Lig tere / Micro # *- 12 weeks program

1. Pre-op

- i. Advice – importance for crutches use – “no limp”**
- ii. DHR program**
- iii. 4 point mobility ex’s to avoid adhesions**
- iv. Education can and cannot do ** more emphasis on risk of lig teres re-tearing**
- v. Questions**

2. Post – op 2 weeks

- i. Check wound/stiches out**
 - ii. Hip ROM – Flex, IR, FABER, FADIR, IR/ER in neutral**
 - iii. DHR able to activate**
 - iv. Leg over the side of the bed – modified Thomas stretch position**
 - v. Normal gait pattern, no limp- (may need crutches on and off if large lig teres tear > 50%)**
 - vi. Return to work ***
-

- vii. Start bike, walking in pool (if wound healed) *
- viii. Driving permitted *

* if micro # large –wait one more week

3. Week 4

- i. ROM
- ii. Qf – strong, started with therabands
- iii. WB Qf ex's – Arabesques, ¼ squat ex's against wall (If ligament symptoms have settled) *
- iv. Bike, Xtrainer, pool – no kicking
- v. Lx spine clearing Assessment
- vi. Soft Tissue Work (STW) – rect fem, psoas, adductor brevis/longus,

4. Week 6

- i. Check ROM
- ii. Qf strength with ER,
- iii. Jogging drills – on oval – 3 times a week, progressing over 4 weeks to 4 km 3 times a week by week – Grass / running track only !!

5. Week 8

- i. Strong DHR (QF especially)
- ii. Full ROM
- iii. Lx clear

6. Week 10

- i. Duck walk initiated
 - ii. Theraband with global muscle loading
 - iii. Accelerating and change of direction drills initiated
 - iv. Sports specific drills – kicking, changing direction, handling, jumping and landing drills
-

v. Jogging drills – on oval

vi. Sports specific drills

7. week 12

i. Sprints

ii. Kicking drills/ twisting drills/ tennis serve practice etc.

iii. Education Qf/DHR loading for a further 3 months – to ensure normal endurance is regained ----- This group is tough-----

Issues:

- 1. Lig teres – May become inflamed again - so major emphasis on no twisting, rotation, squat or lifting from the ground.**
 - 2. 4 point ex's for mobility to prevent adhesions**
 - 3. education emphasis on NSAIDs and Panadol Osteo – certainly make rehab easier.**
 - 4. * Micro fracture – pain potential issue from week 4 – 8 weeks.**
-

Lig teres isolated/ +/- Acetabular spur – 12weeks program

1. Pre-op

- i. Advice**
- ii. DHR program**
- iii. Education can and cannot do**
- iv. Questions**
- v. Precautions ++++++++++**

2. Post – op 2 weeks

- i. Check wound/stiches out**
- ii. Hip ROM – Flex, IR, FABER, FADIR, IR/ER in neutral**
- iii. DHR able to activate**
- iv. Normal gait pattern, no limp, no crutches**
- v. Return to work, driving**
- vi. Start bike, walking in pool (if wound healed)**

3. Week 4

- i. ROM**
- ii. Qf – strong, started with therabands**
- iii. Bike, X-trainer, pool – no kicking**
- iv. Lx spine clearing Assessment**
- v. Soft Tissue Work (STW) – rect fem, psoas, adductor brevis/longus)**

4. Week 6

- i. Check ROM**
 - ii. Qf strength with ER,**
 - iii. Lx mobility**
-

5. Week 8

- i. Strong DHR (QF especially)**
- ii. Full ROM**
- iii. Lx clear**
- iv. Sport specific drills Jogging drills – on oval – 2 times a week, progressing over three weeks to 4 km 3 times a week**
- v. Sports specific drills – kicking, changing direction, handling, jumping and landing drills**
- vi. Accelerating and change of direction drills**

6. Week 10

- i. Initiate squats**
- ii. Qf with heavy bands, add global muscle retraining – Duck walk etc**

7. week 12

- i. Sprints**
- ii. Kicking drills**
- iii. Sports specific drills – kicking, changing direction, handling, jumping and landing drills**
- iv. D/c**

******* Most Difficult group *******

Issues:

Risk of re-tearing

Potential risk of instability

Require significant education what they can and cannot do.

Must avoid deep hip bend till week 6

MUST regain full strength in DHR otherwise will have issues

The more mobile they are, the harder they have to work.

---- Most common in young, active females – e.g. Dancers, Gymnasts etc.

- **Patient education** is an essential component of the program. The education component covers information about FAI, advice about joint protection and return to physical activity/sport. Patient information handouts will be provided (Appendix 4).
- **Gait aid prescription** should ensure safe and independent ambulation post-operatively to protect the joint and allow healing. Progression off gait aid will depend on pain and quality of gait pattern
- **Manual therapy techniques** include: sustained stretches, and/or soft tissue techniques.
- **Stationary cycling** will be incorporated into the program at the first physiotherapy visit (Week 2 post-surgery) by asking the patients to cycle for up to 15 minutes at a moderate level of intensity ("somewhat hard" or level 13 on the Borg Rating Scale of Perceived Exertion)
- **Home exercises** include: deep hip rotator retraining, muscle stretches, strengthening, functional neuromuscular control (incorporating balance, proprioception and gait drills) and lumbopelvic control.

Home exercises are to be performed daily.

The Home Exercise Program must include DHR retraining (TOP). Generally include only 4 other exercises unless there is a strong clinical indication and a compliant patient. The starting level chosen depends upon the individual and all exercises should be progressed through the program.

The Home Exercise Program will change during the course of the 12 weeks of physiotherapy, and exercise selection will depend upon the surgical procedure carried out during the hip arthroscopy.

Mandatory home exercise - pre-operative to 2 weeks post-surgery

1. DHR strengthening/retraining.

Mandatory home exercise Week 2 to Week 12:

1. DHR strengthening/retraining.
2. Anterior hip stretch over edge of bed
3. Stationary cycling

Additional home exercises Week 6 to Week 12:

4. Up to three strengthening exercises
5. Up to three lower limb muscle stretches
6. Balance/proprioception
7. One lumbopelvic control exercise.

The home exercises must be checked and discussed at every visit. Check technique and progress the exercises as needed. Work with the patient to maximise adherence to the program. Check the Log Book and sign off to indicate

that this has been discussed. If the patient is not compliant, then discuss barriers/obstacles and problem solve with the patient (see suggestions in table following exercise descriptions).

Dosage (unless otherwise specified):

Strengthening – Recommended dose is 3 sets of 10 repetitions with a 3 second hold. Progress the load/reps/difficulty according to the manual.

The resistance needs to be such that the patient is working at a high intensity of their one repetition maximum. This can be judged by asking the patient to use the modified Rating Perceived Exertion Scale (RPE) as shown on the following page to rate their overall effort during the exercise. The patient should be working at an intensity that they would rate as 5 to 8 on the RPE Scale. Resistance and difficulty of the exercises need to be progressed to ensure strength gains are achieved. Each patient will be given a copy of the RPE scale so that they can ensure that they are working at an appropriate intensity.

Modified Rating Perceived Exertion Scale
(Day et al J Strength Conditioning Res 2004)

| Rating | Descriptor |
|--------|------------|
| 0 | Rest |

| | |
|----|-----------------|
| 1 | Very, Very Easy |
| 2 | Easy |
| 3 | Moderate |
| 4 | Somewhat Hard |
| 5 | Hard |
| 6 | - |
| 7 | Very Hard |
| 8 | - |
| 9 | - |
| 10 | Maximal |

Stretching – Recommended dose is 2 minutes total for each stretch, comprised of two or more repetitions with 20-60 sec hold times. Often times it is more comfortable for the patient if the holding times are shorter.

Functional neuromuscular balance/gait drills - Choose the most challenging exercises the patient can achieve safely and choose functional drills that relate to the patient's problems as determined by the assessment. Recommended dose is 2 different exercises each for 4 x 30 seconds (4 minutes total). Safety is important and should be emphasised to the patient. The drills can be changed from week to week to reflect the assessment findings and goals of treatment. The gains in strength and range that are achieved with treatment should then be applied in these functional drills. Therefore, choose drills that reinforce and complement the other treatments employed. For example, hip abductor strengthening exercises can be followed by standing eccentric control of the hip abductors etc.

4.4.2. Exercises Deep Hip Rotator retraining ("TOP")

Stage 1 – Quadratus Femoris in prone

Starting position

Lie on your stomach with your knees approximately 20cm apart.

Bend your knees to 90 degrees.

Place the sole of the foot on your non-operated leg against the inner surface of your ankle on your operated side.

Exercise

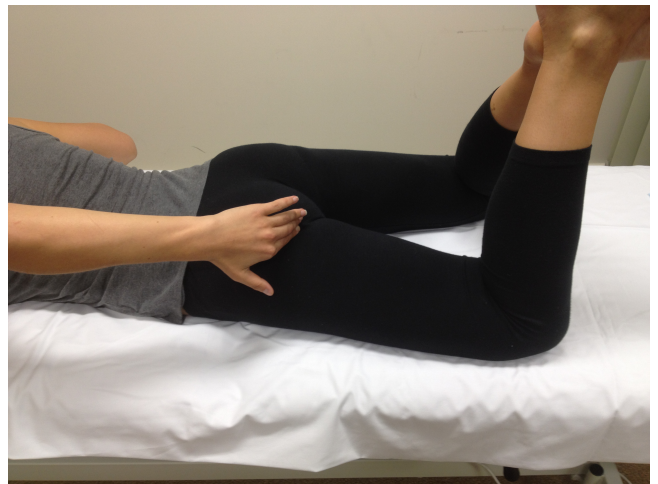
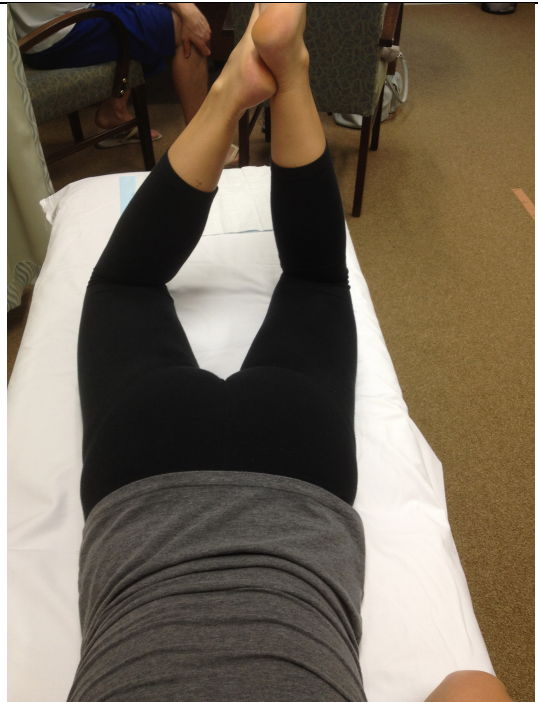
Keeping your thigh on bed, press the ankle on your operated side against the sole of the other foot.

The muscles in the buttock will tense, but do not allow your leg to twist.

You may place your fingers on to check you are contracting the correct muscles.

Dosage

60 sec x 4 – 4 times a day



Stage 2 – Quadratus femoris in 4-point-kneeling

Starting position

Kneel on all fours

Exercise

Qf on

Dosage

1 min x 4 –



Stage 3- Quadratus femoris in 4-point-kneeling with rotation

Starting position

Kneel on all fours

Exercise

Qf on

External rotation of the hip

Control the hip

"Learn"

Dosage

1 min x 4



Stage 4- Quadratus femoris in 4-point-kneeling with external rotation

Starting position

Kneel on all fours

Exercise

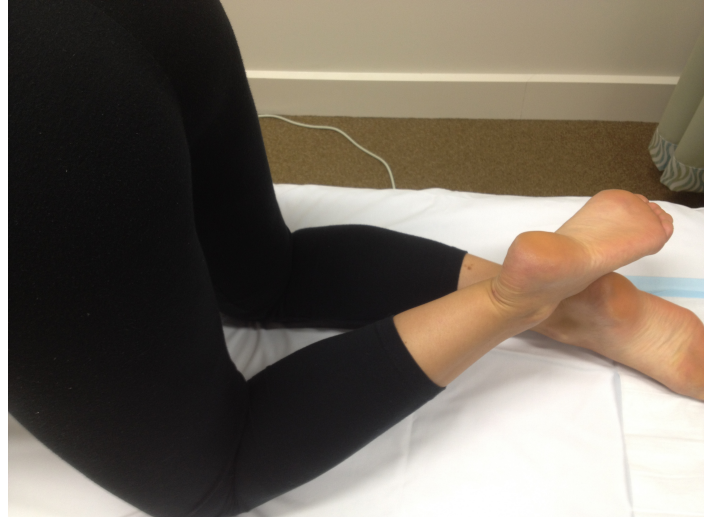
Qf on

Rotation x 4

Control important at all times

Dosage

1min x 4



Stage 5- Quadratus femoris in 4-point-kneeling with external rotation and resistance band

Starting position

Kneel on all fours with resistance band around your ankle on your operated side.

Exercise

Qf on
Blocks of 5

Dosage
1min x 4



Stage 6- Quadratus femoris in 4-point-kneeling

Starting position

Kneel on all fours

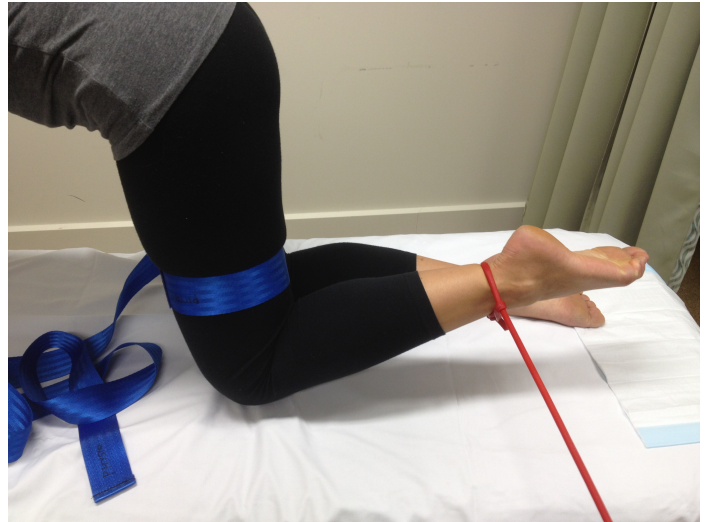
Exercise

Qf on

Add traction belt to add
Isometric hip abduction

Dosage

1min x 4



Stage 7 -

Starting position

Arabesque

Exercise

Qf on

Stable pelvis

Balance on one leg as the other
raises back

Dosage

Aim for 26 in a row



| | |
|--|--|
| | |
|--|--|

4-POINT KNEE INTERNAL/EXTERNAL ROTATION:

Patient is 4-point kneeling with minimal load through the affected side knee. Patient actively twists their foot outwards into internal rotation then inwards across the top of the other leg

