Nadim Aslam
Consultant Sports and Reconstructive Knee and Hip Surgery

Mr Nadim Aslam
BMSc MB ChB FRCS(Eng) FRCS(Tr & Orth) MFSEM (UK)
PRIVATE PRACTICE MANAGER
TEL: 01905 362003
FAX: 01905 362004
EMAIL: nadim.aslam@spirehealthcare.com
WEB: www.nadimaslam.com
ALL CORRESPONDENCE
Bone and Joint Clinic
Spire South Bank Hospital
139 Bath Road
Worcester, WR5 3YB

ACL REHABILITATION

The overall rehabilitation plan emphasises the importance of pre-operative exercises followed post operatively by early control of swelling and regaining full extension (straightening) and flexing of the knee (bending). Working on strength can only start once swelling and range of movement have been controlled. Return to function then follows.

Key to Success

The key to successful rehabilitation is to regain normal, full straightening of the knee as soon as possible, and to control swelling in the early post operative phase before progressing to strength activities. For the first six weeks, until the new graft is well bedded in and healed in place, exercises are performed gently with the aim of regaining normal bending and straightening as the swelling settles. Repetitive cycling of the knee is restricted during the first 6 weeks as this may overload the fixation of the ligament and lead to slippage of the graft and effective lengthening of the new ligament.

During exercises the foot is initially kept in contact with the ground or with the surface of an exercise machine – these are called ‘closed’ kinetic chain exercises.
Elevation of the leg between exercises to reduce swelling is also important and helps allow the bending to improve.

‘Open’ kinetic chain exercises, where the foot is unsupported, are introduced towards the end of the first six weeks as knee control and strength improves. This allows muscle strength to improve without putting excessive stress on the graft.

GENERAL PRINICPLES: REHABILITATION

Exercises need to be done 4 – 5 times per day: little and often is better than an extensive overload period.

Pain, heat and increasing swelling in the knee are potentially bad. Any of these symptoms can mean that exercises are being overdone. This is unlikely to indicate a serious problem, but these symptoms should be discussed with the physiotherapist.

The difference between good and bad pain: After major knee surgery the knee will be sore. It is important to understand that discomfort is normal - particularly when doing some of the stretching exercises. The knee may also ache after an exercise session. This is expected and normal so long as it is not associated with any significant increase in swelling. ‘Bad pain’ is usually sharp and severe in nature. It may be brought on by pushing too hard, and it may be accompanied by an increase in swelling. Activities causing such a problem should be stopped and advice sought from the physiotherapist.

REHABILITATION PHASES

There are six main rehabilitation phases and example exercises for each phase are given in the sections that follow. Many different exercises are available to achieve the goals and these are tailored to each individual by the physiotherapy team. Various example exercises are outlined in each section.

Phase 1: Pre-operative preparation/operative period
Phase 2: Initial Post-operative Phase: First 2 weeks
Phase 3: Proprioception (sensory awareness) Weeks 3 –6
Phase 4: Strength Phase: Weeks 6 – 12
Phase 5: Early Sport Training: Months 3 - 6
Phase 6: Return to Sport: Months 6 – 9

Specific Follow-up assessment: Out-patient review takes place at the following times and the goals for those stages are detailed in the guidelines:

2 weeks
6 weeks
3 months
6 months
1 year

PHASE 1

Pre-operative Preparation and Operative Period

Pre Op Rehabilitation begins before surgery in the pre-operative phase to ensure that the individual and their knee are ready for the operation. Ensure full range of movement, especially normal hyperextension, i.e. so the knee extends to the same as the other leg.

Exercises to maintain quadriceps and hamstring muscle strength. Start balance control exercises. Advice session in the physiotherapy department for familiarisation with post op exercises and hospital stay.

Initial Post-operative Period

The aim is to go home comfortable and ready for rehabilitation on the first postoperative day. Sometimes it is possible to go on the day of surgery. The dressings are changed on the 1st postoperative day along with instruction on using crutches the exercises to be performed for the first 2 weeks. Crutches are required for the first 2 weeks taking partial weight on the leg.

Instructions on Discharge from Ward

The following is a list of instructions and expectations given before leaving the ward. Keep the wound dry for 3 days or until the wound has sealed. Instruction on use of Cryocuff or ice packs to control swelling.

Clips or Stitches to be removed at 7 days by a local surgery or district nurse. Appointment for review in clinic or on the ward after 2 weeks. Date for first out-patient physiotherapy appointment.

Work Advice: to expect to be able to return to work as follows:
Desk work at 3 – 4 weeks
Light manual work at 6 weeks
Heavy manual work (ladder work etc) at 3 – 4 months.
Driving Advice: return to driving at 3 – 4 weeks depending on knee function.

PHASE 2

Initial Post-operative Phase – First 2 Weeks

Aim: The aim of this phase is to regain the range of joint movement and to allow swelling in the knee to settle. The most important aim is to regain normal and full extension (straightening) of the knee. After seeing the physiotherapist on the ward the next appointment is usually one week following surgery to add in extra exercises.

2 Week Review Goals

Range of movement: full knee extension to 110^{o} flexion
Wound healed
Minimal swelling in knee and around wound
Normal walking pattern
Independent leg control

PHASE 3

Proprioception Phase (Sensory Awareness) Weeks 3 – 6

Aim:

The aim of this phase is to work on proprioceptive exercises and to develop light endurance and strength training. This stage is also important for developing core stability to help you progress to full active function. By the end of six weeks your knee should feel normal in activities of daily living.

6 Week Review Goals

Full range of movement including normal hyperextension

Minimal Swelling in knee

Full patella mobility

Minimal discomfort

PHASE 4

Strength Phase - Weeks 6 – 12

Aim

At six weeks the graft will be solidly fixed into bone so that more vigorous strength training can start. Thigh muscle tone and definition (quadriceps / hamstrings) will be hopefully have been maintained during the first post op phase and now the main strength work can begin. Progress is monitored and controlled by the recovery of strength and muscle control. It is important to avoid too rapid progress, as there is a risk of developing overload complications

3 Month Review Goals

Full range of movement

No swelling

Confident feeling of stability

PHASE 5

Early Sport Training Phase - Month 3 - 6

Aim

Pivoting and cutting movements are introduced at this stage, building up to light sport training. This involves a progressive programme of slow and moderate speed strength training and agility drills. Manual work should be possible within the restraints of the occupation. Exercises for power and agility training are introduced. Many sport specific skill training exercises can be introduced at this stage and detail for particular sports is given in the next section as there is some overlap during these phases. The new ligament is still at significant risk of re-injury or of stretching out if progress back to full levels of sport is too fast.

There is no one solution that fits all individuals; great emphasis is given on the care in progressing through this phase back to sport. Supervision by a physiotherapist, sports coach or trainer is key, as drill and skill acquisition is dependent on individual muscular control patterning in addition to individual relative strength deficits around the hip, knee and ankle.

6 Month Review Goals

Full Range of movement

Functional and Strength tests: 85% of normal side

Return to non-contact sports training

PHASE 6

Return To Sport Phase – Month 6 – 9 And Beyond

Aim

The aim of this phase is to progress sport training and to develop strength and endurance levels to allow return to full sporting activity. This takes time, especially in building up confidence to progress to full contact activities.

Return to contact sport is not recommended until strength and functional outcomes are measured at greater than 85% of the normal knee. It should be remembered that the time to regain pre-injury level of skill and performance is very variable but can take 3 – 4 months of training and playing.

This confidence can be helped by introducing modified training and specific drills early, often in conjunction with club or team activities. Progress is best achieved in conjunction with a general fitness programme, as this will have reduced over time since the injury and surgery.

Full contact sport is, in general, best avoided until able to tolerate a full -training session with confidence in full fitness and endurance.

The full rehabilitation document outlines the principles of getting back to the same level of sport and draws on the knowledge gained by understanding the possible mechanisms for injuring the ligament in the first place.

RETURN TO SPORT

Introduction

This section describes the techniques to try and optimise return to sport following ACL reconstruction. The first section summarises the overall principles of getting back to sport, and this is then followed by more in-depth concepts for specific sports. Various different rehabilitation experts have contributed to this section.

Getting an individual back to their previous level takes specific rehabilitation tailored to the particular sport. Whilst the goal is clearly to get back to playing the same sport at the same level as before the injury there are various factors that need to be integrated including expectations, confidence, relearning old skills and learning new skills. These need to be identified and discussed. We outline the main phases of returning to sport, coping with the mind of the athlete and discuss what has been learnt from analysis of why the female is more at risk of rupture of the ACL.

Four key factors

The factors are as follows and these need to be individualised.

a) Expectations

There may have been a long downtime between injury and finally undergoing surgery such that other events such as age, business or family commitments may alter the ability to get back to sport at the same intensity.

b) Confidence

It can take a long time for an individual to regain the confidence in putting their knee and their body in to such a situation where it may be reinjured again. For the footballer, for example, though they may get back playing at nine months, it may not be until a year after surgery before they have fully forgotten their knee. It seems to be a natural human tendency that after a while injuries are forgotten and the confidence seems to return.

c) Relearning Old Skills

Each sport can be broken down in to the specific drills and processes that are needed to perform well and these need to be identified along with the time intervals and goals before proceeding to the next specific skill. The phases follow a progression through regaining strength and then regaining functional knee control.

d) Learning New Techniques

Sometimes the reason why the ACL ruptured in the first place was because of a poor technique such as poor landing control after jumping, leading to buckling of the

knee. This is especially true for the female athletes who have a higher risk of rupturing their ACL as described in the next section. Individuals may need to unlearn some aspects of their sport and relearn new techniques in order to prevent reinjury.

Return to Sport Phases

For every sport the return to activity can be discussed under the following headings:

Understanding the specific skill of the sport
Ranking the specific skills by difficulty and risk to the knee
Drills and techniques to achieve each target
Understanding other activities that are safe to perform during rehab

Thank you.