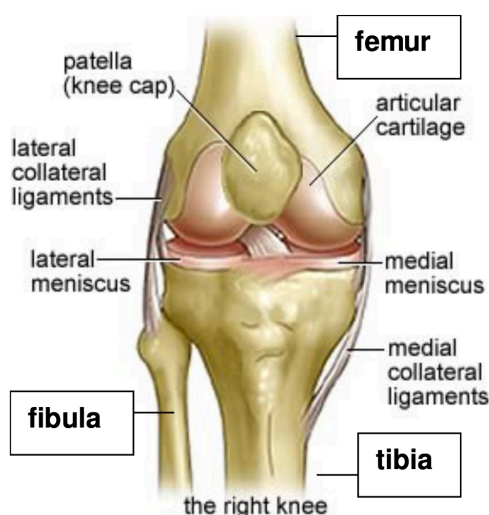


Patient Information And Rehabilitation Guidelines Following High Tibial Osteotomy Surgery

This booklet aims to improve your understanding of high tibial osteotomy surgery and the rehabilitation afterwards.

Anatomy

Osteoarthritis can affect any joint in the body but is more common in joints in the lower limb weight-bearing joints, eg hip and knee.



A joint is formed where two bones meet. The ends of the bones, which form the joint, are covered in articular cartilage.

This provides a smooth, slippery and low friction surface that also cushions the joint. Healthy cartilage absorbs stress and allows the bones to glide across each other smoothly.

Osteoarthritis

The word arthritis means joint inflammation. Also known as 'degeneration' or 'wear and tear' arthritis, osteoarthritis is the most common type of arthritis and develops over a long period of time.

It affects the articular cartilage, which can start to wear away. Sometimes this affects one side of the knee joint more than the other.

What is high tibial osteotomy (HTO)?

This is an operation, which aims to change the weight bearing forces that pass through the knee.

If you have osteoarthritis (wear and tear) and it only affects one side of the knee, it may be appropriate to have a HTO.

The operation is aimed at younger patients to avoid/delay total knee replacement. This is because total knee replacement does restrict activity levels and having one at a young age means it is more likely to wear out.

Benefits of surgery

Pain is usually the common complaint. This operation aims to reduce or get rid of the pain. It has a success rate of 70-90%. Other benefits include improved lifestyle and delay to full knee replacement.

Alternatives to HTO surgery

Alternatives to surgery include:

- Conservative measures, these include painkillers anti-inflammatories, using a walking stick.
- Kinespring implantation: the insertion of a shock absorber under the skin but outside the knee joint.
- A unicompartmental (or partial) knee replacement. This replaces the osteoarthritic side of the joint and replaces it with metal and plastic. This is still a knee replacement, it does **not** allow you to return to high impact activities (e.g. running). In younger patients it is likely to wear out and require revision.
- Total knee replacement. This remains an option but in younger patients it too is likely to wear out and require revision. It also will not let you return to high impact activities.

The procedure

The shinbone (tibia) is cut. A piece of bone is taken from the front of the pelvis and this bone graft is placed into the cut made in the shin. A metal plate (the AO Tomofix plate) is used to hold the cut tibia and bone graft in place. The knee can change position so that instead of the leg being straight it can look knocked kneed. This is normal.



Complications

Complications do occur. Some are minor and some require further surgery. It is important you understand this before proceeding with surgery. Examples include:

Complication	Recorded in literature	Professor McNicholas' cases
Anaesthetic risks (discussed with your anaesthetist)	Not recorded	Not recorded
Delayed bone healing	4%	4%
Fracture into the knee joint	4%	Not recorded
Superficial infection	3.4-7.1%	7%
Deep infection into the joint	4%	Not recorded

Knee stiffness	14%	Not recorded
Deep vein thrombosis (clot in the calf)	4%	Not recorded
Pulmonary embolism (clot in the lung)	1-2%	7%
Compartment syndrome	0-0.02%	Not recorded
Temporary nerve injury	2-25%	7%
Permanent nerve injury	4.7-14%	Not recorded
Reflex Sympathetic Dystrophy (abnormal pain reaction)	0.4%	Not recorded
Further surgery to knee	33% at 10 years 54% at 15 years	Not recorded
Conversion to total knee replacement	15% at 5 years 47% at 10 years	21% at 3 years
Donor site problems	20%	7%

If you smoke, you need to stop before the operation as continuing to smoke could cause the bone not to heal and increase risks of chest infection and clots in the leg or to the lung. You may be given an injection of blood thinner to reduce the risk of clot problems.

Any surgical intervention can theoretically result in mortality (death), it is extremely rare for this to happen for this procedure but recent legal rulings have mandated this be mentioned.

Pre-operative Assessment

An assessment of your fitness to undergo surgery including a detailed medical history, height, weight, blood pressure and pulse will be performed before surgery. Blood tests and a heart trace (ECG) may also be needed.

The Day of the Operation

You are asked not to drink or eat anything for at least 6 hours before your operation.

You will be seen by Professor McNicholas and your Anaesthetist before your operation.

In the anaesthetic room, you will have a needle put into your arm and will be placed on an anaesthetic machine.

Surgery usually takes around 1 hour.

You will wake-up in the theatre recovery room. On return to the ward you will have the following:

- Dressings – wool and crepe bandage on the knee and a splint
- Drips and drains – there may be small tubes in the back of your hand. You might also have a tube into your bladder (catheter).
- Analgesia – this may be oral medication or patient controlled analgesia (PCA), which looks similar to a drip.

You can be **discharged from hospital if progressing well, managing exercises, and safe on the stairs.**

Discharge Instructions

The wound is to be kept dry until healed and the dressing is not to be disturbed unless soiled and a clean one applied.

Regular ice application (10-15mins every 1-2 hours).

You will be given pain relieving medications to take home with you, please take these as prescribed to prevent pain from building up to a level that is hard to control.

Physiotherapy appointment arranged. Expect bruising in the thigh and lower leg.

Remember your scar is highly susceptible to the sun, and use of a higher factor sun block is advised.

General Advice

Return to work will depend greatly on the job that you do (desk-based jobs 2-4 weeks; manual jobs 6-12 weeks; jobs requiring ladders etc. 3-4 months).

Return to driving at 6 weeks for manual geared cars and automatic cars if it is the right leg that has been operated on. If it is the left leg that has been operated on, you may drive an automatic car once the wounds are healed at 2 weeks.

You should notify your insurance company of the procedure that has been undertaken to ensure that your cover is valid. For further information follow this web link: <https://www.gov.uk/driving-medical-conditions>

Flying is not permitted for 8 weeks following surgery due to a higher risk of developing a blood clot. For further information follow the web link below: <http://www.nhs.uk/chq/Pages/2615.aspx?C%20ategoryID=69>

Follow-up

You will be seen at 2 weeks, 3, 6, 12 weeks and 3, 6, 9, 12 months, 2, 5, 10 years annually after that.

6-12 weeks

An x-ray will be used to check if the bone is healing. If not, weight bearing may need to be restricted but this is very unusual.

12 weeks+

Another x-ray is used to see whether the bone is fully healed. If it looks satisfactory the crutches are no longer needed.

If the bone healing is very slow a special machine can be used to stimulate bone growth. This is done around 3-4 months after the operation.

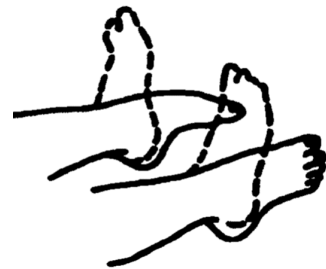
Rehabilitation (Physiotherapy) Programme

0-6 weeks

Using a plate called an A.O. Tomofix, you will have a splint on the first day until you can straight leg raise, then no splint would be needed. You may weight bear as tolerated and movement of the knee is allowed. You will probably need elbow crutches for 6-12 weeks.

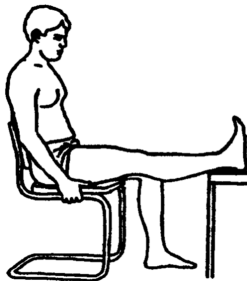
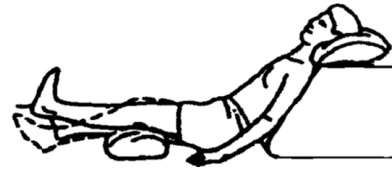
The following exercises need to be carried out 4 times a day.

1. Bend and straighten your ankles briskly. Repeat 10 times.



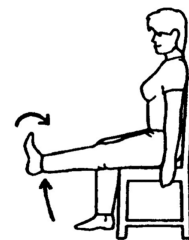
2. Lying on your back or sitting with legs straight. Pull your toes up towards you and push your knee down firmly against the bed. Hold 5 seconds. Repeat 10 times.

3. Sitting with back supported. Place a rolled towel under your knee. Pull your toes up towards you, straighten your knee and push it down against the towel. Hold 5 seconds. Repeat 10 times.



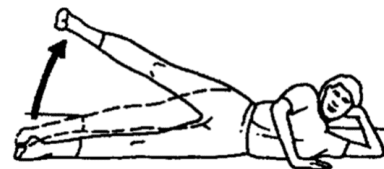
4. Sitting on a chair or bed with the leg to be exercised supported as shown. Use a rolled towel under the heel if sitting on a bed. Let your knee straighten in this position. Hold 5 seconds. Repeat 10 times.

5. Sit on a chair. Pull your toes towards you, tighten your thigh muscle and straighten your knee. Hold 5 seconds. Repeat 10 times.



6. Sitting on the bed place a sock on your foot. Place a slippery board/tray under your foot and a band around it. Bend your knee as far as possible. Gently pull the band to bend a little more. Hold 5 seconds. Repeat 10 times.

7. Lying on your side supporting yourself on your elbow. Roll top hip slightly forward, use top arm to support yourself in front. Keeping top leg straight lift it up towards the ceiling. Make sure the leg stays in line with your body and toes point forwards. Repeat 20 times.



VTE (blood clots)

VTE is a collective term for two conditions:

- **DVT** (deep vein thrombosis) – this is a blood clot most commonly found in a deep vein that blocks the flow of blood.
- **PE** (pulmonary embolism) – a potential fatal complication where a blood clot breaks free and travels to the lungs.

Whilst you are less mobile, especially during the first few weeks following your procedure, the risk of VTE is higher because of your immobility.

Professor McNicholas may prescribe you a daily injection of Clexane to help thin your blood and these should last approximately 14 days. If this is needed, you will be shown how to inject this drug yourself.

Symptoms:

- Swelling – you will have some swelling due to your surgery but if you have any concerns please call for advice
- Pain – any new pain we want to know about
- Calf tenderness
- Heat and redness compared with the other leg
- Shortness of breath
- Chest pain when breathing in

Things you can do to prevent VTE

- Move around as much as possible. Be sensible though, short and regular movement is best
- Drink plenty of water to keep yourself hydrated
- We strongly advise you not to smoke – this will have been discussed in pre op but we can also refer you to our smoking cessation team within the Hospital.
- Move your ankle around as much as possible to keep your calf muscle pumping

Small preventative measures can have a huge impact on your recovery.

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Date last reviewed: April 2016