FEMORAL AND TIBIAL OSTEOTOMY

This information sheet provides information on the nature and purpose of the procedure in addition to an outline of the post-operative rehabilitation.

Purpose and description of the procedure

This operation is a correction to the alignment of the leg, e.g. for a bowed leg or knock kneed leg, by cutting through the bone (osteotomy), changing the shape and holding it with a plate and screws. Wear in the medial (inner) compartment of the knee is treated by an opening wedge osteotomy made in the upper inner part of the tibia. This corrects slight bow legged alignment shifting the weight onto the well preserved lateral outer half of the knee. If there is wear or damage in the outer lateral compartment of the knee then an opening wedge osteotomy of the thigh bone is performed from the outer side, again shifting the weight off the damaged side of the knee. A plate and screws hold the position while the gap gradually fills in with bone over 2-3 months.

Illustrations of what the surgery involves are given at the end of this information sheet.

Indication

The operation is performed when there is early wear in one side of the knee in order to slow down the wear and to ‘buy time’ for the knee. It is also performed in certain ligament injuries where instability of the knee is associated with bowing of the leg.

Pre-operative preparation

Preoperatively in outpatients alignment x-rays of the whole of both legs are taken to help determine the exact amount of correction required. A hinged knee brace is ordered which will support the leg while the bone heals and yet it will allow some early range of movement exercises.

During the Hospital stay

On the day of surgery the leg is marked and final consent obtained. The procedure is usually performed under general anaesthesia and the anaesthetist will discuss post-operative pain relief. This will usually involve nerve blocks, which keep the leg and knee numb for a while, and analgesic tablets.

After the operation the leg is initially held still in a knee brace and depending on progress, gentle bending of the knee and walking with the aid of crutches is started on the first or second day. Most patients are able to go home on day 2 or 3 following surgery, with a date for removal of stitches or skin clips (usually 10 days) and an outpatient appointment (usually 6 weeks) when an x-ray is taken.

Post-operative care for isolated osteotomy without cartilage repair surgery

First Phase (up to 6 weeks)

This is directed at regaining range of movement and reducing the swelling combined with patella femoral mobilisation to reduce scar tissue.

The second phase of rehabilitation from six weeks onwards is directed at building up strength in the leg while the area of bone regrowth becomes stronger. After three months functional activities can be introduced.
0 – 6 weeks

**Knee Brace:** The knee brace should be used at all times when moving around for the first 6 weeks to protect the osteotomy site. For the first 3 weeks it is best for comfort reasons to lock the hinges when moving around but after 3 weeks it is safe to leave the hinges unlocked to help regain free bending of the knee. The brace may be removed at night as comfort and confidence allows.

**Weight bearing:** Weight bearing as tolerated is allowed in the brace with the aid of crutches and it is usual to use the crutches for the first 6 WEEKS.

**Exercises:** Early physiotherapy is directed at static quadriceps and hamstring work maintaining muscle bulk. Range of movement exercises aim to achieve a comfortable 90 degrees bend and full straightening (extension) of the knee by 3 weeks and nearly full flexion by 6 weeks.

Exercises allowed up to six weeks include supine knee flexion exercises sliding heel on a bed or board (closed chain exercises only), spinning on a bike without load, patella mobilisation (superior, inferior and medial/lateral), straight leg raising and static quadriceps/hamstring exercises. $90^\circ$ flexion is expected by three weeks and $110^\circ$ by six weeks. Further flexion can be pushed after six weeks assuming the bone has healed.

Exercises that are not advised before six weeks include bridging, prone lying with forced knee flexion, open chain extension exercises over a towel and anything putting excessive load across the osteotomy. In the position of prone lying the weight of the tibia is too excessive for the torsional loads on the plate and this position must be avoided.

6 weeks onwards

**At the 6-week follow-up appointment** X-rays are taken and, if satisfactory, the brace is removed. Free full weight bearing is allowed.

**At 6 weeks** when full weight bearing is allowed then proprioception and strength work using bicycle and rowing machines can commence. Exercises would now include strength work building up load on the bicycle progressively taking full weight on the leg and starting low load open chain exercises.

Function gradually increases, tailored to each patient, with the expectation of fast walking by 3 months building up to running and sporting activities at five to six months post surgery.

**Post-operative care for osteotomy combined with cartilage repair surgery**

The management plan is altered if there is arthroscopic surgery performed at the time of osteotomy to repair the joint surface and this will need to be discussed with the surgeon.

- Weight bearing is restricted to touch wt bearing only for the first 6 weeks.
- Range of movement exercises are encouraged to mould the new surface.
- The overall timetable is much slower, expecting a build up to sport after 6 months rather than 4 months.
Fig 1 Overview of tibial osteotomy showing the plate and 4 screws

Fig 2 Overview of femoral osteotomy where the plate is inserted from the lateral side of the leg

Fig 3 Diagram of alignment and planning of required correction for tibial osteotomy in a bow leg

Fig 4 Creation of the partial cut in the thibia using osteotomes prior to opening of the ‘wedge’ and insertion of plate

Fig 5 Insertion of the wedge opener to shift the alignment of the leg. The position is checked and the appropriate plate inserted.