

CORRECTIVE OSTEOTOMY

Information for Patients

WHAT IS CORRECTIVE OSTEOTOMY?

An osteotomy is a surgical procedure that involves dividing a bone at a selected site to create an ‘artificial fracture’, and fixing it in a corrected position. It is used to correct axial and torsion deformities and length discrepancies in the lower limbs. Osteotomies are also performed in the upper limbs, pelvis and spine, but much less frequently than in the legs. By corrective osteotomies of long bones in the leg, we try to achieve balanced distribution of weight in a healthy weight-bearing joint, or shift the load from those parts of a joint that are already damaged. Corrective osteotomies are most often performed to correct the distribution of forces across the knee when only one side of the joint is damaged (unicompartmental arthritis). Contraindications for the procedure are osteoarthritis of the entire joint or its major part, looseness of its ligaments, or inflammatory joint disease. When necessary, a corrective osteotomy may be combined with other procedures, such as ligament reconstruction or joint surface restoration.

WHAT ARE THE BENEFITS OF HAVING A CORRECTIVE OSTEOTOMY?

A corrective osteotomy involves dividing a bone (using a saw, drill or chisel) in a controlled manner according to a preoperative plan, and then fixing it in a better position. When an osteotomy is undertaken while the adjacent joints are still healthy, the function of such joints is expected to remain normal for the rest of the patient’s life. If the procedure is done to shift the weight off a part of a joint that is already damaged, it can delay the onset of clinical symptoms of osteoarthritis and the need for further surgery by 10 to 15 years, provided that the proper indications are observed.

WHAT ARE THE POTENTIAL COMPLICATIONS OF A CORRECTIVE OSTEOTOMY?

A corrective osteotomy is rarely associated with serious complications. Thus the benefits of the procedure generally outweigh its risks. Complications can develop during or after the operation. The possible risks include the following:

- Delayed union or non-union of the osteotomy site, possibly due to smoking, a coexisting systemic disorder, poor blood supply, previous surgery etc. Such cases require prolonged rehabilitation or even additional surgery.
- Healing of the bone in an undesirable position may reduce the benefit of the procedure. In rare cases, this complication requires a reoperation.
- Fracture or loosening of internal fixation material is usually treated by reoperation.
- Impaired function of the adjacent joints and increased stiffness in operated joints may be consequences of prolonged swelling and excessive scarring within the operated joint. A similar complication can result from the impaired function of the muscles and ligaments in the operated region. The principal cause of stiffness is improper rehabilitation.
- Damage to major nerves or blood vessels can occur during the operation. Most of these complications are treated directly after their occurrence. Long-term impairment is possible but extremely rare.
- Increased pressure within a muscle compartment (compartment syndrome) is a rare but serious complication. It is treated by making incisions over the affected muscle groups, whereby loss of function due to necrosis is prevented or reduced.
- Postoperative bacterial infection is an extremely rare complication of corrective osteotomy, but it may have serious consequences. As a rule, it develops within a month after the procedure. It is prevented by maintaining strict aseptic conditions in the operating room. Just prior to induction of anaesthesia, you will also be given a prophylactic dose of antibiotics. An infection that develops after the operation is treated with prolonged courses of antibiotics, and it often requires additional surgical interventions. Treatment must start as soon as possible. Therefore you should return for a follow-up examination immediately if an infection in the operated region is suspected. You must not take any antibiotics until you are seen by an orthopaedic surgeon. Signs suggesting a bacterial infection in the operated region are an increase in redness, pain and swelling, and a thick discharge from the operative wounds.
- Corrective osteotomies increase the risk of blood clot formation (deep vein thrombosis, pulmonary embolism). With preventive measures (medication, injections of low-molecular-weight heparin, compression stockings, early mobilisation), blood clots occur in only about 1% of patients.

- Various complications connected with general anaesthetic (headache, nausea, vomiting, dizziness) or spinal anaesthesia (headache, lumbar nerve root damage, inflammation at the puncture site) are possible during the operation, but are generally rare and transient.

ARE THERE ANY ALTERNATIVES TO SURGERY?

If you decide against surgery, you can expect the pain and loss of motion in the affected joint to grow worse over time, which means that in the long term, you will need to use a walking aid and take pain medication on a regular basis, and that your joint may eventually need to be replaced. The operation cannot improve your general health. Therefore your deciding against it can have no fatal consequences.

HOW DO I PREPARE FOR SURGERY?

While at home waiting for the operation, it is recommended that you regularly carry out exercises to strengthen and stretch the muscles and reduce contracture about the affected joint. With stronger muscles, you will also make faster progress in your postoperative rehabilitation. It is important that you maintain or achieve your ideal body weight, since excessive weight significantly increases the risk of postoperative complications. Smoking also has a significant adverse effect on bone healing. Therefore, smokers are advised to give up before the procedure, or at least cut down as much as possible. Before going into hospital, you might also consider making some changes in your home that will make your return after the operation easier.

Before the operation, we will need the results of routine laboratory tests (blood count, electrolytes, urine, ECG, chest x-ray) and diagnostic imaging (X-ray, MRI, CT, bone scan). We will also need detailed information about your previous and current illnesses, possible allergic reactions, your current medication, smoking history etc. A preoperative plan for the procedure is prepared on the basis of radiographs.

WHAT HAPPENS ON THE DAY OF SURGERY?

You will be admitted the day before your operation. You should bring your health insurance card and a referral note and findings received from your GP to the hospital. You will be asked to sign a consent form for anaesthesia and surgery, and you will meet your surgeon, who will answer any questions you may have. You will fast (have nothing to eat or drink) for at least six hours before the procedure. In the morning of the day of surgery, you will take only those of your regular medications that have been approved by your doctor. You will be asked to remove all jewellery, and you will take a bath or a shower. During the morning ward round, as a safety precaution, the doctor will mark the lower limb on which the operation is to be performed.

A nurse will take you to the operating suite and leave you with the anaesthesia team. An anaesthesiologist and a nurse anaesthetist will check your identity and prepare you for the operation. A corrective osteotomy is performed in the operating room under general anaesthetic, with the patient fast asleep, or under regional anaesthetic, which numbs the lower half of the body.

HOW IS THE OPERATION PERFORMED?

The operation lasts 60 to 120 minutes. During the procedure, a special cuff (tourniquet) may be applied above the surgical site, temporarily blocking the blood supply to the area. In some patients, arthroscopic examination of the adjacent joints must be performed before the osteotomy to assess the condition of the articular surfaces and other structures. On the basis of arthroscopic findings, the surgical plan may be modified if required.

Depending on the location and type of deformity, correction can be accomplished during a single operation, or it can be achieved gradually (e.g. by lengthening the bone by 1mm daily). The bone is fixed in the corrected position using internal (plate, screws) or external devices (external fixator frame). During the operation, x-rays are frequently used to check the position of the bone and the fixation devices. In rare cases, a cast or brace is applied to the operated limb for additional protection. In some types of osteotomy, a piece of bone (removed from the patient's pelvis or obtained from a bone bank) or artificial material is added over the osteotomy site to promote healing.

HOW LONG WILL I BE IN HOSPITAL?

The length of the hospital stay depends on various factors. If there are no complications, most patients are discharged five to seven days after the procedure.

After the operation, you will be transferred to the intensive care unit or directly to the ward, depending on the extent of the operation and associated conditions. You will receive infusions of fluids, pain killers, and periodically also antibiotics and anticoagulants to protect you from infection and deep vein thrombosis. Over the next days, your pain medication will be gradually reduced, so that by the time of discharge, you will be taking it only in the form of tablets.

The operation will be followed by prolonged rehabilitation, which must enable and ensure adequate healing of the bone, preservation of mobility in adjacent joints and prevention of muscle weakness. Patients usually use crutches during this period to avoid putting weight on the operated limb. Your postoperative recovery will depend on the type of osteotomy performed and its location. The details will be explained to you by your surgeon and physiotherapist. During your hospital stay, your wound dressings will be changed regularly, and blood tests will be carried out when necessary.

WHAT DO I DO AFTER DISCHARGE FROM HOSPITAL?

After you leave hospital, further dressing changes will be done by your GP, who will also remove the sutures 10 to 14 days after the operation. You will continue to take painkillers when needed. Patients with increased risk of deep vein thrombosis will need to continue taking anticoagulants in the form of tablets or self-administered injections for another 10 to 14 days.

After returning home, you will continue to do exercises, put ice on the operated area, and walk with crutches. If necessary, you will be referred for outpatient physiotherapy. Once the osteotomy site has healed sufficiently to allow full weight-bearing (6 to 12 weeks after the procedure), we will instruct you to stop using your crutches. At this stage, you may be referred for intensive supervised rehabilitation, depending on your needs.

Follow-up examinations at the orthopaedic outpatients' clinic are performed 1, 2, 4, 6, and 12 months after the operation. Further follow-up appointments may be scheduled if necessary.

You can start driving once the pain has cleared up, muscle strength and mobility in the adjacent joints have been restored and full weight-bearing is allowed, which is generally between 8 and 12 weeks after the operation. The same restrictions apply to light daily activities and tasks related to your job. A return to heavy manual work is possible four to

eight months after surgery. Sports activities can be resumed after four to six months, depending on the type of activity and type of osteotomy. For more precise time frames, consult your surgeon during the follow-up visits.

Surgical removal of the metal implants from the osteotomy site is generally performed one to two years after the corrective operation. The timing of this procedure varies with each patient.

WHO SHOULD I CONTACT IN CASE OF DIFFICULTIES AFTER DISCHARGE?

Should you have any kind of difficulties after leaving hospital, first consult your GP or, outside regular working hours, the doctor on duty at your community health centre. When seeing a doctor, always bring your discharge summary from the hospital. In case of a major complication, your doctor will arrange an urgent appointment with an orthopaedic surgeon. If bacterial infection is suspected, you **must not** take any antibiotics before seeing an orthopaedic surgeon.

While wearing a cast, you should pay attention to any pressure and swelling under the cast; this is manifested by severe pain, tingling, and inability to move your toes. If you have any of these symptoms, you should go to the emergency room **immediately**, where your cast will be split lengthwise to relieve the pressure.