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# HINDFOOT AND MIDFOOT OSTEOARTHRITIS TREATMENT

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## DEFINITION/DEVELOPMENT

The foot consists of 26 bones, all of which have joint connections to one or more adjacent bones. In principle, osteoarthritic changes can occur on any joint surface of these bones. Osteoarthritis means the wear and tear of the joint cartilage up to the complete loss of cartilage. As the bone attempts to adapt to the changed joint situation, bone attachments ("spurs, overbone", so called osteophytes) often occur in the course of the development of osteoarthritis. As the osteoarthritis progresses, the joint increasingly stiffens.

This process is usually accompanied by variable, stress-dependent, painful inflammatory reactions in the joint with swelling.

The causes of osteoarthritis of the foot and ankle are manifold. For example, osteoarthritis can be caused by malpositioning after bone fractures and ligament injuries, circulatory disorders of individual bones, metabolic diseases (e.g. gout) or rheumatic diseases. Depending on the congenital shape of the foot, overstraining certain joints can also lead to osteoarthritis in these joints in the course of life.

In most cases, however, it is an idiopathic osteoarthritis, which means that no actual cause for the development of the osteoarthritis can be found.

## SYMPTOMS

Most patients complain of pain in the region of the affected joint, although the patients themselves usually cannot localize the affected joint exactly. Typical osteoarthritis symptoms are initial pain and pain that increases on/after stress. Occasionally, pain at rest can also occur. Patients with hindfoot and midfoot osteoarthritis usually do not feel the restriction of movement, as they usually develop very slowly and the affected joints have a very limited range of motion anyway. The only exceptions are the talonavicular joint and the subtalar (lower ankle) joint. These two joints are mainly responsible for sideway movement of the foot.



Fig. 1: Sidewise movement with normal subtalar joint and talonavicular joint

For the other joints, the range of motion is small. Subjectively, one normally does not perceive this movement.

## EXAMINATION

The examination sometimes reveals a swollen joint with noticeable thickening of the bone and occasionally diffuse redness. Movement is painfully restricted. The normal rolling of the foot when walking barefoot is often no longer possible. Often the gait pattern is changed due to the pain. One begins to limp. This can lead to incorrect weight-bearing of the whole leg with pain in the knee, hip and lumbar spine.

After the clinical examination, an x-ray of the foot (rarely also of the healthy foot) must be taken.

The extent of the osteoarthritis (narrowing of the joint space) and the osteophytes (bony attachments/spurs) can be estimated on the x-rays. Due to the sometime difficult anatomical conditions, not all joints can be clearly depicted and adequately assessed. For this reason, we carry out an additional radiological examination, a so-called SPECT-CT, to assess the exact changes in the individual joints. The SPECT-CT can also be used to assess the activity of the osteoarthritis. At the same time, we can also use the images to make a statement about possible beginning osteoarthritis in joints that are still pain-free.

Images using the example of talonavicular osteoarthritis:



Fig. 2: X-ray image of talonavicular osteoarthritis



Fig. 3: X-ray image showing talonavicular osteoarthritis



Fig. 4: Spect CT of talonavicular osteoarthritis

### **Diagnostic Test Infiltration**

Before initiating further treatment of the joints affected by osteoarthritis, in certain situations we carry out an infiltration (injection) of the affected joint. This infiltration takes place under x-ray control to ensure that the correct joint is infiltrated.

The test infiltration can confirm the suspected diagnosis of symptomatic osteoarthritis. In addition, it also allows the potential effect of the surgery to be assessed. Depending on the issue, a local anaesthetic with or without cortisone is used.

## **TREATMENT**

### **B) Surgical**

If the osteoarthritis is already advanced or conservative treatments have been unsuccessful, surgery is a sensible treatment. On the hindfoot and midfoot, we usually perform a fusion (arthrodesis) of the affected joint. In this situation there is often already an almost complete spontaneous stiffness. The change is therefore hardly noticeable to the patient after the operation. An exception is the talonavicular joint. Here, before a fusion, the possible additional restriction of movement must always be pointed out.

In the case of osteoarthritis, the joint is opened and the remaining cartilage and underlying bone are removed, allowing the position to be corrected. The bones are then fixed in the desired position. This is done with screws and plates (osteosynthesis). Occasionally, additional bone replacement is used to bridge defects and/or support bone healing. With this internal fixation the two bones can grow together in the following weeks. With every fusion, the foot must be immobilized in a plaster cast or special shoe for several weeks after the operation, and the affected foot must not be fully weight-bearred during this time (usually 6 weeks). A load of 15-20 kg is the rule. With the help of crutches, mobility is largely maintained during the first 6 weeks. After that, the weight-bearing may be increased gradually, whereby a special shoe is often required to protect the fusion until full weight-bearing is possible again. After about 3 months, own shoes can be worn again. Only from this point on is it possible to assess whether shoes or special insoles are necessary.

One consequence of fusion is the partial or complete takeover of mobility by the adjacent joints. In the first few months, this additional weight-bearing can cause discomfort or uncertainty when walking. However, these problems usually disappear completely. Over the course of several years this additional weight-bearing can lead to osteoarthritis of the adjacent joints. Before performing fusion of a joint, the condition of the adjacent joints must therefore also be assessed. This allows preexisting damage to be taken into account when planning the operation.

**Your scheduled surgery:**



Fig. 5 and 6: Foot x-ray images

Fusion	Subtalar joint	Talonavi- cular joint	Calcaneo- cuboid joint	Lisfranc (tarsometatar- sal) joints
Normal walking	↔	↔	↔	↔
Walking in uneven terrain	↓	(↓)	↔	↔
Climbing stairs	↓	↓	↓	↔
Race/Jogging	↓	↓	↔	↔
Swimming	↔	↔	↔	↔
Fitness	↔	↔	↔	↔
Driving a car	↔	↔	↔	↔
Cycling	↔	↔	↔	↔
Skiing	↔	?	↔	↔
Cross-country skiing	↓	↓	↓	↔

**RISKS AND COMPLICATIONS**

Complications and risks may occur during or after the operation and delay the healing process or make further surgery necessary. They can never be completely ruled out during an operation, even if they are rare during foot surgery. These are summarized below:

- Vascular injuries, secondary bleeding, bruising, blood loss
- Nerve injury
- Non Union (lack of bone healing)
- Failure or interference with implants (screws, plates)
- Thrombosis, embolism
- Residual complaints

**FOLLOW-UP TREATMENT**

The operation is only a part of the whole treatment. The post-operative treatment plays a major role in the success of the surgery. It is important that you know what you should observe and possibly avoid.

### **Dressing and Wound Care**

During the time in the hospital you will be shown how to care for the wound. As long as the wound is not completely dry (wound secretion/blood) the dressing should be changed daily. Do not use ointments or powders directly on the wound surface as long as the stitches have not been removed! Disinfection is not necessary. Always remove the entire dressing when changing. The new dressing must be dry and must not slip.

If the wound is dry, a normal plaster (quick bandage) is sufficient. An elastic bandage can provide some protection and padding for the operated area. The remaining swelling is also reduced.

If you are not sure whether everything is normal, you can consult your family doctor or contact us directly.

The stitches can be removed about 2 weeks after the operation, usually by the family doctor.

### **Swelling and Pain**

After an operation the affected foot is always more or less swollen. This swelling can occur repeatedly over weeks (up to 6 months). The most effective measure is to elevate the leg. It makes sense to move several times a day (walking, less standing) but only for a short time.

If the foot tightens and starts to hurt, this is a sign to elevate the leg again.

Despite these measures, pain in the operated foot can occur in the first days and weeks after the operation. In contrast, you can take the pain medication prescribed to you.

### **Weight-Bearing**

The permitted weight-bearing of the foot depends on the operation performed. You have been given a special shoe or plaster cast to protect and facilitate mobility (Fig. 7). Depending on the operation, partial or full weight bearing was recommended



Fig. 7: Special shoe (Vacopedes/Vacoped)

### **Partial Weight-Bearing:**

You can put about 15-20 kg of weight on the affected foot. This is roughly equivalent to the weight of the leg and means that you must always use the crutches. To be able to do this correctly, you will be instructed by our physiotherapists. It is important that you are able to take a few steps on the stairs on your own with the crutches. The partial weight-bearing must be maintained until the first follow-up check with us approx. 6 weeks after the operation.

### **Personal Hygiene**

As long as the stitches are still in the wound, i.e. usually in the first 2 weeks, the operated foot should be protected with a plastic bag. The easiest way is to pull the plastic bag over the special shoe. As soon as the stitches are removed, you can shower and bathe without further precautions. If you have received a cast, it should be protected from water with a plastic bag.

### **Thrombosis Prophylaxis**

Thrombosis prophylaxis already begins during the hospital stay. Depending on the operation, this prophylaxis must be continued. In most cases we use Fragmin 5000IU ready-to-use syringes. They are administered once a day by the patient himself. You will be instructed by our nursing staff during your stay.

How long the injections have to be administered depends on the operation and the individual risks and is necessary until the patient can fully weight-bear or walk without crutches. This usually means 6-8 weeks.

### **Work Ability**

After an operation a resting phase is important. In the first 2 weeks you should take it easy and not work. How long you will be completely unable to work depends on the type of operation and on your stress profile. It is usually also possible to temporarily find a less stressful job together with your employer. This makes it possible to resume work at an early stage.

The signed work absence which you receive from us is a preliminary assessment. If you are still unable to resume work after this period, the certificate can be extended accordingly. If this is the case, please contact your family doctor or us.

If you feel fully fit for work again before this period expires, you can resume work before then.

**Driving a Car**

When you can start driving again depends on the type of operation. You must refrain from driving as long as you cannot fully weight-bear your foot or are still using crutches. The extent to which you are able to drive is at your own discretion. In case of doubt or uncertainty, we recommend that you leave the car standing.

**Check-Ups**

Six weeks after the operation, your surgeon will carry out an x-ray checkup. After that the further procedure will be determined. As a rule, you will be given a special shoe for the next few weeks to help build up the weight-bearing. Afterwards you can wear your own shoes again. We recommend shoes with rather firm soles and soft upper leather at the beginning.

About three months after the operation, most everyday activities can be resumed. Sporting activities should be increased slowly in order not to provoke an overload after the sports break.



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