

Tarsal Arthrodesis

What is tarsal arthrodesis?

Tarsal arthrodesis is the surgical fusion of the joints near the hock (ankle). Pantarsal (complete) arthrodesis includes the ankle and the joints immediately below it. Partial arthrodesis is fusion below the ankle i.e., ankle range of movement is essentially unaffected. Tarsal arthrodesis is indicated for severe traumatic injuries of the tarsus e.g., intertarsal/tarsometatarsal joint luxation, shearing injuries, unrepairable tarsal bone fractures and for debilitating tarsal osteoarthritis or degenerative ligamentous disease. With traumatic tarsal injuries, damage may occur at one or several levels of the tarsus. It is not always possible to accurately identify whether one or several levels are involved, particularly if there is severe disruption at one level and milder injury to another level or levels.

Treatment options

Two basic types of arthrodesis are performed in the tarsal region:

- Pantarsal arthrodesis (PTA) involves surgical fusion of all four joint levels of the tarsus: the talocrural, the proximal intertarsal, the distal intertarsal and the tarsometatarsal joints. Fusion of the talocrural joint results in a permanent alteration to gait as the ankle is fixed in position.
- Partial tarsal arthrodesis typically involves fusion of only the intertarsal and/or tarsometatarsal joints; movement of the talocrural joint (the major joint of the tarsus; our ankle) is preserved, and gait may be minimally affected or normal.

Tarsal arthrodesis is most commonly performed with bone plates, although pins & wires or external skeletal fixators may also be used. A bandage, splint or cast may be applied to protect the plates/pins and may be maintained for up to eight weeks. Alternatively, additional support may be provided by specially designed tarsal braces that are removable and secured with Velcro straps. Supportive bandages, casts, and braces can, however, result in significant complications, so in some instances, it may be preferable to minimise or even avoid external support. Complete tarsal fusion typically takes 12 to 16 weeks.

Outcome and potential risks of surgery

Whilst tarsal arthrodesis can achieve a good clinical outcome, high complication rates are frequently reported in the veterinary literature, and as many as 15-20% of operated cases may require additional surgery. The most extensive multi-centre study published in the U.K. reported complications in 75% of cases, with major complications in 32.5% of cases and minor complications in 42.5% of cases.

Various surgical complications are described, some of which are detailed below:

- Infection is relatively uncommon; strict sterile technique is used during the surgery and antibiotics are administered in the peri-operative period. Nevertheless, distal limb surgery is at greater risk of developing infection compared to mid and upper-limb surgeries, and particularly invasive surgeries such as arthrodesis further increase the likelihood of infection. Contamination of the wound in the early postoperative period may increase this risk e.g. your dog licking the wound in the days/weeks after surgery will increase the risk of infection. Should an infection occur, early detection and treatment may result in rapid resolution, although removal of the implants may be required once the bone has healed. More serious problems may occur if infection progresses untreated or if your dog suffers infection with multi-resistant bacteria e.g. MRSA.
- Plantar necrosis was the most commonly reported major complication (15 per cent of cases) in the aforementioned study. Skin and deeper tissues may necrose (die) resulting in loss of skin, pads, and even digits. In the most severe cases, limb amputation may be the only viable management option.
- It may be difficult to achieve completely normal alignment, particularly after traumatic injuries and especially chronic traumatic injuries/malunions; a small degree of rotational and/or angular malalignment is not uncommon.
- Excessive early activity increases the risk of damaging or breaking the plate or screws, or fracturing bones

(especially the metatarsal bone at the lower end of the plate).

- Bandages, splints, and casts not uncommonly result in pressure sores. The likelihood of pressure sores developing is reduced (but not eliminated) by strict confinement.
- Pressure within bandages/splints/casts may rarely increase enough to restrict blood supply e.g. limb swelling resulting in a "tighter" cast. If the blood supply is restricted for long enough it may result in loss of skin, digits or even the entire bandaged portion of the limb. Regular monitoring (e.g. squeezing toes and assessing response morning & evening) minimises the risk of this rare but potentially catastrophic complication.
- Fusion of the tarsus may be delayed, prolonging the period of confinement necessary.
- Some areas of the tarsus may fail to fuse, which may cause persistent lameness. Further surgery may be required to resolve this problem.
- Irritation from the plate not uncommonly necessitates plate removal. The presence of the plate also increases the risk of distal metatarsal fracture; plate removal may be advisable once the tarsus has completely fused.
- Even after the bones of the tarsus have started to fuse it is still important to have a controlled, gradual increase in activity, similar to human patients undergoing rehabilitation. If activity in dogs is increased too quickly after surgery disruption of the fusing bones may occur. Straining of the weakened soft tissues (ligaments, tendons, joint capsule and muscles) is an additional risk.

Postoperative care

A pad may be covering the wound at the time of discharge from the hospital. This can be removed after several days, or immediately if soiled. Medications e.g., Pain killers will be dispensed.

It is important to try to reduce swelling of the operated limb following surgery with regular cold treatment (flexible sports ice packs are ideal). Apply **Ice packs** for 10 to 15 minutes as frequently as possible (within the first 24 hours 2 to 3-hour intervals are ideal during waking hours) for 3 to 4 days following surgery to reduce swelling and improve comfort. Regular, gentle massage (sweeping motions from ankle to hip) may help dissipate oedema fluid.

If a bandage/splint/cast has been applied, monitoring is crucial (see aftercare sheet). Splinted bandages should be changed at **3 to 7-day** intervals. Frequent checks with your Vet should be performed for casts and splints.

Your dog should be kept confined to **eliminate running and jumping** for at least the first 8 weeks: a single room with non-slip flooring and no furniture may be sufficient, however, a large cage is advisable. Short leash walks in the garden (a few minutes four to six times daily) are recommended initially to allow toileting.

- Four weeks following surgery: commence lead walking for 5 minutes at a time, two to three times daily.
- Six weeks following surgery: increase lead walking to 10 minutes at a time, two to three times daily.
- Maintain confinement **at all other times**; running, jumping and playing should be avoided for 4 months.

X-rays should be performed six to eight weeks following surgery to assess implants and the degree of healing. Further X-rays are typically taken at 12-14 weeks +/- 16-18 weeks post-surgery.

Declaration

I have read the information contained herein and am satisfied I have a sufficient understanding of tarsal arthrodesis, including potential complications that may occur and requirements for aftercare following surgery. I hereby consent for my dog to undergo tarsal arthrodesis.

Owner's name:

Dog's Name:

Owner's signature:

Date: