

ARTHRODESIS AS A SALVAGE PROCEDURE:**Some joints don't mind, others do.****Synopsis-- Anatomy and the Disease**

A catastrophic loss of joint stability requires intervention for (near-) optimal return to limb use. The most commonly injured joints are the small ones—carpus and tarsus—and they are also the most accepting of a fusion to achieve good function.

Joint instability may develop in any of the four planes around the joint, or most commonly, multiple planes-- medial, lateral, cranial (dorsal), caudal (palmar/plantar). Finding out which of these has lost its ligaments is achieved remarkably well with stressed radiographic views (see blog topic for technique-- <https://directvetsurg.com/stressed-views-may-2018/>) Any “soft tissue” ruleout listed after taking radiographs of the carpus or tarsus can be fine-tuned with stressed views! Knowing which areas have been injured and to what extent is essential for treatment planning.

Not all carpal/tarsal luxations are optimally or essentially treated with arthrodesis. Select injuries can be primarily repaired and then externally supported. Some patients can be managed with careful use of professional orthotics alone. Patient size, activity expectations, age and client motivations and abilities all play into the treatment plan.

When arthrodesis is chosen, the client expectations need to be clear. An arthrodesis needs external support (either medical splints or custom orthotics), and “bandage management and compliance” is a lot of work! Three to four months of daily attention and weekly veterinary visits is the norm. Implant removal is a common necessity after full healing. Normal leg function is rarely an outcome; comfortable leg function with functional lameness IS a realistic outcome.

The other/larger joints what have arthrodesis techniques described are the stifle, elbow and shoulder. None of these are highly successful, and careful patient selection and client preparation are essential for these rare cases.

Surgical Overview:

The goal of an arthrodesis is to eliminate the cartilage surfaces of a joint such that the bones on either side fuse/heal together just like a fracture heals. Just like a fracture, rigid fixation is essential to eliminate macro- and micro-movement associated with non-union. Most commonly this is achieved by surgically debriding the joint cartilage, packing the intervening space with synthetic or autologous graft and internally immobilizing with a combination of plates, screws, pins and wires. Because these are locations that were designed to bend, biomechanical loads are tremendous; external coaptation is essential to support the internal fixation toward a full fusion. Healing times range from six to twelve weeks or more.

The **indications & rationale** for surgical treatment are:

- Loss of significant ligamentous/retinacular support structures of a joint such that gross joint instability is apparent
- Intractable degenerative joint disease/osteoarthritis
- Complex intraarticular fractures

- Pancarpal/pantarsal versus selective partial carpal/tarsal arthrodesis is determined by careful palpation and review of stressed view radiographs

Other options for treatment (besides surgery) are:

- Custom professional orthotics for treatment in select cases may be successful
- Permanent use of well-tolerated custom orthotics can be a successful option

Supportive/ancillary options with surgical treatment are:

- Given the long wear times for postop external coaptation, use of custom professional orthotics in many cases may improve patient and client (and staff!) experiences.
- Lifestyle modifications to accommodate a reduced stress load on front limb (primarily)

The **perioperative experience** for pet and owner includes:

- Frequency and severity of negative experiences are directly related to degree of arthrodesis (i.e. panarthrodesis more challenging than partial arthrodesis)
- Frequent bandage changes preop and postop (6-12wks) --or--
- Custom orthotic molding/fitting visits preop and postop and ongoing home management daily
- Strict activity restriction (10-16wks)
- Limb function restricted by loss of joint movement, characterized by altered gait/functional lameness

Expectations for outcome are:

- Comfortable fusion with functional lameness
- Experiencing some complications is likely.

Complications that may arise with this procedure are:

- Bandage related skin complications (minor to major, requiring frequent veterinary visits or procedures)
- Wound complications (minor to major, requiring frequent veterinary visits and/or procedures)
- Implant complications (commonly requiring subsequent removal)
- Surgical infections (minor to major, requiring long-term antibiotics)

Postoperative **outcomes may be poor** due to the above complications, and/or:

- Other, unrelated arthropathies or disabilities
- Progressive breakdown/instability of adjacent (intercarpal/tarsal) joints

What a surgeon needs prior to surgery:

- Affected leg/body part “marked” by owner for confirmation (wax “costume makeup” works well)

- Skin near the surgery site CLEAR of infection (papules, pustules, crusts, collarettes, etc.) If urgent surgery, owner must be alerted to *increased risk* of incisional, deep and/or implant infections.
- Plan for external coaptation (if custom orthotics, relationship/communications established with orthotist and plan in place.)

General considerations and complications for all surgery/anesthesia procedures are:

- *Difficult and/or painful anesthetic recovery (variable; may require additional medications or re-hospitalization)*
- *Incisional infections (rare, minor; usually require oral antibiotics)*
- *Incisional dehiscence (rare, minor or major; may require surgical revision)*
- *Adverse anesthetic event (rare, major; may result in serious impairment or death)*

Proper owner expectations are important to a successful experience and patient outcomes. Please discuss this information with your clients while assisting them with decision-making for **Arthrodesis**.

Resources:

- Whole Pet Orthotics and Prosthetics <https://www.wholepet-op.com/>
- Twin Cities Animal Rehab <http://www.tcrehab.com/>

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