

**SALTER FRACTURES:**

**When the young are broken, timely repair and proper expectations.**

**Synopsis**

Physal fractures are those that occur through or across (or through and across) the growth plates of longbones in puppies and kittens. They are numbered, in order, to make communications and medical records referencing radiographic findings more easily understood. The order roughly corresponds to prognosis as well, but that is certainly colored by other factors such as bone, age, open/closed, species, etc.

Physal fractures are usually repaired with non-threaded implants to prevent overly restrictive stabilization—the physis needs to keep growing during/after repair. If or when it doesn't, more orthopedic problems result. The repair is best achieved within days; this optimizes the health of the injured physal cells and minimizes the development of orthopedic problems.

**Type 1:** fracture is right along the physis; epiphysis separates/slides from metaphysis

**Type 2:** fracture is along the physis except it takes a corner of the metaphysis with it too

**Type 3:** fracture is part-way along physis and then breaks right through the epiphysis (into the joint)

**Type 4:** fracture is at a right angle to the physis breaking through the epiphysis (into the joint) and taking a corner of the metaphysis

**Type 5:** fracture is actually a crushing of the physis; rarely appreciated on radiographs initially, usually presumed retrospectively

Complications that may arise with this procedure are:

- **Implant migration**—given that the bones are soft, youngsters are active, and implants are not threaded, implants will migrate (*common*; usually requires implant removal, often with brief anesthesia)

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

- **Premature closure** of physis—Bone length will be compromised if the physis closes along its full width; length discrepancy will be more dramatic when fracture occurs in younger patient. Predicting this may allow for prophylactic leg lengthening opportunities.
- **Assymmetric closure** of physis—assymmetric bone growth results in curvatures of varying degrees; ranges from cosmetic to disabling; a younger patient has more time to develop more dramatic abnormalities.

What a surgeon needs prior to surgery:

- Patient signalment and radiographs (or accurate description of same)
- Patient in appropriate splint pending surgical stabilization (to prevent further physal, fracture and joint disruption)
- 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.

**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 **Salter fractures in puppies and kittens**.

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