EXTERNAL SKELETAL FIXATION IN CATTLE: 
INDICATIONS, TECHNIQUES AND OUTCOME ASSESSMENT
Susan R Vogel, DVM
Université de Montréal, Faculté de médecine vétérinaire
St-Hyacinthe, QC Canada

Key Points

- Avoid placing implants in metaphyseal bone when possible, especially in young animals
- Limb swelling is common in Type II external skeletal fixators and also occurs in limbs that are casted after being suspended for orthopedic surgery
- Using more, smaller diameter, smooth pins for transfixation pin casts inserted by impact hammer may increase the time an animal comfortably spends in a pincast
- Cast disease can be detected by subtle radiographic changes between the limb and cast

Factors to consider when choosing an external skeletal fixation system include age of the animal, type and size of implants used, insertion techniques and implant location. Outcomes and complications can be monitored by radiographs and patient comfort while at rest and walking.

Young bovine orthopedic patients have very soft bones and are predisposed to implant loosening before fracture healing. Because the implants are stronger than the bone, implant failure is rarely seen. However, in adults, implant and/or bone failure are potential complications in addition to implant loosening. Clinically, it has been observed that metaphaseal bone, especially in young patients, is inferior to diaphyseal bone for transfixation pins. It is recommended to avoid it, if possible, as it seems to offer little resistance to implant bending and loosening.

Type II external skeletal fixators are used when casts cannot be applied because of open and contaminated wounds. The swelling that occurs in the operated limb can be impressive and adequate space should be left to accommodate the swelling without compromising the stability of the construct.

It has been brought into question the use of only 2 larger diameter, threaded pins for transfixation casts as pin loosening, patient discomfort and catastrophic failure have been seen. Most recently, 3 smaller diameter, smooth pins inserted by hand with a hammer have been used with an increase in patient comfort, no evidence of pin migration or breakage, a decrease in peri-implant osteolysis and easier cast & pin removal.

With the patient in dorsal recumbency, the limb is best positioned for proper pin insertion and alignment. However, it is recommended to move the patient into lateral recumbency for cast preparation an application. This allows the vasculature of the limb to refill and avoids the problem of an overly tight cast due to limb swelling that can occur when a limb is casted after being suspended for an orthopedic surgery.

Radiographically, small changes at the bone-pin interface can be difficult to detect because of the presence of cast material. Patient comfort in the box stall appears to correlate with findings at cast removal. When cast sores are present, they can be detected on radiographs. A properly applied cast with no cast disease has a fine radiolucent line visible between the limb and the fiberglass casting material on a radiograph. When cast sores are present there is a loss of this fine line at the site of ulceration.