

Use of the Thomas Splint and Cast Combination, Walker Splint, and Spica Bandage with an Over the Shoulder Splint for the Treatment of Fractures of the Upper Limbs in Cattle

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KEYWORDS

• Thomas splint • Walker splint • Spica bandages • Fractures

KEY POINTS

- The use of splints has been a part of food animal practice for decades.
- Many proximal limb fractures can be successfully treated with splints in food animals.
- Thomas splint-cast combinations and Walker splints can be used in the field without specialized equipment.

INTRODUCTION

A review of records of cattle admitted to 10 veterinary medical schools for years 2003 up to and including 2012 discovered that 778 (2.3%) of 23,754 cattle were presented for fractures. There were 91 (11.7%) tibial fractures and 29 (3.7%) fractures of the radius (The Veterinary Medical Database [VMDB]. <http://www.vmdb.org/>. The VMDB does not make any implicit or implied opinion on the subject of this article.) These percentages are similar to those reported from a database review between 1985 and 1994.¹ Many methods have been reported for the treatment of cattle with fractures of the tibia that include casts, various splint-cast combinations, external fixation with transfixation pins, and internal fixation with orthopedic implants.^{2–9} Likewise, radius-ulna fractures have been reported to be treated by many of the same

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techniques.^{2-8,10} The treatment methods for tibial and radial-ulnar fractures overlap because the tibia and the radius are similar-sized bones and similarly located in the upper limb near thick muscle coverage.¹

For many years, splints, including the TSCC and Walker splints, have been an integral component of the bovine veterinarian's practice for treating orthopedic conditions in cattle. The TSCC and Walker splints have been used primarily for treatment of radial-ulnar and tibial fractures. Although the splints for large cattle can be technically challenging to construct and apply and some cattle wearing the splints may be difficult to manage, the splints have been used successfully in many cattle and small ruminants. Combined data from 3 separate studies evaluating the use of the TSCC for treatment of tibial fractures showed an 82% success rate in returning the cattle to production.^{3,4,11} This success rate compares favorably to the success rates for both internal fixation and external fixation with transfixation pins and casts. A search of the literature shows a lack of citations for the use of splints for fracture repair in cattle in the last decade (or two). This lack may not only reflect that methods of splint application have not changed, but also coincides with an increased emphasis on internal fixation for lighter cattle and small ruminants and increased use of transfixation pin techniques and stronger casting materials eliminating the need for a metal splint in lighter animals. Current casting material have enough strength to be placed up to the axilla or groin to provide support much like the ring of the TSCC and Walker splints for cattle, calves, and small ruminants weighing less than 200 kg, which simplifies application of external coaptation because a separate splint does not have to be constructed. Cast application and subsequent management can be less complicated and less expensive than some of the splint-cast combinations for selected cases. The use of transfixation pins with casts may provide a more stable construct than the TSCC or Walker splint but requires general anesthesia for pin insertion, technical expertise for pin application, and intraoperative imaging. Costs for treatment of fractures with transfixation casts are generally much higher as compared with treatment with a TSCC or Walker splint. Internal and external fixation techniques for repair of upper limb fractures are generally done in referral hospitals. Application of TSCC, Walker splints, and spica bandages and splints can be done in field situations. Splint-cast combinations are the treatment of choice for heavy cattle with fractures of the tibia, radius-ulna, or olecranon. These combinations are used in cases in which the animal is too heavy for current internal fixation techniques and/or the fracture is too high to be stabilized by cast or transfixation pin cast. Splint-cast combinations are also useful for treatment of highly comminuted fractures that would be difficult to reconstruct with internal or external fixation. The splint-cast combinations are also a good choice for cattle and small ruminants of all sizes when costs need to be minimized.

ASSESSMENT OF THE PATIENT AND FRACTURE

All ruminant orthopedic patients should be examined carefully to determine the nature and extent of all the injuries before starting treatment. The veterinarian should be sure not to apply a splint on a recumbent ruminant with an obvious tibia fracture only to learn later that the animal also has some orthopedic condition of another limb. Cattle are seldom able to stand and move around with a specialized splint if they were not standing on 3 sound legs before splint application. Mature animals, especially, may have difficulty standing up in a splint if they are recumbent before application of a splint. One rule of thumb to reduce complications after any splint application is that ruminant fracture patients should be able to stand on the other 3 legs and ambulate

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