Prehospital care of equine fracture patients

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The initial treatment of injuries to the equine extremity greatly affects the chances of perfect healing especially for long bone fractures [1]. Unfortunately, most fractures are exposed to substantial additional trauma during the transportation of the injured horse. Proper emergency equine transport, first aid and fracture splinting are critical to assure the best possible outcome.

Rescue of severely injured horses A specially trained large animal rescue team, operating in Switzerland and Liechtenstein, specializes in the rescue of large animals involved in automobile accidents or trapped in precarious situations (Fig 1). Depending on the circumstance, it may be necessary to use a rescue net and crane or a helicopter. Rescues efforts may be conducted in the upright, lateral or dorsal recumbency positions. Rescuing horses must be well planned and calmly executed under the supervision of an experienced equine veterinary specialist (Fig 2). Up to now no complications have been encountered during these rescue efforts. Although every rescue operation must be performed promptly, time is of secondary importance to the mental well-being of the horse. As flight is a horse’s only protective response, any injury preventing this activity represents mental anguish for the animal. Thus, hastily improvised rescue procedures will be inadequate and result in additional trauma. Optimal treatment includes: initial wound management, infection prophylaxis, proper analgesia, intravenous fluid therapy, sedation and possibly anesthesia, stabilization of the fracture and careful and safe rescue with proper transportation.

Transport of the injured horse in a supporting harness A harness which supports the horse’s entire weight and does not interfere with their respiration and balance should be used (Fig 3). It allows the horse to rest its limbs during transport, reducing anxiety and pain, and improves the general attitude of the patient. It is imperative that everything is checked repeatedly throughout the transport, so that problems can be immediately identified and corrected promptly. Most horses alternately rest one limb after the other. After some time, horses with a properly splinted fractured limb will frequently bear some weight on it while being supported by a harness, thereby resting the healthy contralateral limb.
For this type of transport, a person experienced in large animal rescue operations should always be present in the trailer to provide optimal care for the patient. In extreme cases, a veterinarian may be required to travel with the horse. Experience has shown that horses transported with a harness arrive at the hospital in much better general condition than those that are not.

If such a rescue sling is not available, the patient should be supported on all sides so the animal’s body weight leans against the wall or bales of straw placed on one side of its body (Fig 4). One has to keep in mind that the horse can neither see

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**Fig 2** A horse with an ulnar fracture is rescued with the help of a crane and lifted to the trailer, which could not drive to the injured horse because of the snow. After intravenous sedation, it took between 3 and 8 minutes to accomplish this rescue.

**Fig 3** A fracture patient supported by a harness is ready to be transported to a specialty clinic. A splint is applied to the limb to temporarily fix the fractured limb.

**Fig 4** A horse is standing in a trailer with its properly bandaged fractured limb. The left side of the trailer is filled with straw bales to build up a lateral support for the horse.
curves ahead of it nor the red lights suddenly appearing in front of the vehicle.

**Transport of recumbent horses**  Horses that are unable to stand are transported to the clinic in lateral recumbency, and if anesthesia is used, it must be induced and maintained by a veterinarian (Fig 5). Transportation is as rapid as possible (not to exceed 90 minutes) and requires that the veterinarian travel with the horse. The transportation may even require police escort. Equipment required for this transportation includes a mechanical or electric winch, transport mat and insulated air mattress. In order to maintain control of the horse’s well-being, an indwelling intravenous catheter is placed and intravenous fluids are started. To reduce injury for the recumbent horse, leather boots are placed on the hooves, and hobbles are applied to all limbs. After the halter has been removed to prevent damage to the facial nerves, the head and eyes must be well protected with padded leather headgear. The recumbent horse is pulled into the van using a slide mat. Recently, special air mattresses have been developed for the transport of recumbent horses and are used by the large animal rescue units in Switzerland and Liechtenstein. Before inflation the air mattress is placed between the horse and the transport mat, which are then pulled into the van. Once the horse is in the trailer the mattress is inflated with compressed air in about 2 minutes and assures a comfortable ride for the patient. Horses can be transported great distances without the risk of pressure necrosis or nerve damage. Often, the amount of drugs used to sedate the horse can be reduced.

An audio-video system between the van driver and the assistants in the trailer helps to ensure the safety of the personnel accompanying the horse. For long distances, the use of a mobile anesthetic machine operated by experienced assistants may be necessary. This enables the administration of intravenous fluids and supplemental oxygen (approximately 2–12 l of oxygen per minute). Unloading the recumbent horse

**Fig 5**  A recumbent patient was pulled into the trailer and rests comfortably on an air mattress. Two assistants help with anesthesia.

**Fig 6**  Left: A drawing of a horse suffering from a proximal radius fracture, demonstrating the muscle induced valgus deformity. Right: The limb is properly supported with layered bandage up to the elbow and an additional lateral splint to the shoulder, effectively counteracting the deforming forces.
is achieved by pulling the transport mat out of the van with a winch, crane or by hand. It is important to keep track of all the types, quantities and concentrations of the medications the rescue team administered to the patient and to hand this information to the treatment team at the specialist hospital. As a rule only fracture patients with open fractures and those that cannot stand up are treated immediately by means of internal fixation. The vast majority are properly diagnosed and provided with state of the art fixation by means of a splint or fiberglass bandage. During this time the horse gets used to its “stiff” leg and learns to use it.

**First aid treatment**  
Skin wounds must be treated with care. After covering the wound with a water-soluble antibiotic ointment, the hair surrounding the wound is removed and a sterile dressing applied under the bandage. With open fractures, the bone must be cleaned and covered with a sterile dressing. Immediate administration of systemic antibiotics is indicated in horses with open fractures or large wounds. The notion that analgesics should not be administered to horses with fractures is unfounded. Systemic analgesics should be given as soon as the fracture is stabilized. Fractures are rarely associated with severe hemorrhage. However, pain and shock lead to substantial fluid loss, which should be replaced using intravenous fluid therapy.

In most cases, judicious use of a sedative makes the examination and emergency treatment of an acutely traumatized horse much easier, particularly in horses that are already stressed from competition or are in pain. Furthermore, horses do not tolerate external coaptation well, especially when the fixation extends above the carpus or tarsus. The use of a sedative may be necessary to induce acceptance of the external coaptation device.

Pain from instability is extremely stressful for the fracture patient. Effective stabilization of the fracture substantially improves the general well-being of the animal and it is better prepared for surgery. The stabilized fractured limb allows the horse to bear some weight on it for balancing during the transport. Therefore, the horse is much quieter once stabilization has been provided. There are a variety of splints that are suitable for stabilization of equine fractures. Splints applied in two planes at right angles (90 degrees) to each other must be placed in layers to the cranial, caudal, lateral or medial aspects of the padded limb and held in place with non-elastic tape. The splint should be placed such that the contractural forces caused by the limb muscles are counteracted. From the mid-radius and distal tibia proximally, the splint cannot be applied high enough, so an additional lateral splint reaching to the shoulder is incorporated into the bandage to counteract the muscular forces, which tends to induce a valgus deformity at the fracture site (**Fig 6**).

The equine cast, also referred to as a synthetic splint, is formed from fiberglass tape impregnated with a polyurethane resin. It is very strong and cures quickly, is easy to apply and very light. When applying the cast, the horse should stand quietly to prevent the occurrence of micro-fractures and folds in the cast, which may reduce its strength and cause pressure sores.

**Bibliography**


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