

Laser Therapy Healed Equine Leg Wounds Faster in Oklahoma State Study

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For Veterinary Practice News

Proud flesh formation in equine distal limb wounds may finally have met its match in the form of low-level laser therapy, Oklahoma State University research veterinarians reported this year.

In an eight-mare research study of full-thickness, mid-metacarpal leg wounds, those treated with the laser not only healed faster, but "A significant clinical observation was the absence of exuberant granulation tissue in the laser-treated wounds," said its study published in the May issue of the journal *Photonics & Lasers in Medicine*.

"This is potentially clinically relevant, because control of exuberant granulation tissue is a pivotal factor in management of equine wounds located in the distal limb," states the paper written by Henry W. Jann, DVM, MS, Dipl. ACVS, associate professor of equine surgery; Kenneth Bartels, DVM, MS, director of the Surgical Laser Laboratory; Jerry W. Ritchey, DVM, DACVP; et al.

"Wound healing in the distal limbs of horses is an aspect of veterinary medicine that has made few advances, in spite of our expanding knowledge and technological progress," the authors wrote. "In fact, treating distal leg wounds and the ensuing exuberant granulation tissue remains one of the most frustrating clinical challenges."

Exuberant granulation tissue, commonly called "proud flesh," is caused by the horse's natural tendency to over-produce normal granulation tissue, explained David S. Bradley, DVM, a fellow of the American Society of Laser Medicine and Surgery. "Especially in the distal limbs, contamination and infection; movement; poor blood supply; and the lack of supporting soft tissue all slow or inhibit normal epithelialization.

"In general, chronic wounds can heal at least 30 percent faster with the use of laser," said Bradley, a veterinary laser consultant based in Stuart, Fla. "This reduces the chance of formation of proud flesh. It also helps lessen muscle atrophy, and can lead to a quicker return to function."

Equine veterinarians are using laser therapy for a growing

number of conditions, but one hitch in the process is that many of them have ambulatory practices and must figure out a way to treat the patient every other day or so, Bradley said.

"In general, the laser is a prescriptive device by the veterinarian, but it can be delegated and the protocol set up so that the owner or trainer can do the follow-up treatments," he said. "Some larger facilities have invested in laser therapy equipment, or it is permanently 'on loan' from their veterinarian."

While human medicine requires certification for laser usage, veterinary medicine does not, Bradley said.

Lasers used for wound therapy emit light in the near-infrared spectrum, with wavelengths of 635-1100 nanometers, Bradley said. The Oklahoma State study used a line-generated optical scanner with a dual diode laser system, at a wavelength of 635 nm and an energy output of 17 mW per diode.

"Countless topical preparations and medications have been applied to distal leg wounds over the millennia and even in recent times, but few have actually been scientifically shown to possess significant clinical efficacy," including corticosteroids, platelet-rich plasma, occlusive dressings, collagen gel and growth factors, wrote the Oklahoma State veterinarians.

Compared to the control wounds, those treated with the laser were completely epithelialized at day 80 post-surgery, while the control wounds were not.

"Laser therapy has a direct photochemical effect within the body to increase the delivery and release of oxygen to the tissues. It then enhances the conversion of oxygen to ATP [adenosine triphosphate] within the mitochondria," said Bradley. "This improves cell proliferation and differentiation; therefore, wound contracture and epithelialization are faster. In addition, it reduces inflammation and can augment the immune system to help prevent infection.

"It is being used more in veterinary medicine, due to the better understanding and delivery of proper laser dosages than we had even just four to six years ago," Bradley said. ●