ALTERNATE METHODS OF SOFT TISSUE IMAGING

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INTRODUCTION:

Technological advances in the past 15 years have markedly improved the evaluation of soft tissue injuries in athletes. Sonography is currently the most popular form of imaging soft tissues of the horse. Other methods to evaluate soft tissue which can contribute significantly to soft tissue injury assessment are thermography, vascular and soft tissue phase scintigraphy, computer-aided tomography (CAT scan), and magnetic resonance imaging (MRI). To date, CAT scans and MRI have been performed on the horse but because of the nature of the equipment and size of the horse, these modalities are rarely available in clinical practice. Like sonography, these modalities require prior clinical identification of the area to target the diagnostics. However, with horses it is not always possible to identify the origin of the pain, in which case, thermography and scintigraphy can be most useful.

Thermography and scintigraphy provide the examiner with the opportunity to examine the entire horse. When combined with a thorough clinical examination, these methods are extremely useful in identifying soft tissue injuries that may have otherwise gone undetected. The purpose of this manuscript is to describe the use of thermography and scintigraphy in the identification of soft tissue injury.

THERMOGRAPHY:

Thermography is the pictorial representation of the surface temperature of an object.[1,2] It is a non-invasive technique that measures emitted heat. A medical thermogram represents the surface temperatures of skin making thermography useful for the detection of inflammation. This ability to non-invasively assess inflammatory change, makes thermography an ideal imaging tool to aid in the diagnosis of certain lameness conditions in the horse.

Heat is perpetually generated by the body, and it is dissipated through the skin by radiation, convection, conduction, or evaporation.[2] Because of this, skin temperature is generally 5°C (9°F) cooler than body core temperature (37°C). Skin derives its heat from the local circulation and tissue metabolism.[3] Tissue metabolism is generally constant, therefore variation in skin temperature is usually due to changes in local tissue perfusion. Normally, veins are warmer than arteries because they are draining metabolically active areas. Superficial veins will heat the skin more than superficial arteries, and venous drainage from tissues or organs with a high metabolic rate will be warmer than venous drainage from normal tissues.

The circulatory pattern and the relative blood flow dictate the thermal pattern which is the basis for thermographic interpretation.[2] The normal thermal pattern of any area can be