

Use of Thermography for Initial Detection of Early Reflex Sympathetic Dystrophy*

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Reflex sympathetic dystrophy is one of a complex of overlapping, sympathetically maintained pain syndromes which are usually initiated by a minor injury that resolves quickly but leaves behind a persistent pain that generalizes to much or all of the limb. The pathophysiology of reflex sympathetic dystrophy is reviewed to show that the pain is accompanied by cooling of the limb, beginning with the distal end and gradually progressing throughout. Thermography is shown to be an effective way to monitor near-surface blood flow in the limbs and to be sensitive to changes accompanying painful conditions. The usefulness of this technique for early detection of reflex sympathetic dystrophy is demonstrated and illustrated with several examples.

Pathophysiology

Reflex sympathetic dystrophy almost always begins with a minor injury, such as a mild ankle sprain, which resolves normally. However, not only does the pain continue, but it rapidly spreads throughout the limb. Most commonly, the pain begins in the foot and gradually spreads up the limb in a nondermatomal pattern. This is accompanied by hyperalgesia, so the limb cannot be touched by the examiner without the subject reacting vigorously. The reaction occurs even if the subject is not aware that he or she is going to be touched. After several months, even light clothing is uncomfortable, so patients frequently wear shorts even in cold weather. Weightbearing frequently becomes pro-

gressively more uncomfortable and, eventually, the typical signs of disuse atrophy appear. The limb becomes mottled and somewhat withered, while sufficient osteoporosis eventually develops to produce positive findings on bone scans.¹ However, bone scan is not a good initial method for diagnosis of reflex sympathetic dystrophy, because the bone scan does not become abnormal until late in the disease process.²

Reflex sympathetic dystrophy rarely resolves on its own, and many patients can be disabled for life once the disease progresses to its chronic form. The pain remains severe and unremitting, although it varies in intensity from day to day. Further information about relationships between reflex sympathetic dystrophy and other sympathetically maintained pain syndromes, as well as background about ways of staging its severity and progress, can be found in articles by Fields³ and Schwartzman and McLellan.⁴

Reflex sympathetic dystrophy is virtually always accompanied by decreased temperature of the limb, beginning at the distal end and gradually spreading throughout the limb. In some cases, the decreased temperature will gradually spread to the other limb

* The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.

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