

THE ROLE OF INFRARED THERMAL IMAGING (ITI)

IN MANAGEMENT OF NEUROPATHIC PAIN

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Abstract

The value of Infrared thermal imaging (ITI) is limited to evaluation of neurovascular dysfunction. It provides useful diagnostic and therapeutic information in the management of neuropathic pain [1].

Key Words: Infrared thermal imaging, neuropathic pain, ITI in pain management.

Introduction

The nociceptive chronic pain is usually due to involvement of large somesthetic (somatic) nerve fibres. Electromyography (EMG) and nerve conduction velocity (NCV) tests are usually the diagnostic tools for the study of somesthetic pain. In contrast, these tests are normal in neuropathic pain because they can not detect changes in the microscopic thermosensory neurovasculature. The diagnosis and management of neuropathic pain requires neurovascular autonomic tests such as infrared thermal imaging.

Methods

The role of ITI in pain management was studied in 762 successive complex pain patients evaluated with ITI. The results were compared with a meta- analysis of medical literature. A Bales Scientific Infrared Thermal Processor and an Agema (Flir) Infrared Thermal Processor were utilized in this study. The patients were cooled down in a 20-21°C steady state room for 30 minutes of equilibration without clothing. No prior smoking for 90 minutes. A standard sensitivity of 24-34°C was done. If the areas were not properly visualized the physician would adjust the sensitivity accordingly. Two identically reproducible images recorded on laser disc were required.

Results

The study revealed the importance of proper technique and proper clinical correlation. ITI is useful in the study of complex neuropathic pain. It provides indispensable diagnostic and therapeutic information. Both superficial and deep temperature changes influence the ITI test. The skin is an almost perfect radiator of both deep and surface heat. This radiator has 98% emissive efficiency [2]. The ITI records pathological temperatures at least as deep as 27 mm (Fig 1) in the extremities, and even deeper in the breast [3-5].

Conclusion

ITI exclusively provides diagnostic information in neuropathic pain. Such information cannot be achieved by EMG or NCV. ITI is useless in diagnosis and management of cervical and lumbar sprain. It can spare patients from unnecessary amputation, carpal tunnel, temporomandibular joint, spinal disc surgeries and migraine. It is helpful in differentiating cervicogenic headache from migraine-each requiring opposite forms of treatment. In electrical injury ITI identifies points of entrance and exit of electricity. This picture is pathognomonic and is exclusively seen in electrical injury. ITI identifies hyperthermic foci of permanent sympathetic system damage sparing the patient from further damage by trauma of sympathetic nerve blocks.

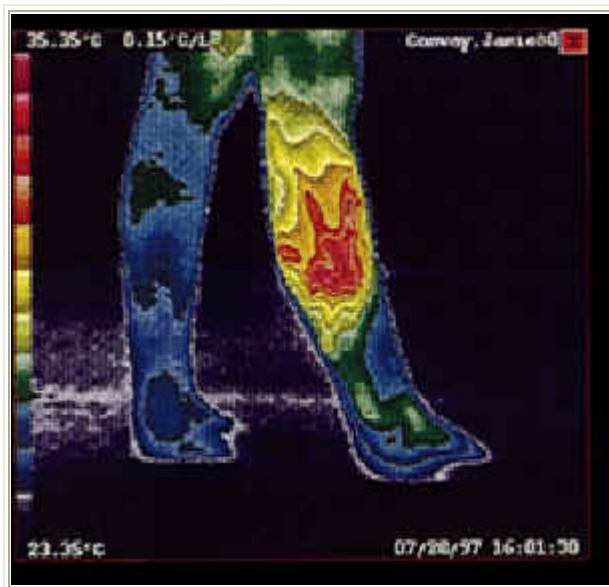


Figure 1- A previously undiagnosed right leg arteriovenous malformation over 27mm deep, complicated by Complex regional pain syndrome. ITI identified the deep lesion and spared the patient from the scheduled sympathectomy. Vascular surgery corrected the condition.

References

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