

The Combination of Liquid Crystal Thermography and Duplex Scanning in the Diagnosis of Deep Vein Thrombosis

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One hundred patients with clinically suspected deep vein thrombosis (DVT) were studied by liquid crystal thermography (LCT), duplex scanning and venography. Liquid crystal thermography was found to have a negative predictive value of 97% if performed within 1 week of the onset of symptoms. Duplex scanning had a sensitivity of 93% and specificity of 91% for all thrombi (proximal and calf). On the basis of these results a plan of investigation has been formulated that would avoid duplex scanning and venography in 39 of the 100 patients. Duplex scanning alone would be appropriate in 56 of the remaining 61 patients. Only six patients would be unsuitable for duplex scanning because of a very tense tender leg and require venography. The plan would miss one calf thrombus and result in treating three patients unnecessarily. This policy would be not only effective but also cost-effective.

Key Words: Deep vein thrombosis; Liquid crystal thermography; Venogram; Duplex scan.

Introduction

Several studies have demonstrated that acute deep vein thrombosis (DVT) can be detected by ultrasonic duplex scanning with a sensitivity of 96% and specificity of 95%¹⁻⁴ so that in centres where this technique is available, venography is now rarely performed. Because of the accuracy and cost-effectiveness of duplex scanning compared with venography the demand for this method has increased to such an extent that the availability of scanning time has become a limiting factor. It is now apparent that a simple screening method that could identify legs without DVT and avoid the need for duplex scanning would be highly desirable.

Thermography is a non-invasive method used in the past to detect DVT.⁵ The principle behind the test is the observation that the skin temperature of a limb with DVT is increased and can be detected with an infra-red telecamera. However, the cost and bulkiness of the equipment, which has to be placed in a constant temperature room, has limited its wide-

spread use. In recent years liquid crystal thermography (LCT) has overcome these limitations and has provided us with a method that can detect DVT with a sensitivity of 97% and a specificity of 62%,^{6,7} providing a screening test for determining absence of DVT. In addition, LCT can be performed at the bedside with minimal training.⁷

The aim of our study was to demonstrate that by combining LCT with duplex scanning one could avoid not only venography, but also duplex scanning, in a large proportion of patients with clinically suspected acute DVT, saving time not only in the angiography room but also in the ultrasonic service. Therefore, it was necessary as a first step to determine the accuracy of both LCT and duplex scanning against venography in the same group of patients. The results could subsequently be used to formulate the most appropriate and cost effective application.

Materials and Methods

Patients

One hundred patients with clinically suspected acute DVT have been included in the study. Twenty-two

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