


# To scan the lot – or not? Are the calf veins important when scanning for possible deep vein thrombosis?

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Deep vein thrombosis (DVT) more distal than the popliteal vein, also referred to as distal DVT or calf vein DVT, has been relatively neglected in comparison to proximal DVT – most likely because it has been seen as less clinically significant. The UK National Institute for Health and Care Excellence (NICE), in their clinical guideline CG144 published in 2012, specifically recommended that when DVT is suspected, the ultrasound scan should only cover as far distally as the popliteal vein; in other words, a full-leg scan including the calf veins was not required.<sup>1</sup> Vascular Scientists and many venous physicians were unhappy at the time that CG144 was published, as they felt that the gold standard test was clearly a full-leg ultrasound, including the calf veins rather than a reduced 2- or 3-point compression technique on the proximal veins only. This is not just an issue in the UK, as there are also significant variations in practice in the USA,<sup>2</sup> not resolved by the most recent update by the American College of Chest Physicians (ACCP) which has simply suggested both techniques are acceptable.<sup>3</sup>

The only randomised trial to compare the aforementioned two techniques, by Bernardi et al., concluded they were equivalent, although the study endpoints were proximal DVT, not total DVT or distal DVT.<sup>4</sup> However, the authors did note that once identified, distal DVTs were only found and treated in the full-leg scan group (6.2%), but outcomes were equivalent between the two groups over a 3-month follow-up, suggesting that the undiagnosed calf DVTs in the 2-point compression group were not clinically relevant. Almost certainly, this study was not powered to reach that very specific conclusion. Around one-quarter of patients in the 2-point compression group, however, did have rescanning at 1 week to rule out proximal extension.

At least, in part, the thinking behind the NICE recommendation in CG144 was because of the lack of certainty about the clinical relevance of distal DVT and that essentially they were only important if they progressed proximally. To put it simply, why try and find distal DVT unless it needs to be treated? Additionally, it was felt the skills and time required for all patients with possible DVTs to have a

full-leg scan were not justified, or indeed widely available. The emphasis was instead, and probably at that time correctly, on the scan being provided rapidly – ideally within 4 hours of presentation. The algorithm for DVT diagnosis in CG144 allowed for a rescans in those with a high clinical probability, positive D-dimer and a negative proximal scan, and such an approach does seem reliable in spotting those with proximal progression, assuming the second scan does take place. Of course, it does not find the distal DVTs themselves.

Time has moved on and NG158 replaced CG144 in 2020 – however, in this updated NICE guidance, there is now no reference at all to full-leg scanning, even as an alternative. The algorithm remains as an initial 2-level Well's score which if scores  $\geq 2$  indicates likely DVT and then suggests a proximal leg vein ultrasound scan. If this is negative and a subsequent D-dimer test positive, a repeat proximal leg vein ultrasound scan is recommended 6–8 days later. Again, this has provoked controversy.

Since CG144, however, there has been a change in our understanding of the clinical relevance of distal DVT. A recent Cochrane review identified eight relevant RCTs, concluding that there is a benefit for people with distal DVT treated with anticoagulation therapy using vitamin K antagonists, with little or no risk of major bleeding events.<sup>5</sup> Additionally in a systematic review of patients

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with calf DVT, the prevalence of silent PE was surprisingly high at 13%.<sup>6</sup> As a result, the recent European Society for Vascular Surgery (ESVS) guidance is now recommending considering the treatment of calf vein DVT, if identified, based on risk factors and bleeding risk.<sup>7</sup> One additional consideration, which is not proven but in our opinion persuasive, is that a treatment strategy for distal DVT could potentially prevent at least some of the progression to more proximal DVT and thereby possible progression to post-thrombotic syndrome (PTS). To support this proposition, in the recent report of Kuczmik et al., DVT propagation was less in the treated group (2.8% vs 8.3%) than in those managed with serial ultrasound initially.<sup>8</sup>

Is there a middle way? The recently published ESVS guideline references the hybrid approach of using both techniques for DVT scanning, based on the Palladio study, in which either approach was used depending on pre-test probability and D-dimer, with whole-leg US reserved for those with high pre-test probability and positive D-dimer.<sup>9</sup> Unfortunately, the algorithm is not validated, and the new ESVS guidance is to use whole-leg ultrasound when it is available and if there is a clinical suspicion of calf vein DVT. Exactly what constitutes a clinical suspicion of calf vein DVT is, however, not fully clarified. Perhaps it would be a patient with a strong significant clinical suspicion of a DVT (including calf pain, swelling and/or superficial thrombophlebitis) with a negative proximal US? Performing whole-leg ultrasound in these patients, whilst more time consuming initially, would potentially be balanced as it could avoid a subsequent repeat proximal duplex scan, which is costly for the NHS and inconvenient for the patient.<sup>10</sup>

We believe there is now evidence that treating calf DVT may result in better clinical outcomes. While accepting that full-leg US may not be available in all centres in a timely way, it should still be regarded as the gold standard technique, and where available, it should be preferred. Additionally, if found, distal DVT should probably be treated in those with an acceptable bleeding risk. Furthermore, when a symptomatic patient has an ultrasound, it is not simply to rule out DVT but also to investigate for any alternate diagnoses, such as haematoma (either spontaneous secondary to anticoagulation or due to muscle rupture), cysts (particularly haemorrhagic popliteal cysts where D-dimer will be elevated), tumours, previous DVT that has not been documented or the patient is not aware of, or post-thrombotic reflux. Correct diagnosis will improve the patient's management and save subsequent visits. A whole-leg scan is also imperative when a patient presents with PE, in order to locate the source of thrombus as, as previously mentioned, it may be in the calf veins only.

DVT is a continuum and not just a one-time event for many people. If it is found and documented, it can

impact the future management of that patient; in patients with previous DVT, even isolated to the calf veins, thromboprophylaxis would be a must for any subsequent procedures. Similarly, if they presented with a further DVT, this would then be classed as recurrent VTE, which could also potentially alter management such as consideration of permanent anticoagulation. More trials are needed, but calf vein DVT seems not to be the benign entity it was once thought, and full-leg ultrasound, in our view, remains the gold standard test for DVT.

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