Diagnosing deep vein thrombosis : the case for compression ultrasonography limited to the proximal veins

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LETTERS TO THE EDITOR

Diagnosing deep vein thrombosis: the case for compression ultrasonography limited to the proximal veins

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In studies using phlebography as the gold standard, lower limb venous compression ultrasonography (CUS), an entirely non-invasive test, has a sensitivity of 97% [95% confidence interval (CI) 96–98%] and a specificity of 98% for symptomatic proximal deep vein thrombosis (DVT) [1]. It has become the cornerstone of DVT diagnosis in clinically suspected individuals [2–4]. The single well validated diagnostic criterion for deep vein thrombosis on CUS is absence of full compressibility of the deep vein when applying gentle pressure through the ultrasound probe.

The extensiveness of the exam (particularly the inclusion of calf veins or not in the diagnostic procedure) is heavily debated among experts. The 3-month thromboembolic risk in patients with a negative CUS of the proximal veins only is low: in management studies, it is around 1% in series using serial CUS (CUS repeated after 1 week in patients with an initially negative CUS [5–8]) and about 2% in the study that studies a single CUS [9] (Table 1, upper panel). Table 1 also shows that the 3-month thromboembolic risk would also have been around 2% in the serial CUS series if the repeat CUS had not been performed due to the very low prevalence of proximal DVT at 1 week in patients with an initially negative CUS (this is assuming that all patients in whom a DVT was shown by the repeat CUS would have had a thromboembolic event during the 3-month follow-up if left untreated). Those data obviously question the need for diagnosing so-called distal DVT, at least in non-high clinical probability patients. As a matter of fact, the 3-month thromboembolic risk in patients with clinically suspected DVT who had a negative venogram was found to be as high as 1.9% (95% CI 0.4–5.4%) [10].

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Three recent large series (Table 1, lower panel [11–13]) conclude that complete examination of the leg deep vein system without any other exam is safe and effective in managing patients with clinically suspected DVT. However, although the 3-month thromboembolic risk appears to be 1.5% lower than for the CUS limited to the proximal veins, detecting clots in the posterior tibial or peroneal veins or even in calf muscle veins may be double-edged: on one hand, the potential of reducing the 3-month thromboembolic risk is small (because it is already quite low), and, on the other hand, the risk of false-positive findings and subsequent unnecessary anticoagulant treatment in patients who could be left untreated, is quite high. As 31–56% of the DVTs diagnosed in those recent series resorting on complete examination of the lower limb veins were distal, such an approach entails a substantial risk of overdiagnosis and overtreatment that may outweigh the apparent small difference in terms of 3-month thromboembolic risk. In addition, the exam protocols that include a study of the distal veins are quite cumbersome and require more specialized skills.

Interestingly, Gottlieb *et al.* [14] randomized more than 500 patients clinically suspected of DVT to undergo routine complete US of the calf veins or selective exam in the area of calf symptoms if present. The rate of isolated calf DVT detected was very low and similar in the two groups (1.3 and 1.5%, respectively), and the 3-month thromboembolic risk was below 1% with no difference between the groups. Again, these findings question the pertinence of the systematic complete calf veins exam, especially in view of a positive predictive value of at best 50% if we assume a specificity of distal CUS of 99% (quite an optimistic assumption) in a population with such a low prevalence of the disease.

As long as convincing hard data on the need for treating isolated distal DVT are not available, we strongly feel that CUS should be limited to the proximal veins in clinically suspected DVT, except perhaps in patients with a high clinical probability in whom a lower rate of false-positive CUS may be anticipated. Strategies with a so-called complete CUS are associated with a high risk of overdiagnosis and, hence, potentially dangerous overtreatment without obvious clinical benefit.

Table 1 Performance and safety of proximal only or proximal and distal CUS for diagnosing DVT

Series	Patients (*n*)	Prevalence of DVT (%)	Proportion of distal DVTs (%)	Number of CUS performed per 100 patients (*n*)	Three-month thromboembolic risk, % (95% CI)*	
					Serial CUS	Single initial CUS**
Proximal CUS only						
Cogo *et al*. [5]	1702	24	N.A.	176	0.7 (0.3–1.2)	1.6 (1.0–2.6)
Bernardi *et al*. [6]	946	28	N.A.	176	0.7 (0.3–1.2)	1.2 (0.5–2.3)
Wells *et al*. [7]	593	16	N.A.	109	0.4 (0–0.9)	1.2 (0.5–2.7)
Kraaijenhagen *et al*. [8]	1756	22	N.A.	128	0.6 (0.1–1.8)	2.5 (1.8–3.5)
Perrier *et al*. [9]	474	24	N.A.	121	0.7 (0.3–1.6)	2.6 (0.2–4.9)
Proximal and distal CUS						
Elias *et al*. [11]	623	36	45	73	N.A.	0.5 (0.1–1.8)
Schellong *et al*. [12]	1646	17	56	100	N.A.	0.5 (0.1–1.8)
Stevens *et al*. [13]	445	14	31	100	N.A.	0.8 (0.2–1.3)

*During 3-month follow-up in patients left untreated. **This figure is obtained by adding the patients in whom the repeat CUS at 1 week showed a DVT to the observed 3-month thromboembolic risk in the serial CUS series (see text). N.A., not applicable

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