Duplex Ultrasonography for Diagnosis of Blood Clots in the Arms and Shoulders

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The full report is titled "Prospective Study of Color Duplex Ultrasonography Compared with Contrast Venography in Patients Suspected of Having Deep Venous Thrombosis of the Upper Extremities." It is in the 18 June 2002 issue of *Annals of Internal Medicine* (volume 136, pages 865-872). The authors are H-J Baarslag, EJR van Beek, MMW Koopman, and JA Reekers.

What is the problem and what is known about it so far?

Sometimes adults get blood clots in their veins, a condition known as deep venous thrombosis (DVT). The blood clots usually form in leg veins, but they can occur in the veins of the arms and shoulders, particularly in people who have cancer and a central venous catheter (a tube inserted through the skin into a vein near the heart to deliver drugs such as those used in chemotherapy). Blood clots in the deep veins are dangerous because they can break free and travel to the lungs. This problem, called pulmonary embolism (clot in the lung), can be fatal. It is important to diagnose DVT because special blood-thinning drugs reduce the risk that a clot will travel to the lungs.

Venography is the standard test for diagnosing DVT. Venograms are x-rays that are taken after injection of a liquid dye into a vein. They can be harmful. Duplex ultrasonography scans are a safer way to diagnose DVT. These scans use short pulses of sound waves transmitted from a device placed on the surface of the skin to look at blood flow in the veins. We know that ultrasonography can find clots in the legs, but we don't know how it compares with venography in finding clots in the arms and shoulders (upper extremity DVT).

Why did the researchers do this particular study?

To compare duplex ultrasonography with venography for diagnosis of upper-extremity DVT.

Who was studied?

126 adults with suspected upper extremity DVT.

How was the study done?

Ultrasonography scans were done first. A second doctor who did not know the result of the scans then performed venography. Results of the scans were compared with results of venography.

What did the researchers find?

Twenty-three patients (18%) did not have venography because of medical or technical reasons, because of logistic reasons, or because they decided not to. Three patients had scans that the doctors could not interpret as positive or negative. Scans found 36 of 44 clots (82%) that were found by venography. Scans found no clots in 45 of 55 people (82%) who did not have clots on venography.

What were the limitations of the study?

Venography is not 100% accurate in detecting clots. Although it is the most accurate test for diagnosing DVT, it is not a perfect comparison standard.

What are the implications of the study?

Duplex ultrasonography scans are feasible, reasonably accurate tests for diagnosing upper extremity DVT.