Traumatic Thrombosis of the Right Subclavian Vein

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A 22-year-old man injured the right sternoclavicular joint after a road traffic accident in May 1985. There was considerable swelling at the time and since then he has noticed prominence of the veins on the right side of the chest and upper arm. When exercising, he develops a bursting, burning feeling in the arm, which then becomes tight. He was previously a fitness fanatic and is now unable to perform repetitive exercise.

Clinical Findings

Distention and prominence of the veins over the upper arm and chest wall on the right circumference of the right upper arm was 3 cm greater than the left. Axillary brachial and radial pulses were normal.

Doppler studies of the veins revealed that there was a reduced Valsalva on the right, and compression of the veins revealed a reduced increase in peak return compared with the left upper limb. These findings suggest some obstruction in venous return.

Investigative Procedures

Venography—September 1985

This study demonstrated an occlusion of the right subclavian vein with a collateral circulation providing some flow into the anterior jugular and the right innominate vein.

Ultrasonography—December 1989

An ultrasound of the supraclavicular fossa using a biosound N.D. 256 and 8 mHz probe demonstrated persisting thrombus in the right subclavian without any recanalization of the vessel.

Thermography—October 1989

Thermography studies were performed pre- and post-stress.† The stress consisted of 15 pushups sufficient to produce pain in the right arm.

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In the pre-stress views (Figure 1) there was mild asymmetry in the right anterior sterno-mastoid area and over the right side of the face. In the post-stress views (Figure 2) the asymmetry became much more pronounced, with the increased heat extending from the supraclavicular area into the right upper shoulder and the right infraorbital area (Table 1). It is assumed that the increased heat seen thermographically is due to delay in venous return consistent with occlusion of the right subclavian vein seen previously on venography.

Discussion

The late morbidity in subclavian vein thrombosis is significant, with up to 40% of cases showing residual symptoms. This case demonstrates the use of three different imaging modalities in the assessment of subclavian vein thrombosis. Venography is the established investigation for demonstrating the site of block and collateral circulation, but it often fails to define the proximal extent of obstruction.[1,2] Ultrasonography is a noninvasive imaging technique with an increasing scope of applications. In this case, ultrasound demonstrated residual thrombus without recanalization and the proximal extent of the block. Thermographic assessment of venous thrombosis has been widely documented in the lower limbs.[3,4] In this case, the value of repeating the thermographic study after stress is well illustrated and demonstrates the ability of thermography to provide func-

Table 1. Temperature (°C) analysis by region pre- and post-stress

Area	Pre-stress	Post-stress
1. R. infraorbital	33.4	33.3
2. L. infraorbital	32.95	32.8
Different ΔT (°C)	+0.45	+0.5
3. R. anterior shoulder	32.55	33.4
4. L. anterior shoulder	31.85	32.0
Different ΔT (°C)	+0.7	+1.4
5. R. extensor hand	28.2	28.0
6. L. extensor hand	27.8	27.25
Difference ΔT (°C)	+0.4	+0.75