# SVT Archive Case Study - November 2000

30th Anniversary
1992 - 2022
Revisiting our SVT Archives

## Reverse flow in the Internal Carotid artery

A 56 year old male patient was referred to the Vascular Laboratory following a sudden onset of left sided weakness and slurred speech. He smoked 10 cigarettes per day and had hypercholestrolemia. There were no other risk factors or previous history.

Duplex examination of the right subclavian artery proved difficult and a satisfactory image was not obtained. On examination of the right brachial artery, a monophasic waveform was obtained(Fig 1), suggesting proximal occlusive disease. Systolic brachia! pressure was reduced on the right relative to the left (70 mmHg vs 120 mm Hg}. The left subclavian artery was within normal limits.

The flow pattern throughout the right common carotid artery was bidirectional with a net flow in the antegrade (towards the head} direction (Fig 2). Distal to the carotid bifurcation, retrograde flow was detected in the internal carotid artery (Fig 3) and antegrade flow in the external carotid artery (Fig 4). From the waveforms it was obvious that the flow characteristics were not typical of these vessels. There were no areas of plaque demonstrated in any of the carotid vessels. The colour Doppler indicated complete vessel filling with no areas of thrombus or soft plaque detected. Retrograde flow was detected from the right vertebral artery (Fig· 5). The flow patterns are summarised in Figure 6.

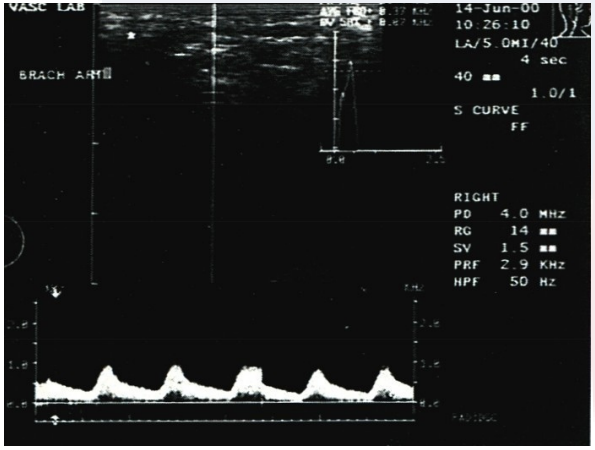


**Fig 1 Right brachia/ artery**

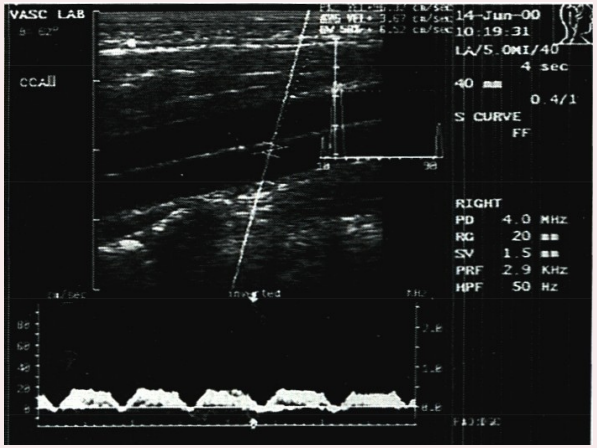


**Fig 2 Right common carotid artery**

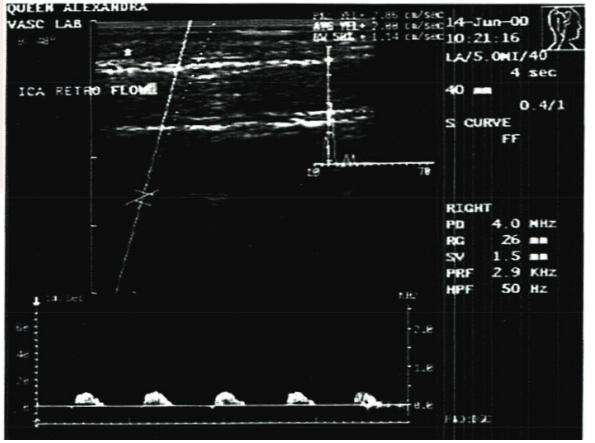


**Fig 3 Right internal carotid artery**

On the left side, all carotid vessels and the vertebral artery displayed antegrade flow with normally shaped waveforms but slightly high peak velocities (e.g. 1.2 mis in the CCA}. No evidence of plaque was detected.

These findings led to the conclusion that the innominate artery must be occluded proximal to the origin of the right carotid artery, therefore causing the unusual flow patterns in the carotid territory. The retrograde flow in the vertebral artery was filling the right distal subclavian artery and the arm arteries, which is generally referred to as a subclavian steal syndrome.

Angiograms are not routinely performed in our hospital for the carotid circulation, the surgeons relying solely on Duplex assessment. On this occasion angiography had been carried out and confirmed the diagnosis of an occluded innominate artery with right subclavian steal via the right vertebral artery.

No surgical treatment was felt appropriate for the patient at this stage due to the extensive nature of the stroke, but he is being kept under review.

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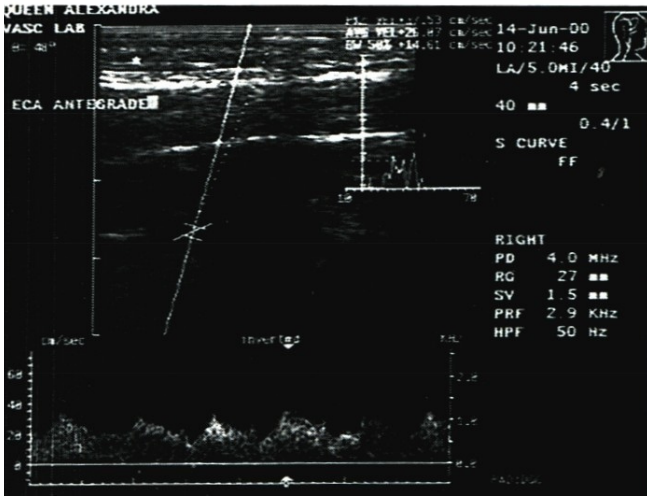


**Fig 4 Right external carotid artery**

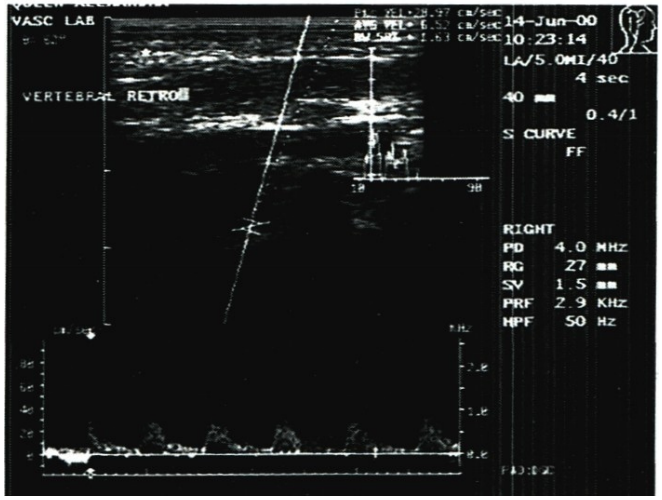


**Fig 5 Flow patterns in right carotid territory**

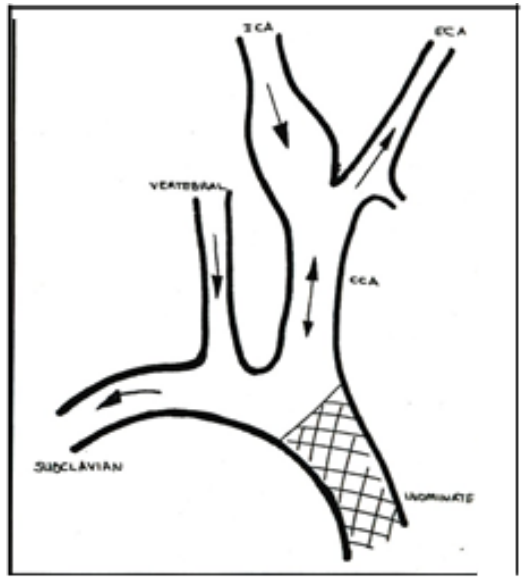


**Fig 6 Flow patterns in right carotid territory**