

ULTRASONIC GRAY SCALE DOPPLER ANGIOGRAPHY

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Examination of the carotid artery stenosis is very important in the diagnosis of cerebrovascular diseases. New possibilities in diagnostics of stenotic lesions are given by ultrasonic Doppler angiography.

In this method Doppler velocity signals are converted into a map of the blood flowing in arteries [1,2].

The aim of this paper is to present a Doppler imaging system developed by the authors for examination of blood flowing in carotid arteries.

The system is based upon a bi-directional c.w. Doppler flowmeter with a separate output for anterograde and retrograde flows. The Doppler shifted signals reflected by the blood flowing at peak velocities are detected by a bank filters. Signals from each filter are converted into various levels of the grey-scale display which correspond to the value of the blood flow velocity.

The 5 MHz ultrasonic probe is held by the scanning arm at 60° to the surface of the skin. This angle is maintained during the scanning procedure. The position of the probe is electronically sensed by the position-sensing circuitry which causes the beam of an image display to move in correspondence with the position of the probe. The Doppler image from the artery is freezed in a digital memory system. Moreover time interval histograms of Doppler signals can be observed on the display.

The clinical results obtained by means of the developed system showed a good agreement with X-ray arteriography for obstructions occluding more than 50% of the arterial diameter.

REFERENCES

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2. G. Curry, D.White, Color coded ultrasonic differential velocity arterial scanner /Echoflow/, Ultrasound Med.Biol. Vol. 4, 1978, pp. 27-35.