Pitfalls In Carotid Duplex Exams: How They Can Lead To False Positive And False Negative Results

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I have nothing to disclose

Contralateral tight stenosis or occlusion
High blood pressure
Tumor fed by the carotid
Inflammation
Vascular malformation
Arteriovenous fistula

Falsely high velocities

Overestimation of ICA stenosis due to CCA + ICA occlusion

It is also seen in cases of tight stenosis and found in one third of such patients.

Internalized ECA due to a carotid body tumor

In chronic ICA occlusion its lumen can become very Small leading to false identification.

Internalized ECA due to ICA occlusion
Takayasu's Arteritis - BCA tight stenosis

No plaque
Compensatory velocity increase

Falsey low velocities
Proximal stenosis
Ipsilateral CCA, BCA
Low blood pressure
Low cardiac output, valve stenosis or insufficiency
Stroke
ICA distal stenosis or occlusion
ICA recanalization

Stenosis >95% diameter reduction - the velocity is low due to huge energy loss

ICA 99% stenosis
Low ICA velocities due to high energy loss in the stenosis
PSV: 23 cm/s  EDV: 7 cm/s
PSV ratio: 0.64

ICA recanalization

PSV: 23 cm/s  EDV: 8 cm/s


Distal ICA dissection
Tight ICA distal stenosis
Ipsilateral stroke
Low PSV and EDV


Brachiocephalic artery instent stenosis

Low velocities in RT CCA, SCA and VA
Brachiocephalic artery occlusion

Takayasu’s Arteritis
Aorta and major branches, fibrosis and diffuse vessel thickening
Adventitial mononuclear infiltrate + perivascular cuffing of the vasa vasorum, intense mononuclear inflammation in the media

Low velocities may be seen in the ICA due to extensive narrowing in the BCA and CCA