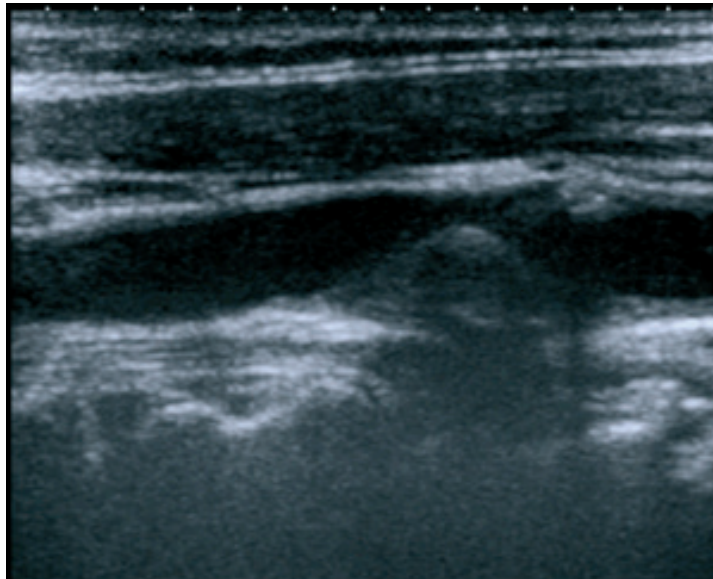# QUIZ: CAROTID ARTERY ULTRASOUND

A 60-year-old female outpatient with complaints of episodes of tachycardia was referred to the ultrasound department by her cardiologist. She was sent for carotid artery ultrasound as a significant carotid plaque was noted during a previous thyroid ultrasound (carotid artery bifurcation screening must be performed as part of thyroid ultrasound at our clinic).

It was started as a routine carotid artery ultrasound examination. However, possible surgical correction was considered in this case due to findings. In order to present this case to a vascular surgeon correctly, we have to use the multiparametric approach. Some of the images are demonstrated below (Fig. 1-4).

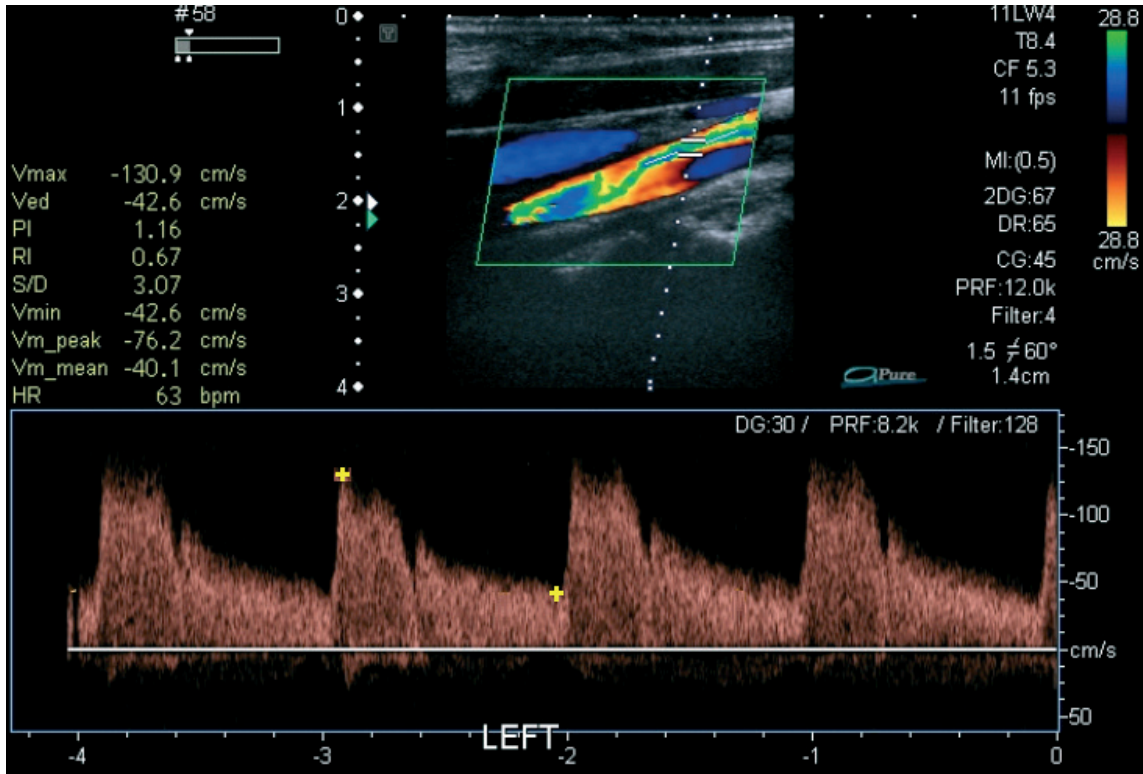**Figure 1. Proximal segment of the left internal carotid artery (left ICA)**

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Figure 2. Proximal segment of the left internal carotid artery (left ICA) – color Doppler ultrasound study
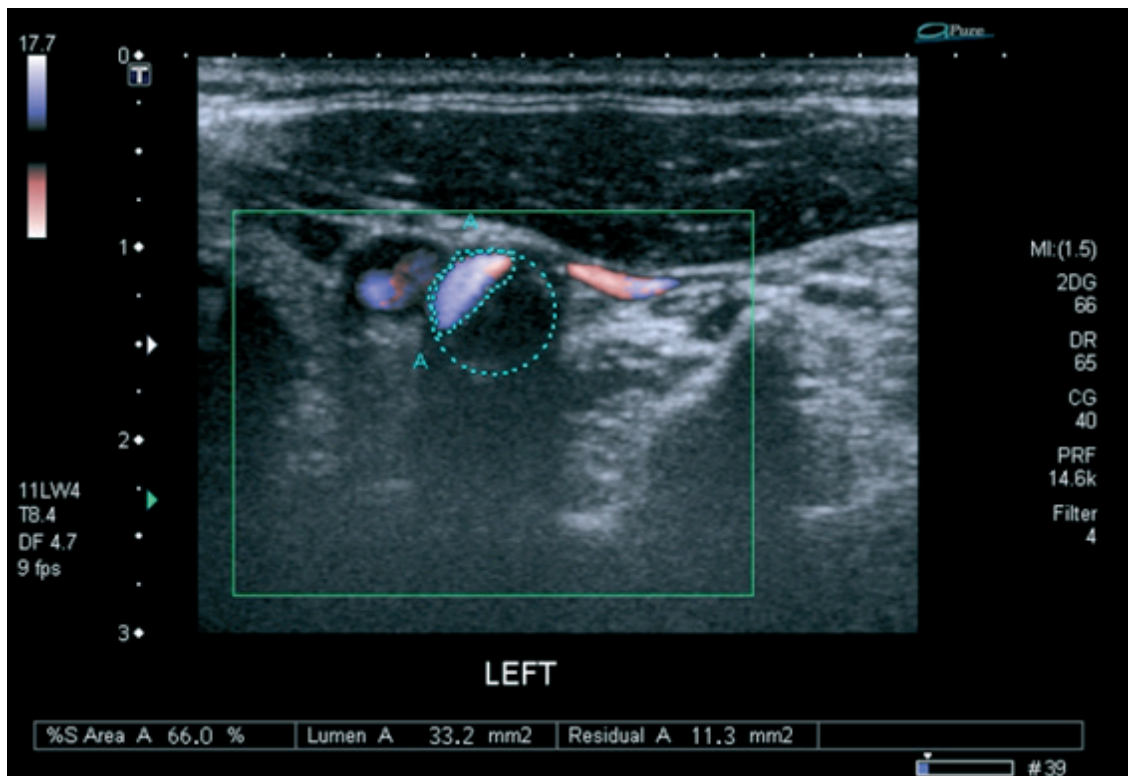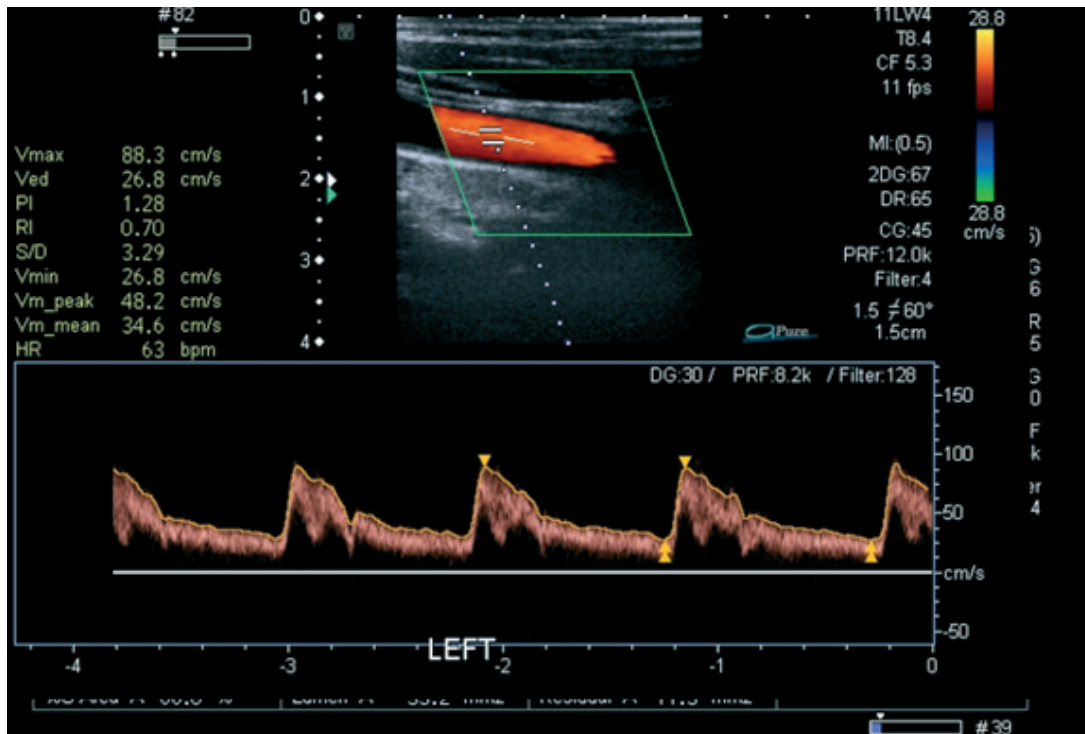

Figure 3. Left common carotid artery (left CCA) – cross-sectional area for the calculation of carotid artery stenosis

Figure 4. Left common carotid artery (left CCA) – color Doppler ultrasound study

Questions:

1. Please define what type of the plaque you can see on Figure 1 according to the Geroulakos classification (1).

- type I
- type II
- type III
- type IV
- type V

2. What is the degree of stenosis of the left internal carotid artery (ICA) based on Figures 2, 3 and 4?

- 0< 50 %
- 50 – 69%
- 70%

3. What would you call the color phenomenon when you see green color in the middle of the vessel, where the sample volume is located (Fig. 2)?

- Reverberation
- Aliasing
- Flow reversal
- Blooming

4. What would you call the color phenomenon when you see blue color at the posterior wall of the ICA, below the sample volume (Fig.2)?

- Reverberation
- Aliasing
- Flow reversal
- Blooming

5. What statement is more accurate if you compare spectral Doppler appearances of the left ICA (Fig. 2) and the left common carotid artery (Fig. 4).

-a poor acoustic window is demonstrated (Fig. 2)
-turbulent flow is demonstrated (Fig. 2)
-acoustic clarity is demonstrated (Fig. 4)
-spectral broadening is demonstrated (Fig. 2)

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References

1. Geroulakos G, Ramaswami G, Nicolaides A, James K, Labropoulos N, Belcaro G, et al. Characterization of symptomatic and asymptomatic carotid plaques using high-resolution real-time ultrasonography. Br J Surg 1993; 80: 1274-7. doi/pdf/10.1161/01.STR.20.2.175