

Case Study: Turbulent Flow in pICA

Concern: Turbulence in the proximal internal carotid artery (pICA). The Doppler reading is taken in a reasonable place as shown on page 2; however, turbulent flow can yield very high or very low peak velocities. Doppler results place the pICA in the 1-49% category suggesting that the patient does not require immediate follow up. Further review with *Visualize:Vascular™* 3D Luminal Rendering shows that there is a significant concern. CTA was recommended as follow up. CTA results agree with the results from *Visualize*.

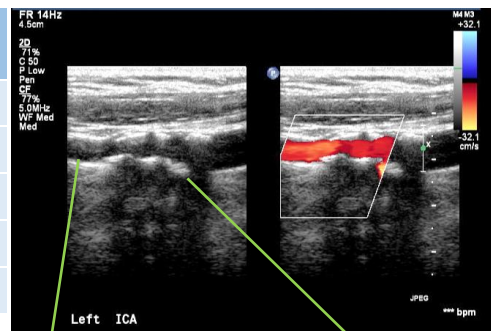
Patient History: 77-year-old Female with no previous history of vascular concerns.

Summary:

Left pICA	Carotid Duplex		<i>Visualize: Vascular™</i>	CTA
	PSV/EDV	Stenosis	Stenosis	Stenosis
	129/32	1-49%	77%	76%
Category		Mild	Severe	Severe

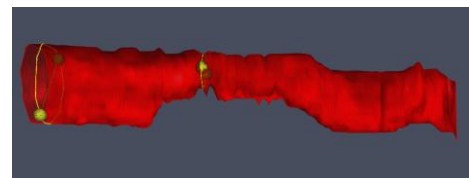
Carotid Duplex Exam: MILD

	Right ICA (PSV/EVD)	Left ICA (PSV/EVD)
D CCA	72/13	78/13
P ICA	96/14	129/32
M ICA	113/30	124/22
D ICA	115/22	78/18
ECA	221/8	78/13



Visualize:Vascular 3D Rendering Exam: SEVERE

Left pICA	
<i>Visualize: Vascular™</i>	77%



Visualize:Vascular uses Salient's patented algorithm to analyze the grey level in the ultrasound images generating the residual lumen in 3D. *Visualize* analyzes the entire segment of the vessel over the area of concern to determine luminal reduction or Stenosis. Doppler measures the velocity of the flow in the vessel at a specific point. In turbulent flow, there are places with very high velocity as well as those with very low velocity. Velocity measurements do not average out and can be misleading in turbulent situations. Color flow, shown on the right above, gives an overall shape to the segment; however, the color covers the residual lumen and extends beyond the lumen masking grey scale information. Color flow is not a precise technique and should not be used to measure luminal diameter.

Visualize uses a completely different technique than Doppler or Color Flow. The methodology used in *Visualize* is similar to angiography creating a new tool that tracks closely to angiography. *Visualize* uses

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ultrasound which does not place the patient at risk to imaging concerns. *Visualize* can be used more often, offering a way to monitor patient progress more closely.

The actual 3D results for this study are below:

1/1

Visualize: Vascular Report

Patient Name [REDACTED]	Exam Date [REDACTED]
MRN [REDACTED]	Accession Number [REDACTED]
DOB (Age) 12/21/1936 (77 years)	Exam Type 76377 3D Reconstruction
Sex Female	Report Author [REDACTED]
Date Reported 7/30/2014	Referring Physician [REDACTED]

④ Finding - L ICA
Vessel Segment: Transverse - L ICA - 3D Reconstruction

3D #1



Max: 4.9 mm Min: 1.1 mm

3D #2



Min: 1.1 mm Max: 4.8 mm

Luminal diameter: Min 1.1, Max 4.8 mm
Luminal reduction: 77% *

Vessel Segment: Sagittal - L ICA - Observation

Series 1 Image 65



Left ICA 50mm/s