GUNDERSEN/LUTHERAN ULTRASOUND DEPARTMENT POLICY AND PROCEDURE MANUAL

SUBJECT: Doppler Exam of Native Lower Extremity Arteries Post Angioplasty
SECTION: Vascular Ultrasound
ORIGINATOR: Deborah L. Richert, BSVT, RDMS, RVT
DATE: March 31,2016

APPROVED BY: _____
Jody Riherd MD

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Dave Clayton RDMS RVT

Scheduling: One half hour per extremity.

Prep: None.

Patient Position: Supine.

Equipment: Color flow duplex ultrasound unit with a 5.0 MHz linear array transducer. All spectral Doppler velocities are taken with an angle correction of 60 degrees or less. ***Procedure should be performed at the lowest possible power settings.

Purpose: Evaluation of a lower extremity native artery angioplasty/stent site or sites for patency, restenosis, or occlusion.

Exam Protocol:

1. The surgeon will document the location of the angioplasty/stent site in centimeters above the knee (AK) and/or where the stent or stents are located in the lower extremity. . This is written and documented on the worksheet.
2. In patients with just one angioplasty/stent site, the native artery is evaluated in longitudinal orientation from 10 cm. proximal to the angioplasty site to 10 cm. distal to the angioplasty site with color and spectral Doppler.
3. In patients with just one angioplasty/stent site, the peak systolic velocity (PSV) is measured at 10 cm. proximal to the angioplasty site, at the angioplasty site, and 10 cm. distal to the angioplasty site.
4. In patients with multiple stents, either continuous or in more than one separate location in the lower extremity, inflow and outflow PSV is measured as well as evaluation through the entire length of the stent(s).
5. Angle corrected spectral Doppler with an angle of 60 degrees or less is used for all PSV measurements including any site of suspected stenosis, two to three cm. proximal to the stenosis, and two to three cm. distal to the stenosis. The sample gate is parallel to the vessel wall and NOT the flow jet. A peak systolic velocity

ratio is then calculated using the velocity collected proximal to the stenosis as the denominator. The ratio need only be calculated in areas of stenosis.

Doppler criteria for evaluation of native lower extremity arterial stenosis:[1]

% STENOSIS	**PEAK VELOCITY**	**VELOCITY RATIO**
Normal	< 150 cm/sec	< 1.5
30% - 49%	150 - 200 cm/sec	1.5 - 2
50% - 75%	200 - 400 cm/sec	2 - 4
> 75%	> 400 cm/sec	> 4
Occlusion	No color saturation	

Imaging Protocol:

- Longitudinal native artery 10 cm. proximal to angioplasty site with color and spectral Doppler, and measurement of PSV.
- Longitudinal native artery at angioplasty site with color and spectral Doppler, and measurement of PSV.
- Longitudinal native artery 10 cm. distal to angioplasty site with color and spectral Doppler, and measurement of PSV.
- Any areas of stenosis should be documented at the area of stenosis, proximal to the stenosis, and distal to the stenosis with color and angle corrected spectral Doppler measurement.
- Indicate by drawing on the worksheet the level of the angioplasty and any areas of stenosis.
- In patients with multiple stents, either continuous or in more than one separate location in the lower extremity, inflow and outflow PSV is measured as well as evaluation through the entire length of the stent(s). In the instance of continuous multiple stents the PSV should be measured every 10 cm along the entire length of the stent(s). The location(s) of each velocity measurement should be indicated on the worksheet

References

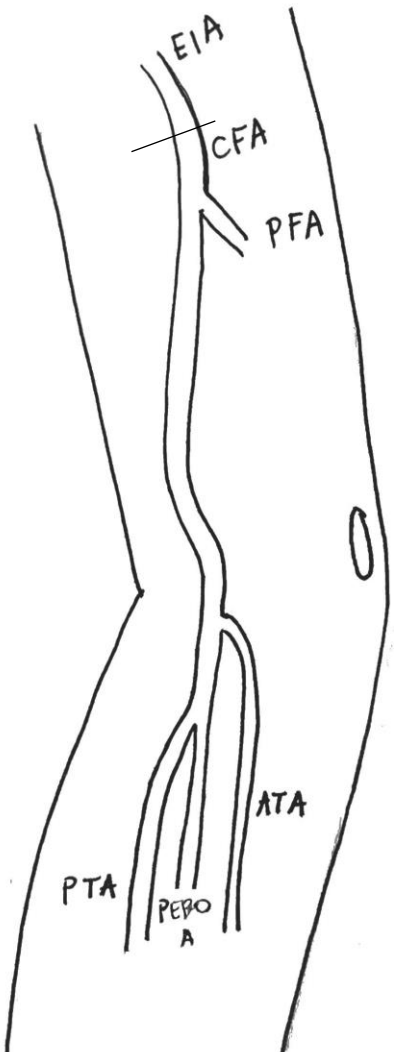
1. Cossman DV, Ellison JE, et. al. Comparison of contrast arteriography to arterial mapping with colorflow duplex imaging in the lower extremities. J Vasc Surg 1989; 10:522-92.

Gundersen Health Systems Ultrasound Department
Doppler Exam of Native Lower Extremity Arteries

Name: _____ MRN: _____ Exam #: _____ Date: _____

Leg Examined: RT _____ LT _____ Date of Procedure: _____ Surgeon: _____

Location of Angioplasty/Stent(s) : _____



**Please mark the area of the angioplasty site and any area(s) of stenosis on the drawing .

1. Measure the PSV 10 cm prox to angioplasty/stent site
2. Measure the PSV at angioplasty/stent site
3. Measure the PSV 10 cm dist to angioplasty/stent site
4. Measure the inflow, outflow, and PSV every 10 cm through the entire length of continuous stents

Location	PSV cm/s	PSV Ratio	Waveform
Inflow			
Prox Anast			
Dist Anast			
Outflow			

Impression: _____
_____
_____
_____
_____

% Stenosis	Peak Velocity	Velocity Ratio
Normal	< 150 cm/s	< 1.5
30% - 49%	150-200 cm/s	1.5 - 2
50% - 75%	200-400 cm/s	2 - 4
>75%	> 400 cm/s	> 4
Occlusion	No color saturation	

*The ratio is obtained by comparing the velocity at the area of stenosis with the velocity proximal to the stenosis. The velocity prox to the stenosis is the denominator in the ratio. Ratios only need to be calculated at areas of stenosis.

Sonographer: _____