GUNDERSEN/LUTHERAN ULTRASOUND DEPARTMENT POLICY AND PROCEDURE MANUAL

SUBJECT: Endovascular Aortic Stent Graft
SECTION: Vascular Ultrasound
ORIGINATOR: Deborah L. Richert, BSVT, RDMS, RVT
DATE: July 26, 2014

APPROVED BY: _____
Jody Riherd MD

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Dave Clayton RDMS RVT

Scheduling: Early A.M. in a one hour time slot.

Prep: NPO 10 hours.

Patient Position: Supine.

Equipment: Color flow duplex ultrasound unit with 2.0 to 4.0 MHz sector or curved array transducer.

Purpose: To evaluate endovascular aortic stent grafts for patency, stenosis, and the presence of possible perigraft leaks, increasing aneurysm size, and other complications.

Indications: Endograft stent graft placement is currently being performed on selected patients as an alternative method to traditional abdominal aortic aneurysm repair. More frequent follow-up is necessary than traditional aortic repair. In experienced hands, color duplex ultrasound can be used to reliably determine the presence of endoleaks and changes in aneurysm size.

Exam Protocol: The endovascular aortic stent graft ultrasound exam consists of these components:

1. Abdominal aorta, iliac arteries, and stent graft gray scale imaging.
2. Spectral and Color Doppler evaluation of the abdominal aorta, iliac arteries, and the stent graft. The origins of the renal arteries are evaluated with color and spectral Doppler to confirm patency. In patients that have a Fenestrated AAA Endovascular Graft the origin of the SMA and the proximal 4 cm of the renal arteries are evaluated with color and spectral Doppler to confirm patency.
3. Evaluation of the aneurysm sac, the superior and inferior attachment sites, and the areas of the IMA and lumber arteries with color Doppler for possible endoleaks. All suspected leaks seen with color Doppler need to be confirmed with spectral Doppler.

***** All spectral Doppler images are taken with a Doppler angle of 60 degrees or less with the sample gate parallel to the vessel wall, NOT the flow jet.**

Imaging Protocol: The following images make up the endovascular aortic stent graft ultrasound exam:

Gray Scale Images

- Proximal aorta with longitudinal AP measurement
- Proximal aorta with transverse measurement
- Proximal graft landing site with longitudinal AP measurement
- Proximal graft landing site with transverse measurement
- Maximum aneurysm sac with longitudinal AP measurement
- Maximum aneurysm sac with transverse measurement
- Mid right common iliac artery with longitudinal AP measurement
- Mid right common iliac artery with transverse measurement
- Distal right graft landing site with longitudinal AP measurement
- Distal right graft landing site with transverse measurement
- Mid left common iliac artery with longitudinal AP measurement
- Mid left common iliac artery with transverse measurement
- Distal left graft landing site with longitudinal AP measurement
- Distal left graft landing site with transverse measurement

Color/Spectral Doppler Images

- Proximal aorta
- Proximal stent graft landing site
- Stent graft within aneurysm sac
- Right lateral sac outside the stent graft
- Left lateral sac outside the stent graft
- Mid right common iliac artery
- Distal right stent landing site
- Mid left common iliac artery
- Distal left stent landing site
- Right renal artery origin (color only or color w/spectral Doppler)
- Left renal artery origin (color only or color w/spectral Doppler)
- **The following additional images will be obtained in patients with fenestrated endografts:**
    - **SMA origin with color and angle-corrected spectral Doppler**
    - **Proximal 4 cm of the RRA with color and angle-corrected spectral Doppler**
    - **Proximal 4 cm of the LRA with color and angle-corrected spectral Doppler**

Evaluation of Leaks

Survey the entire graft, both the lumen and the aneurysm sac, in both longitudinal and transverse planes, with sensitive settings.

- Check IMA patency and direction of flow if present.
- All leaks seen with color Doppler should be confirmed with spectral Doppler.
- Determine the location of any leak and the origin of the leak if possible (lumbar arteries, IMA) and in-flow/out-flow.

References

1. GE Medical Systems, US: Emerging Vascular Technologies, Program Supplement. *Color Duplex Ultrasound Protocol for Evaluation of Endovascular Stent Grafts for the Repair of Abdominal Aortic Aneurysm*.
2. Carter, Kathleen A., et al.: *Doppler Waveform Assessment of Endoleak Following Endovascular Repair of Abdominal Aortic Aneurysm: Predictors of Endoleak Thrombosis*, The Journal of Vascular Technology 24(2): 119-122, 2000.
3. Johnson, Bonnie L., et al., *Color Duplex Evaluation of Endoluminal Aortic Stent Grafts*, The Journal of Vascular Technology 22(2): 97-104, 1998.

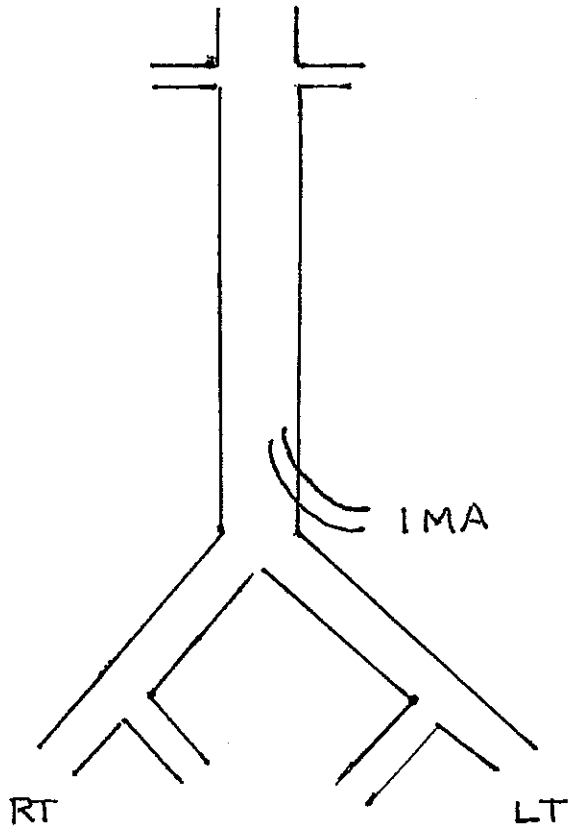
Endovascular Aortic Stent Worksheet

Name: _____ Date: _____

Clinic # _____ Surgeon: _____

Date of Stent Placement: _____ Graft u/s Study _____

Location	AP	Trans
Proximal Landing Site		
Max Sac		
RT mid CIA		
RT Distal Landing Site		
LT mid CIA		
LT Distal Landing Site		



Leak Present?	YES	NO

Impression:

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_____

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_____ **Sonographer** _____