ULTRASOUND – LVAD DRIVELINE EVALUATION

UT Southwestern Medical Center
Radiology

PURPOSE:
To evaluate the soft tissues surrounding the LVAD driveline for abnormalities, such as fluid collections.

SCOPE:
Applies to all ultrasound studies of the anterior abdominal wall in the region of the LVAD driveline performed in Imaging Services / Radiology.

INDICATIONS:
- Signs or symptoms of LVAD driveline infection
  - Erythema
  - Increased swelling or tenderness surrounding exit site
  - Purulent drainage
- Abnormality on prior imaging

CONTRAINDICATIONS:
- No absolute contraindications

EQUIPMENT:
- Linear array transducers with a frequency range of 7-18 MHz. Sector or curvilinear transducers with a frequency range of 1-9 MHz may be required for appropriate penetration and resolution depending on patient's body habitus.

PATIENT PREPARATION:
- Scan using sterile technique (see below Technical Considerations).

EXAMINATION:

GENERAL GUIDELINES:

A complete examination includes entire sonographically visible drive line within the anterior abdominal wall.

EXAM INITIATION:
- Review any prior imaging, making note of abnormalities.
- Introduce yourself to the patient/family.
- Verify patient identity using patient name and DOB.
- Explain test.
- Obtain patient history including symptoms. Enter and store data page.
- Place patient in supine position.

TECHNICAL CONSIDERATIONS:
- Patient habitus may limit visualization of the deep segments of the driveline. Use of PEN mode or a curved transducer may be needed.
- STERILE TECHNIQUE SHOULD BE UTILIZED:
  - Utilize sterile gel packets.
  - Utilize sterile probe cover.
  - Utilize sterile gloves.
  - Utilize sterile gauze.

DOCUMENTATION:

- Start at insertion site, keeping sterile technique within 2 cm of insertion.
  - TRANSVERSE:
    - Driveline at skin exit site
    - 2 cm from insertion site
    - Cine clip from insertion to 2 cm
  - LONG:
    - Driveline from exit site to 2 cm
  - If fluid collection or hypoechoic material identified:
    - TRV: Measure greatest thickness, and annotate distance from skin surface
    - LONG: Measure length of collection/material along driveline, annotating deepest extent
    - Cine loop in TRV through any collection/material

- Pause imaging at this point. Remove gel with sterile gauze, replace sterile bandage, and secure with tape.

- Proceed with imaging of deeper segments:
  - Transverse:
    - 4 cm from incision site
    - 6 cm from incision site
    - 8 cm from incision site
    - 10 cm from incision site
    - Continue until not seen.
  - Cine loops from 2 cm to deepest visible segment
  - LONG:
    - Driveline from 2 cm to deepest aspect (until not seen)
  - If fluid collection or hypoechoic material identified:
    - TRV: Measure greatest thickness, and annotate distance from skin surface
    - LONG: Measure length of collection/material along driveline, annotating deepest extent
    - Cine loop in TRV through any collection/material

PROCESSING:

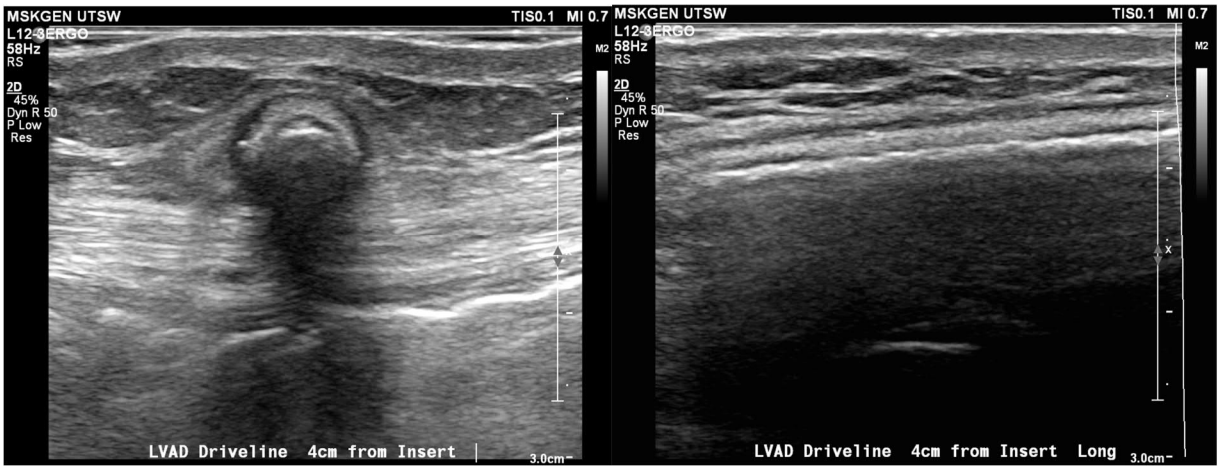
- Review examination images and data
- Export all images to PACS
- Document relevant history and any study limitations.

REFERENCES:

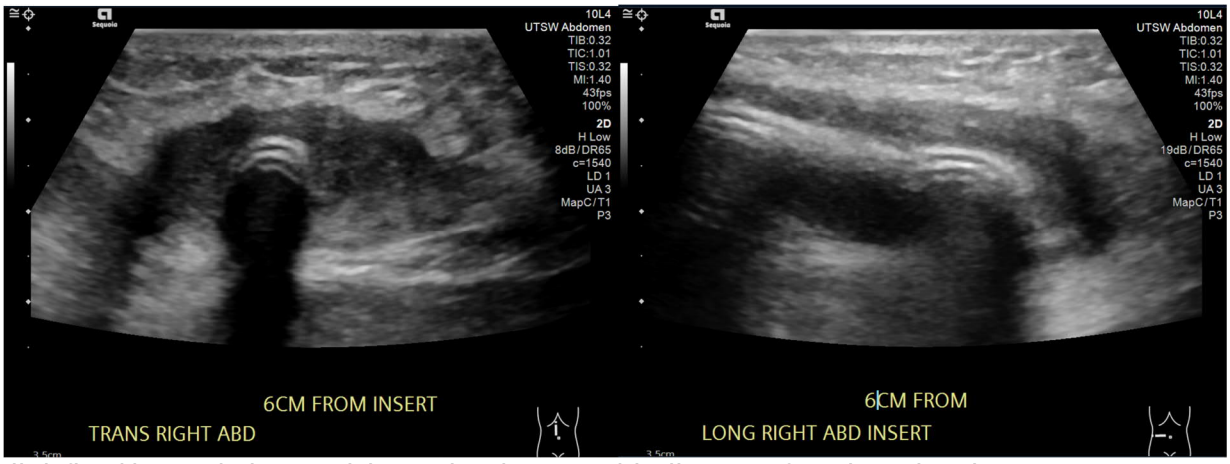
- Left ventricular assist device driveline infections: Recent advances and future goals. Ann-Marie Lueck. J. Thorac Dis. 2015 Dec, 7 (12): 2151-2157 doi 10.3978/j.issn.2072-1439. 2015.11.06. ncbi.nlm.nih.gov/pmc./articles/pmc4703684

CHANGE HISTORY:

STATUS	NAME & TITLE	DATE	BRIEF SUMMARY
Submission	Monica Morgan, RDMS, RVT Allyson LaSalle, RDMS, RVT	5/27/2020	Submitted
Approval	David Fetzer, MD	5/30/2020	Approved
Review	Skye Smola, RDMS, RVT	9/3/2025	
	Hilary Allen, RDMS, RVT	9/3/2025	Reviewed content with LVAD team. Added Parkland logo. Corrected spelling error.
Submitted	Hilary Allen, RDMS, RVT	10/13/2025	Sample images added



Normal appearance of LVAD driveline 4 cm from insertion site



Ill-defined hypoechoic material encasing the LVAD driveline 6 cm from insertion site