TRA MEDICAL IMAGING
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Ultrasound Protocol: Groin Hernia

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List of Required Images

NOTES: Assess focal area of concern using a high frequency linear array transducer. This exam is a limited extremity, unilateral unless ordered bilaterally. Worksheet documentation of each hernia requires all 4 features described below.

GROIN EVALUATION

- **Transverse** – Complete documentation to include:
  - Images of area of interest **at rest,** minimum 1.
  - Images of area of interest **with Valsalva,** minimum 1.
  - CINE **at rest** superior-inferior through AOI (if hernia seen, perform as described below).
  - CINE **with Valsalva** at AOI, probe stationary (if hernia seen, perform as described below).
- **Sagittal** - Complete documentation to include:
  - Images of area of interest **at rest,** minimum 1.
  - Images of area of interest **with Valsalva,** minimum 1.
  - CINE **at rest** lateral-medial through AOI (if hernia seen, perform as described below).
  - CINE **with Valsalva** at AOI, probe stationary (if hernia seen, perform as described below).

ADDITIONAL IMAGES IF HERNIA SEEN

- **Transverse** – Complete documentation to include:
  - Measure defect/neck width.
  - Measure hernia sac width at maximum during rest or if the hernia is only present with Valsalva, then measure during Valsalva.
  - For **inguinal hernia**, images of hernia in relation to inferior epigastric vessels with and without color Doppler. Label IEV, Medial, and Lateral on image.
  - For **femoral hernias**, images of hernia in relation to femoral vein with and without color Doppler. Label FV on image.
  - CINE **at rest** superior-inferior through hernia neck and contents.
  - CINE **with Valsalva** at hernia neck assessing change in contents and mobility, probe stationary.
  - **Assess for Reducibility** – CINE in either Transverse or Sagittal with compression showing amount of reducibility.
- **Sagittal** - Complete documentation to include:
  - Measure defect/neck superior-inferior.
  - Measure hernia sac contents length and AP at maximum during rest or if the hernia is only present with Valsalva, then measure during Valsalva.
  - CINE **at rest** lateral-medial through hernia neck and contents.
  - CINE **with Valsalva** at hernia neck assessing change in contents and mobility, probe stationary.

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- **Assess for Reducibility** – CINE in either Transverse or Sagittal with compression showing amount of reducibility.

Document 4 features – detail on sonographer worksheet:

- **Contents** of hernia sac: fat, bowel, fluid, any additional anatomy.
- **Size** of hernia defect (neck): transverse x sagittal.
- **Size** of total hernia sac in 3 dimensions. If hernia is reducible, then measurements should be during Valsalva.
- **Reducibility**: Describe as ONE of the following
  - Not reducible
  - Partially reducible
  - Reducible with pressure
  - Spontaneously reducible

If any of the above are unclear, please note that on the worksheet.

S/P hernia repair without recurrent hernia: assess visible portions of mesh, including the edges.

- Add 1 image in either Transverse or Sagittal at edge of mesh.
- Add 1 CINE in either Transverse or Sagittal during Valsalva at edge of mesh.

Lymph Nodes: If palpable concern corresponds to inguinal lymph node(s), and/or if incidental lymph node(s) seen:

- Measure single largest node in 3 dimensions.
- Color Doppler image of largest node.
- Representative sagittal and transverse images, if several nodes are in area.

Mass: If palpable concern corresponds to a mass, document per Pathology Protocol.

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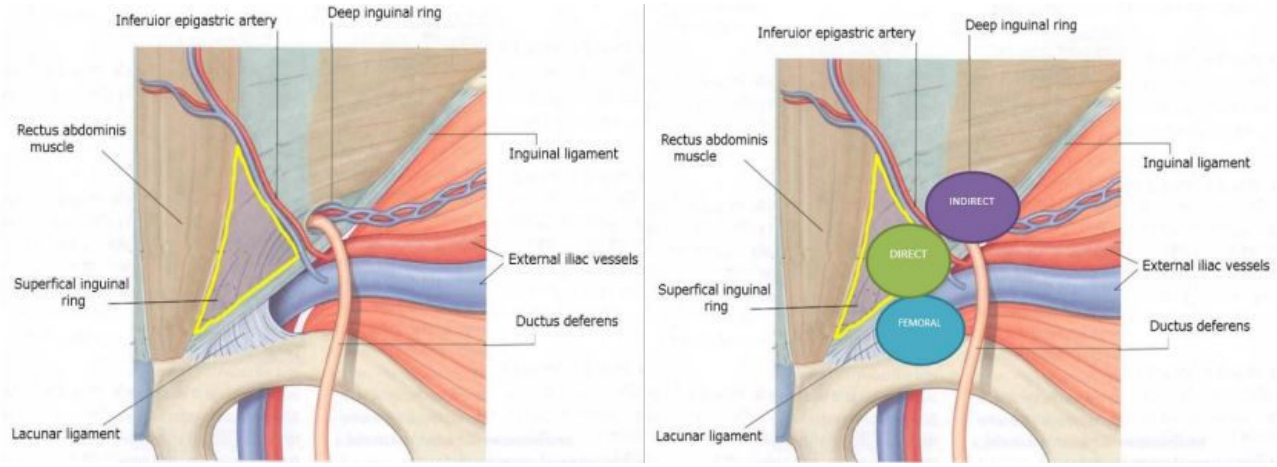
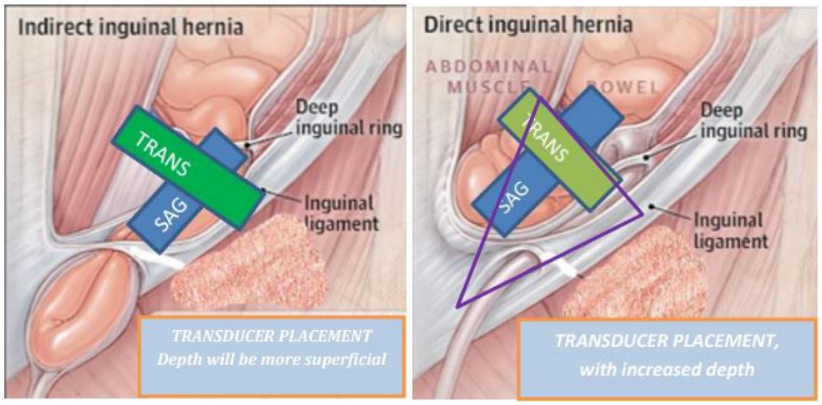
Specific Considerations for the Groin Hernia Protocol

NOTES of specific hernia types:

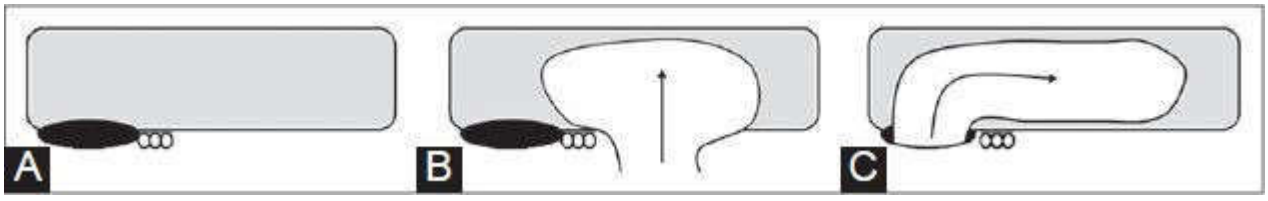


Left Groin

Inguinal Hernia



Left Groin



Right Groin

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Simplified diagram of a long axis view through the right inguinal canal.

(A): The deep inferior epigastric vessels (three circles) lie at the medial aspect of the deep inguinal ring (black oval)

(B) Direct inguinal hernias originate medially to the inferior epigastric vessels

(C) Indirect inguinal hernias pass through the deep ring laterally and then over the inferior epigastric vessels

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Femoral Hernia: Scan below the inguinal ligament and MEDIAL to femoral vein. Remain lateral to the pubic tubercle. A femoral hernia typically compresses the femoral vein.

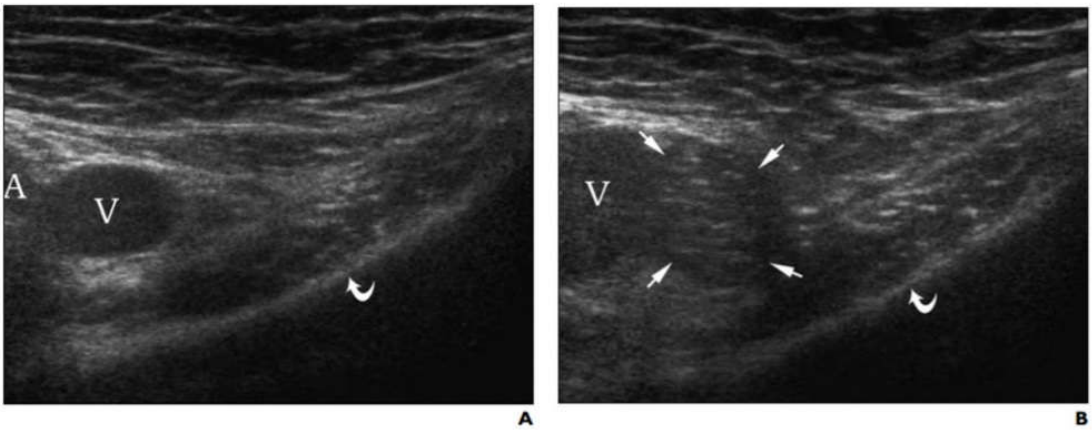

Fig. 10—31-year-old woman with femoral hernia. Sonogram of right inguinal region parallel to and caudad to inguinal ligament corresponding to transducer position 4 in Figure 4.
A, Pre-Valsalva maneuver sonogram shows (hernia not visible) femoral artery (A), femoral vein (V), and superior pubic ramus (*curved arrow*).
B, Post-Valsalva maneuver sonogram shows dilated femoral vein (V) lateral to femoral hernia (*arrows*). Superior pubic ramus (*curved arrow*) is also seen.

Right Groin

Common Indications for Groin Hernia Ultrasound

- Groin bulge, mass, or pain.