

## **Procedure Name: Scrotal/Testicular Complete**

Updated: 03/23/2023

### **Indications:**

May include but not limited to evaluation of scrotal asymmetry and location (intra or extra testicular) and characteristics of scrotal masses, suspected complications of inflammatory disease such as scrotal/testicular abscess, evaluation of scrotal trauma, evaluation of scrotal pain of undetermined etiology, detection of varicoceles in infertile men or for any other valid medical reason. There are no absolute contraindications.

### **General Description:**

A complete examination of the scrotal region for adults and children includes assessment and imaging of the complete scrotal contents and localization of undescended testis/testes.

### **Patient Preparation:**

None required

### **Equipment Selection and Settings:**

Select Scrotal from preset menu

A linear 6.0 to 15.0MHz probe will be used for most patients. The linear 9.0 MHz probe can be used for ore depth and for more powerful Doppler. In infants, the hockey stick probe can be useful. The sonographer should use the preprogrammed setting for the appropriate body part and adjust gain, depth and transmit zone settings to optimize images. Fill out any applicable impression or worksheet upon completion of exam.

### **Imaging Sequence:**

Follow the image sequence below in order.

The following imaging sequence is for a normal exam. Include additional images of pathology to demonstrate dimensions in three planes (craniocaudal, AP and transverse), texture, size, shape, and relationship to adjacent anatomy. If you cannot locate one of the testes or find a solid or complex cystic mass, notify radiologist before releasing patient.

- Image patient data (demographics page)
- Ask patient which side is symptomatic, start with symptomatic side after TRANS MIDLINE images are obtained. If patient has no localizing symptoms, proceed with the image order as listed below (right first then left).

### **TRANS MIDLINE**

1. Trans gray-scale image of both testes mid-testis position in same frame (or dual screen) for lie and echo texture. (If testis is undescended locate it between the top of the scrotum and the inferior pole of the ipsilateral kidney. Obtain images of it as below and document the location on the images and using the undescended testes worksheet in addition to the scrotal worksheet.)
2. Transverse color Doppler image of both testes at mid-testis position.
3. While holding the probe stationary in the transverse position, take a 3-second cine clip of both testes side-by-side to show real-time intrinsic color Doppler flow.

### **MEASUREMENTS**

1. RT testis w/measurements in three dimensions (long, AP and trans) and volume calculation. AP measurement should be the first measurement on the transverse image. If the volume measurement in the ultrasound machine does not use the formula  $L \times W \times H \times 0.71$  Lambert's formula, this will need to be hand calculated on the worksheet.
2. LT testis w/measurements in three dimensions (long, AP and trans) and volume calculation. AP measurement should be the first measurement on the transverse image. If the volume measurement in the ultrasound machine does not use the formula  $L \times W \times H \times 0.71$  Lambert's formula, this will need to be hand calculated on the worksheet.

### **RIGHT**

1. RT LONG spermatic cord from internal ring to base of scrotum gray-scale and color images.

2. Cine sweep RT LONG spermatic cord.
3. RT epididymal head (measure in three dimensions), document relationship to superior pole of testis.
4. RT epididymal body
5. RT epididymal tail
6. RT epididymis with color flow
7. RT TRANS testis superior, mid, inferior
8. Cine sweep RT TRAN testis.
9. RT LONG testis lateral, mid, medial
10. Cine sweep RT LONG testis.
11. RT testicular spectral waveforms to evaluate for venous and arterial flow. Arterial waveforms should be central in the testis. Use angle correction and calculate resistance index on most central tracing. If unable to demonstrate venous flow, need arterial waveforms from at least 3 different central areas of the testis. Doppler of peripheral testicular arteries is not sufficient.
12. Evaluate RT para-testicular veins for varicocele with and without color Doppler imaging, with and without Valsalva.
13. Obtain measurements of the para-testicular veins suspected as enlarged (greater than 2mm) both prior to and during Valsalva without color or power Doppler. Be sure to annotate the images indicating the phase in which you acquired it. These are to be saved without color or Doppler overlay to aid in caliper placement for the measurements.

#### **LEFT**

1. LT LONG spermatic cord from internal ring to base of scrotum gray-scale and color images.
- 2.. Cine sweep LT LONG spermatic cord.
3. LT epididymal head (measure in three dimensions), document relationship to superior pole of testis.
4. LT epididymal body
5. LT epididymal tail
6. LT epididymis with color flow
7. LT TRANS testis superior, mid, inferior
8. Cine sweep LT TRAN testis.
9. LT LONG testis lateral, mid, medial
10. Cine sweep RT LONG testis.
11. LT testicular spectral waveforms to evaluate for venous and arterial flow. Arterial waveforms should be central in the testis. Use angle correction and calculate resistance index on most central tracing. If unable to demonstrate venous flow, need arterial waveforms from at least 3 different central areas of the testis. Doppler of peripheral testicular arteries is not sufficient.
12. Evaluate LT para-testicular veins for varicocele with and without color Doppler imaging, with and without Valsalva.
13. Obtain measurements of the para-testicular veins suspected as enlarged (greater than 2 mm) both prior to and during Valsalva without color or power Doppler. Be sure to annotate the images indicating the phase in which you acquired it. These are to be saved without color or Doppler overlay to aid in caliper placement for the measurements.

#### **WORKSHEETS**

1. Document any "whirlpool" sign or mass with transverse and longitudinal cine sweeps.
2. Volumes: If the volume measurement in the ultrasound machine does not use the formula  $L \times W \times H \times 0.71$  (Lambert's formula), this will need to be hand calculated on the worksheet.

3. Must provide patient height and weight for all pediatric patients. The height and weight are used to assess testicular sizes.

## **PATHOLOGY**

In case of a solid or cystic mass or other pathology obtain longitudinal and transverse grayscale and color Doppler images and perform spectral analysis of internal vessels.

Note on worksheet if epididymis is ectopic in location or if testis orientation is not as demonstrated in diagram on worksheet as seen here:



### References:

- Klinke M, Elrod J, Stiel C, Ghadban T, Wenskus J, Herrmann J, Junge CM, Reinshagen K, Boettcher M. [The BAL-Score Almost Perfectly Predicts Testicular Torsion in Children: A Two-Center Cohort Study.](#) Front Pediatr. 2020 Dec 7;8:601892. doi: 10.3389/fped.2020.601892. PMID: 33365292; PMCID: PMC7750324.
- Bandarkar AN, Blask AR. [Testicular torsion with preserved flow: key sonographic features and value-added approach to diagnosis.](#) Pediatr Radiol. 2018 May;48(5):735-744. doi: 10.1007/s00247-018-4093-0. Epub 2018 Feb 21. PMID: 29468365; PMCID: PMC5895684. **This reference has fantastic videos as supplementary material.**
- Galina P, Dermentzoglou V, Baltogiannis N, Zarifi M. [Sonographic appearances of the epididymis in boys with acute testicular torsion but preserved testicular blood flow on color Doppler.](#) Pediatr Radiol. 2015 Oct;45(11):1661-71. doi: 10.1007/s00247-015-3375-z. Epub 2015 Jun 24. PMID: 26104655.
- Kalfa N, Veyrac C, Baud C et al (2004) [Ultrasonography of the spermatic cord in children with testicular torsion: impact on the surgical strategy.](#) J Urol 172:1692–1695
- Liu C, Liu X, Zhang X, Yang B, Huang L, Wang H, Yu H. [Referential Values of Testicular Volume Measured by Ultrasonography in Normal Children and Adolescents: Z-Score Establishment.](#) Front Pediatr. 2021 Mar 11;9:648711. doi: 10.3389/fped.2021.648711. PMID: 33777868; PMCID: PMC7991569.