14 year old boy with bicycle–related straddle injury presents with left scrotal pain, erythema and edema. Based on the ultrasound images, what is the most important diagnosis from the urologist’s perspective?

- **Answer is D.**
- Longitudinal and transverse images of the left scrotum show an enlarged heterogeneous left testicle with indistinct lower testicular margin indicating disruption of the echogenic linear tunica albuginea surrounding the testicle, confirming testicular rupture. Adjacent heterogeneously echogenic material likely represents extruded testicular material as well as associated extratesticular hematoma/hematocele and more peripheral less complex hydrocele.
- **Option A is not correct.** Testicular torsion should always be kept in mind when interpreting a post-traumatic scrotal ultrasound as torsion may coexist. Decreased or absent intra-testicular Doppler flow, abnormal transverse lie of the testicle or absent cremasteric reflex should raise suspicion for testicular torsion. No Doppler flow images are included with this question; therefore evaluation of testicular perfusion and torsion cannot be made.
- **Option B is not correct.** Although the testicle is heterogeneous, no focal intratesticular hematoma is visible on the provided images. Testicular hematoma is usually focal, but may be multiple, and may be hyperechoic (in acute bleeding) or hypoechoic (as the hemorrhage ages) and lacks vascularity. Although testicular hematoma may coexist with testicular rupture, if present alone with maintained adjacent testicular perfusion, is treated non-operatively.
- **Option C is not correct.** Testicular infarction is identified by lack of blood flow within the testicle on color Doppler imaging and may coexist with testicular rupture. No color Doppler images were included in this question, therefore it is not possible to evaluate for this.
- **Option D is correct.** In testicular rupture, there is hemorrhage and extrusion of testicular contents into the scrotal sac. Discontinuity of the echogenic tunica albuginea is indicative of testicular rupture and necessitates emergent surgery in most urologist’s training and experience (although a conservative approach has been advocated in some instances recently).
- **Option E is not correct.** Hematocele, a complex collection containing blood that separates the visceral and parietal layers of the tunica vaginalis, is acutely echogenic and becomes more complex and more hypoechoic with age. Although present here, this is not the salient finding that will alter urologic management.

References
2014 SPR PG Course

SAM 2: Scrotal injury two weeks ago; persistent pain and swelling but no fever. What is the leading diagnosis and appropriate management?

A. Testicular hematoma, Ultrasound follow-up
B. Testicular hematoma, observation only
C. Testicular abscess, antibiotic therapy
D. Testicular abscess, orchietomy
E. Testicular neoplasm, Ultrasound follow-up
F. Testicular neoplasm, orchietomy

2014 SPR PG Course

14 year old boy with bicycle–related straddle injury presents with left scrotal pain, erythema and edema. Based on the ultrasound images, what is the most important diagnosis from the urologist’s perspective?

- **Answer is A.**

- Longitudinal and transverse ultrasound images of the right testicle (and left testicle included on transverse gray scale image) without and with color Doppler show focal heterogeneous echogenicity (with several septated cystic components in addition to solid component) in the upper right testicle anteriorly with decreased flow, relative to the remainder of the right testicle, and left testicle. There is a background of testicular microcystic change bilaterally and anterior right scrotal edema.

- **Option A is correct.** Testicular hematoma is usually focal, but may be multiple, and may be hyperechoic (acutely) or hypoechoic (as the hemorrhage ages) and lacks vascularity. Given the history of trauma, the most likely diagnosis is testicular hematoma, however the differential diagnosis includes neoplasm and less likely focal infarction or focal orchitis/abscess. Therefore ultrasound follow up is indicated and will show evolution and decreased size of hematoma over time (whereas a neoplasm will not change or slightly increase in size). The lack of internal vascularity is helpful as most intra-testicular tumors greater than 1cm in size will have internal vascularity with color Doppler imaging.

- **Option B is not correct.** Testicular hematoma is the correct answer; however observation only instead of follow up testicular ultrasound is incorrect. Follow up ultrasound is indicated for reasons stated in option A response above.

- **Option C is not correct.** Testicular abscess could have this imaging appearance; however, the history stated that this patient does not have fever. This highlights the importance of correlating the imaging findings with clinical history, as often there may be no provided history of trauma or minor trauma may have been forgotten. If there was clinical concern for testicular infection (fever, white blood cell elevation, elevated inflammatory markers), antibiotics would be the correct initial treatment.

- **Option D is not correct.** As stated in option C response above, testicular abscess could have this imaging appearance but does not correlate with the provided history. However, orchietomy would not be the initial management for focal testicular infection.

- **Option E is not correct.** Intratesticular hematoma may be mistaken for a primary testicular malignancy by ultrasound if a detailed clinical history is not correlated. There is a differential diagnosis for an intratesticular lesion, as stated in option A response above. Follow up ultrasound is indicated, with orchietomy performed if the lesion does not evolve and retract over time, as would be expected with an intratesticular hematoma.

- **Option F is not correct.** Intratesticular hematoma may be mistaken for a primary testicular malignancy by ultrasound if a detailed clinical history is not correlated. There is a differential diagnosis for an intratesticular lesion, as stated in option A response above. Follow up ultrasound is indicated, with orchietomy performed if the lesion does not evolve and retract over time, as would be expected with an intratesticular hematoma.

References

14 year old boy with bicycle–related straddle injury presents with left scrotal pain, erythema and edema. Based on the ultrasound images, what is the most important diagnosis from the urologist’s perspective?

- **Option C is not correct.** Testicular abscess could have this imaging appearance; however, the history stated that this patient does not have fever. This highlights the importance of correlating the imaging findings with clinical history, as often there may be no provided history of trauma or minor trauma may have been forgotten. If there was clinical concern for testicular infection (fever, white blood cell elevation, elevated inflammatory markers), antibiotics would be the correct initial treatment.

- **Option D is not correct.** As stated in option C response above, testicular abscess could have this imaging appearance but does not correlate with the provided history. However, orchietomy would not be the initial management for focal testicular infection.

- **Option E is not correct.** Intratesticular hematoma may be mistaken for a primary testicular malignancy by ultrasound if a detailed clinical history is not correlated. There is a differential diagnosis for an intratesticular lesion, as stated in option A response above. Follow up ultrasound is indicated, with orchietomy performed if the lesion does not evolve and retract over time, as would be expected with an intratesticular hematoma.

- **Option F is not correct.** Intratesticular hematoma may be mistaken for a primary testicular malignancy by ultrasound if a detailed clinical history is not correlated. There is a differential diagnosis for an intratesticular lesion, as stated in option A response above. Follow up ultrasound is indicated, with orchietomy performed if the lesion does not evolve and retract over time, as would be expected with an intratesticular hematoma.

References

SAM 3: 2 year old with left scrotal pain. Left blood flow is:

A. Normal
B. Decreased
C. Increased
D. Indeterminate

References
Two year old with left scrotal pain. Blood flow on the left is:

- **Answer:** B
- **Rationale:** Images demonstrate blood flow to both testes with power and color Doppler. Spectral Doppler demonstrates an asymmetric appearance with a low resistance pattern on the symptomatic left side. A small left hydrocele is also partially visualized. Option A is not correct because the flow is asymmetric. Option C is not correct because the flow is diminished on the symptomatic side. Option D is not correct because there is decreased flow on the side of clinical concern.

The most likely diagnosis for this child is:

- **Correct answer C.**
- **Rationale:** Images demonstrate blood flow to both testes with power and color Doppler. Spectral Doppler demonstrates an asymmetric appearance with a low resistance pattern on the symptomatic left side. A small left hydrocele is also partially visualized. The patient was taken to surgery and there was testicular torsion with a 360 degree twist in the spermatic cord. Option A is not correct because there is decreased flow on the symptomatic side. Option B is not correct because the testicular appendage is not demonstrated in the given images and because the flow is diminished on the symptomatic side. Option D is not correct because the testicles are both intact.

**References**

SAM 4: The most likely diagnosis for this child is:

A. Normal
B. Torsed appendix testis
C. Testicular torsion
D. Testicular fracture

SAM 5: Teenager with 8 hours right scrotal pain. Which is true?

A. The diagnosis of left testicular torsion is clear.
B. Left testis viability is likely.
C. Indications for manual detorsion are well-supported by clinical context and sonographic features.
D. Detorsion should be monitored by CDU.
E. All of the above.
Teenager with 8 hours scrotal pain Which is true?

- **Answer is E.** The sonographic diagnosis of torsion is based upon the triad of:
  - testicular swelling
  - knot sign (visibility of the coiled cord)
  - absence of testicular flow at CDU
- Testicular viability can be inferred from the preservation of the normal echotexture.
- Preoperative manual detorsion can restore testicular perfusion in cases when time delay (duration of torsion, access to operating room) is an additional threat to subsequent testicular viability. In the presented case, the abnormal contralateral testis was a further clinical incentive for immediate action.

**References**

Subsequent management must be:

- **Answer is E.**
- Manual detorsion is not a substitute for exploration and fixation, and immediate bilateral orchidopexy remains imperative. Indeed, residual torsion can still be present at surgery despite restoration of flow at CDU. Moreover, the underlying anatomic predisposition (bell-clapper deformity) is a definite risk factor for torsion recurrence, ipsilateral or contralateral.

**References**

SAM 6: Subsequent management must be:

A. Conservative with close clinical monitoring
B. Conservative with close US surveillance
C. Discharge from the emergency room
D. Elective surgery
E. Rapid surgical exploration and bilateral orchidopexy

SAM 7: 14-year-old genetic and phenotypic boy. Most likely diagnosis?

A. Seminoma
B. Testicular tumor of adrenogenital syndrome
C. Nonseminomatous germ cell tumor
D. Lymphoma
E. Orchitis
14-year-old boy. Which is the most likely diagnosis?

• US demonstrates multiple bilateral hypoechoic nodules clustered around the mediastinum testis which are traversed by vessels on the color Doppler image. These are the characteristic findings of testicular tumor of adrenogenital syndrome which is typically bilateral.

• Option A is not correct. Seminomas are rare in the pediatric population, are typically unilateral, and exert mass effect. Bilateral seminomas may occur in adult patients with abdominal or pelvic gonads in some patients with DSD. These testes are in the scrotum.

• Option B is correct. Testicular tumors of adrenogenital syndrome typically are bilateral, cluster around the mediastinum testis, hypoechoic when small, and do not exert mass effect on vessels which traverse through the masses. When large, the testicular tumors may appear hyperechoic with posterior acoustic shadowing.

• Option C is not correct. Nonseminomatous germ cell tumors are typically heterogeneous in echotexture, almost always unilateral and exert mass effect, although bilateral germ cell tumors may occur in abdominal or pelvic gonads in some patients with DSD. These testes are in the scrotum.

• Option D is not correct. Although lymphoma is often bilateral, the testes are diffusely infiltrated and enlarged with disorganized increased vascularity, while these testes show bilateral small focal masses clustered around the mediastinum testis.

• Option E is not correct. Orchitis is typically unilateral, with ill-defined hypoechoogenicity and increased flow. The epididymis is also enlarged and hypoechoic with increased flow.


SAM 8: 4 year old female with 72 hours right lower quadrant pain. What is true?

A. There is a right adnexal cystic mass.
B. There is a right adnexal enhancing solid mass.
C. There is right adnexal torsion.
D. There may be a right ovarian torsion but this needs confirmation with ultrasound.
E. There is right ovarian edema due to an extra-ovarian cause such as appendicitis.

A four-year-old female with right lower quadrant pain for 72 hours. Which of the following is true?

• Answer: C
• Rationale: The most common imaging finding suggestive of an adnexal torsion is asymmetrical enlargement of the ovary (>5cm or 5-6 times larger than the contralateral ovary) with multiple peripheral cysts with or without an associated mass. A twisted vascular pedicle is the most specific and diagnostic finding of an ovarian torsion. The twisted vascular pedicle appears as a “whirlpool” sign of concentric vessels. Both of these findings are seen in this case (option C is the correct answer).

• There is no solid or cystic mass in the ovary and the enhancing structure in the right ovary is the twisted vascular pedicle (A and B are not correct).
A four-year-old female with right lower quadrant pain for 72 hours. Which of the following is true?

- The diagnostic performance of CT is similar to US in identifying ovarian torsion and identification of the torsed pedicle is diagnostic. If a CT exam demonstrates findings of ovarian torsion another imaging exam (i.e. US) may delay therapy and is unlikely to improve preoperative diagnostic yield (option D is not correct).
- Although an inflamed appendix or Meckel's diverticulum can be closely related to an ovary and cause reactive inflammation and edema there are no findings to suggest this (option E is not correct). Findings are conclusive of ovarian torsion.

**References**

**A 16-year-old female with right lower quadrant pain for 18 hours. Which of the following is true?**

- **Answer:** E
- Periadnexal fat stranding is suggestive of an underlying infectious etiology.
- Torsion of the adnexa may involve the ovary (~31%), the fallopian tube (~10%), or both (~59%). The clinical presentation is usually indistinguishable and accurate imaging diagnosis is very difficult especially in isolated tubal torsion. In this case there is enlargement of the ovary, twisted ovarian pedicle and cystic enlargement of the tube with "beak sign" suggesting simultaneous torsion of the tube and the ovary (Option B is a correct statement and option C is an incorrect statement). Most common cause of isolated tubal torsion is a tubal or paratubal cyst.
- A normal ovary can torque due to disproportionately elongated utero-ovarian ligament; jarring movements of a relatively large ovary in a small infant; and associated Mullerian anomalies (Option D is an incorrect statement).
- The uterine deviation towards the site of the torsion occurs due to shortening of the utero-ovarian ligament and tube. Hence, the deviation is the result of the torsion and not the cause (Option E is an incorrect statement).

**References**
Touch the finding in this VCUG that indicates the presence of Mullerian duct structures

- The image shows abnormal filling of a tubular structure posterior to the urethra as well as the urethra and bladder. The superior cervical impression on this structure, representing the vagina in a patient with UG sinus, indicates the presence of mullerian structures in this patient.


Sagittal pelvic US in a newborn with ambiguous genitalia. Touch the uterine cervix.

You are shown a sagittal ultrasound image of the pelvis in a newborn with ambiguous genitalia. Please indicate the uterine cervix.

Answer:
9-year-old female with RLQ pain. Please indicate the portion of the lesion that is diagnostic.

- Diagnosis: mature ovarian teratoma
- Explanation: Teratomas are neoplasms defined by the presence of tissue from all three primitive cell lines—endoderm, mesoderm, and ectoderm. While many neoplasms originating in the ovary may have cystic or calcified components, teratomas are the only one that contains fat.

A 17 year old girl with hirsutism. Please point out the abnormality.
A 17 year old girl with hirsutism has a pelvic MR performed. Please point out the abnormality.

- **DIAGNOSIS:** Enlarged left ovary with peripheral cysts and central stromal prominence is consistent with polycystic ovarian morphology
- **EXPLANATION** of the correct answer: MRI demonstrates an enlarged ovary with more than 12 follicles similar in size measuring 2-9 mm. The distribution is peripheral with a “string of pearls” appearance. The central stroma is prominent. In this patient with hirsutism and polycystic ovarian morphology (PCOM), PCOS should be considered in the differential.

References

Undescended testis. The most likely diagnosis based on the appearance of the vas and internal spermatic vessels is

- **Answer is B.**
- The laparoscopic image shows atretic vas and vessels. After making this observation, the diagnosis is absent testis.
- **Option B is correct.** The diagnosis is absent testis. No further exploration is necessary. This is different from the situation where cord structures enter the internal inguinal ring which mandates an exploration. An atrophic testis within the canal should be resected because of its risk for testicular cancer. A normal testis may occasionally be identified in the canal in obese patients or when the internal inguinal canal is open and the increased intraabdominal pressure from CO₂ insufflation pushes a low abdominal testis into the inguinal canal.
- **Option A is not correct.** The vas and vessels are not normal in appearance.
- **Option C is not correct.** The vas is not normal in appearance.
- **Option D is not correct.** The vessels are not normal in appearance.

References

SAM 10: Undescended testis. The most likely diagnosis based on the appearance of the vas and internal spermatic vessels is

- A. Normal vas and vessels entering the canal – inguinal testis.
- B. Atretic vas and vessels – absent testis.
- C. Normal vas and atretic vessels – high intraabdominal testis.
- D. Atretic vas and normal vessels – low intraabdominal testis.

SAM: Laparoscopic findings for intraabdominal testis that necessitate a two stage Fowler-Stephens orchiopexy include

- A. Being able to maneuver the testis to the contralateral internal inguinal ring.
- B. Seeing an atrophic testis with a diminutive vascular cord.
- C. Identifying a testis with a vascular cord that will not reach the scrotum.
- D. Finding normal cord structures entering the internal inguinal ring.
Laparoscopic findings for intraabdominal testis that necessitate a two stage Fowler-Stephens orchiopexy include

• **Answer is C.**
• **Option C is correct.** A testis with a vascular cord that will not reach the scrotum requires a two stage orchiopexy. The risk of testicular loss is high if the blood vessel supplying the vas is stretched too much. Therefore a conventional or single stage procedure is not performed.
• **Option A is incorrect.** If the testis is can be displaced to the contralateral inguinal ring, the vascular cord is long enough for a conventional orchiopexy.
• **Option B is incorrect.** An atrophic testis is usually resected.
• **Option D is incorrect.** Normal cord structures entering the internal inguinal ring indicate that a testis or remnant is in the inguinal canal. A standard orchiopexy can be performed. A remnant can be resected.

References


In this newborn with ambiguous genitalia and nonpalpable testes, what US feature confirms the gender?

- **DIAGNOSIS or FINDING TO BE MADE:** A testis is present in the left inguinal region. No uterus is seen posterior to the bladder
- **EXPLANATION of the correct answer:** This patient has a disorder of sexual differentiation with microphallus and no palpable testes in the scrotum. On sonography, a testis is seen in the left inguinal region and there is no uterus. Therefore, the patient is male.

SAM: 14 year old with 6 week follow-up US for a large hemorrhagic adnexal cyst. Current scan is in the first half of the menstrual cycle. How should this lesion be managed?

A. Surgical consult due to size.
B. MRI with and without contrast for mural nodule.
C. Continued US follow-up in 6 weeks to assess for resolution.
D. No follow-up is necessary as finding is not abnormal.
14-year-old with 6 week followup ultrasound for large hemorrhagic cyst. Current scan is in the first half of the menstrual cycle. How should this lesion be managed?

- Answer is D.
- The image demonstrates a dominant ovarian follicle containing a well-defined curved line at the periphery representing the cumulus oophorus of a mature ovum.
- Option A is not correct. The finding is physiologic and does not require surgery. A simple ovarian cyst, otherwise asymptomatic, must persist for several menstrual cycles and be larger than 7 cm to be considered surgical.
- Option B is not correct. The peripheral cyst within the follicle is not a solid lesion and, therefore, not a mural nodule.
- Option C is not correct. A normal finding does not require follow-up.
- Option D is correct. Dominant follicles can measure up to 3 cm in diameter. The peripheral cyst within the follicle represents the mature ovum. This configuration is seen just prior to ovulation.

References:

SAM: 14-year-old girl with RLQ pain shows a complex lesion (arrow) without internal vascular flow. How should this lesion be managed?

- Answer A is correct.
- The image shows a complex lacy lesion within a solid mass without internal vascular flow. The right ovary was not otherwise seen. At surgery, the lesion was a torsed right ovary with internal hemorrhage.
- Option A is correct. An enlarged solid lesion without vascular flow causing pain in a young female should raise suspicion for torsion when the ovary is not otherwise seen. Surgical consult is warranted.
- Option B is not correct. While an ovarian lesion of any type may be present, serving as a lead point for torsion, the patient’s symptoms coupled with the ultrasound finding make surgery rather than further imaging the correct next step in management.
- Option C is not correct. The lack of vascular flow in a solid lesion that could be the ovary puts torsion in the differential considerations. Torsion is an emergency, and imaging follow up in 6 weeks is not appropriate management at presentation.
- Option D is not correct. The finding is abnormal so further management is required.

References:

14-year-old girl with RLQ pain shows a complex lesion (arrow) without internal vascular flow. How should this lesion be managed?

- Answer A is correct.
- The image shows a complex lacy lesion within a solid mass without internal vascular flow. The right ovary was not otherwise seen. At surgery, the lesion was a torsed right ovary with internal hemorrhage.
- Option A is correct. An enlarged solid lesion without vascular flow causing pain in a young female should raise suspicion for torsion when the ovary is not otherwise seen. Surgical consult is warranted.
- Option B is not correct. While an ovarian lesion of any type may be present, serving as a lead point for torsion, the patient’s symptoms coupled with the ultrasound finding make surgery rather than further imaging the correct next step in management.
- Option C is not correct. The lack of vascular flow in a solid lesion that could be the ovary puts torsion in the differential considerations. Torsion is an emergency, and imaging follow up in 6 weeks is not appropriate management at presentation.
- Option D is not correct. The finding is abnormal so further management is required.

References:

SAM: 16 year old with amenorrhea. What question should the radiologist ask to confirm the diagnosis of PCOS?

- A. What are the ovarian volumes?
- B. How long has the patient had amenorrhea?
- C. Does the patient have acne or obesity?
- D. Is the patient sexually active so that a transvaginal US can be performed?
- E. All of the above.

References:
16 year old with amenorrhea. What question should the radiologist ask to confirm the diagnosis of PCOS?

• **Answer is E.**
• **Option A only is not correct.** While ovarian volume of >10.8 ml is one criteria in the diagnosis of PCOS in adolescents, many normal adolescents have large ovarian volumes. The presence of enlarged ovaries is not sufficient to confirm the diagnosis of PCOS. In addition, adolescents with PCOS may have ovarian volumes < 10 ml.
• **Option B only is not correct.** Oligo / anovulation may be physiologic. Thus, anovulation must be present for two years after menarche or primary amenorrhea present at age 15 to suggestive PCOS, with additional criteria required to confirm the diagnosis.
• **Option C only is not correct.** Clinical features including obesity, insulin resistance, and hyperandrogenism are associated with PCOS. However, hyperandrogenism can be present in normal adolescents (75%) with acne. Thus, acne only can be considered abnormal if it develops early, is inflammatory, persistent, severe and/or unresponsive to therapy. Biochemical hyperandrogenemia may be difficult to document. With obesity present in over 17% of normal adolescents this marker is weak for PCOS in the adolescent population as well.

References


6 year old with amenorrhea. What question should the radiologist ask to confirm the diagnosis of PCOS?

• **Option D is not correct.** While TVUS is useful in further assessment of follicular distribution and size, Polycystic Ovarian Morphology (PCOM) with cysts and echogenic stroma has a high prevalence in normal adolescents. Thus TVUS, while helpful in documenting cyst number, size and distribution, is not specific for the diagnosis of PCOS and may be contraindicated in young nonsexually active girls.
• **Option E is correct.** While the transabdominal ultrasound demonstrates bilaterally enlarged ovaries, all the above questions are important in helping further confirm the diagnosis of PCOS.

References


16 year old obese girl, anovulatory for 3 months. The ovarian volumes were over 22 mL bilaterally. Does the patient have PCOS?

A. No, as she has been amenorrheic for only 3 months
B. Yes, because ovarian volumes are > 10.8 mL
C. Yes, because the ovaries have > 12 small peripheral follicles
D. Yes, because the ovarian volumes are > 10.8 cm, multiple small peripheral follicles are present and the patient is obese
E. Maybe. Additional clinical features including documentation of hyperandrogenism are required before making the final diagnosis.

• **Answer is E.**
• **Option A is not correct.** Oligo / anovulation may be physiologic. Anovulation should be present for greater than 2 years since the start of menses or primary amenorrhea at age 15 to consider the diagnosis of PCOS. In this patient we do not know how long her menses have been irregular.
• **Option B is not correct.** Ovarian volumes can be > 10.8 ml in healthy young women or in adolescents with other ovarian pathology and thus cannot be the sole criteria in the diagnosis of PCOS. Adolescents with PCOS may have ovarian volumes < 10 mL.
• **Option C is not correct.** A Polycystic Ovarian Morphology (PCOM) prevalence of up to 30-40% has been describe in healthy girls and young women. Thus the presence of multiple peripheral cysts cannot be the sole criteria in the diagnosis of PCOM.
• **Option D is not correct.** With obesity present in over 17% of normal adolescents this marker is relatively weak for diagnosing PCOS in the adolescent population.
16 year old obese girl anovulatory for 3 months. The ovarian volumes were over 22 mL bilaterally. Does the patient have PCOS?

- **Option E is correct.** PCOS is a prevalent disorder that can go unrecognized in the adolescent because symptoms may be attributed to benign adolescent conditions or isolated obesity. However, over diagnosis can also be a problem as PCOM can be present in a normal healthy girl. Understanding the issues in accurate diagnosis allows for improvement in early diagnosis and effective interventions, reducing long term morbidity and mortality.

- While cut off points for identifying a pathologic degree of PCOM remain controversial, advanced imaging by US and/or MR should report ovarian volume, follicle size and number and can help confirm the diagnosis.

**References**


10 day old girl. Finding is bilateral. Diagnosis?

- **Option A is not correct.** The ultrasound shows the structure extending into the inguinal canal from the abdomen.
- **Option B is not correct.** Inguinal hernias commonly contain bowel but this structure does not have the appearance of bowel which typically has a multilayered appearance to the wall.
- **Option C is correct.** The herniated structure is ovoid with anechoic follicles representing an ovary. Bilateral inguinal ovaries suggest disorder of sexual development.
- **Option D is not correct.** The structure is not contiguous with the bladder and is not filled with anechoic fluid.
- **Option E is not correct.** The herniated structure does not resemble bowel.

**References**

Pre-menarchal female with intermittent RLQ pain. Which is false?

- A. There is uterine agenesis
- B. There is ovarian torsion
- C. Sacrum is normal
- D. Ovarian follicles are unremarkable

A premenarchal 14-year-old female presenting with intermittent right lower quadrant pain.

- Diagnosis: Uterine agenesis and incomplete right ovarian torsion with vascular twisting “whirlpool” sign on MRI.
- Explanation: Ovarian torsion is more common in cases of uterine agenesis due to poor fixation of the ovary. The ovaries are not tethered by the broad ligament, mesosalpinx, or the utero-ovarian ligament and only attached laterally to the pelvic sidewall by the infundibulopelvic ligament, which carries the ovarian vasculature and nerves.

References

SAM: Ultrasound in 12 year old girl with deepening voice and some facial hair, status post thyroidectomy 1 year earlier, shows a midline mass. The right ovary was not visualized. The left ovary is normal. Elevated alpha-fetoprotein. The lesion is most likely of which adnexal tumor class?

- A. Germ cell tumor
- B. Epithelial tumor
- C. Sex cord stromal tumor
- D. Hemangioma
- E. Metastatic disease

Ultrasound in a 12 year old girl with deepening voice and some facial hair, status post thyroidectomy 1 year earlier, shows a midline mass. The right ovary was not visualized. The left ovary is normal. Elevated alpha-fetoprotein. The lesion is most likely of which adnexal tumor class?

- Answer is C.
- The image shows a complex pelvic mass with cystic and solid components and with prominent vascular flow in the solid elements. The lesion was suspected to emanate from the right ovary as the ovary was not otherwise visualized.
- Option A is not correct. Malignant germ cell tumors may elaborate alpha-fetoprotein. Most commonly this marker is present with yolk sac tumors, immature teratomas, and mixed varieties. However, virilization is not a presentation feature.
- Option B is not correct. Epithelial tumors usually have a more dominant cystic component, do not elaborate alpha-fetoprotein, and do not cause virilization.
- Option C is correct. This lesion is hormonally active based on the patient's deepening voice and facial hair, making a sex cord stromal tumor the most likely diagnosis. Sex cord stromal tumors can elaborate various tumor markers although malignant germ cell tumors do so more frequently.
US image with power Doppler of the pelvis in a 12 year old girl with deepening voice and some facial hair, status post thyroidectomy 1 year earlier, shows a midline mass. The right ovary was not visualized. The left ovary is normal. Tumor marker labs were positive for elevated alpha-fetoprotein. The lesion is most likely of which adnexal tumor class?

• Option D is not correct. Ovarian hemangiomas do not cause virilization.
• Option E is not correct. Metastatic disease to the ovaries is rare in children. Most common neoplasms to spread to the ovaries are leukemia, lymphoma, neuroblastoma, and GI tumors. These lesions are usually solid, may be bilateral, and occur in the setting of widespread abdominal involvement. They are not characterized by virilization of the patient.

References: