1. **The most specific sonographic sign of testicular torsion is:**
   a. An enlarged testicle
   b. Hypoechogenicity of the testicle
   c. A twist in the spermatic cord
   d. A normal epididymis

**Correct Answer: C**

**Discussion:**
Sonography plays a key role in differentiating torsion from other causes of acute scrotal pain, especially epididymo-orchitis. Testicular torsion occurs when the testicle is abnormally fixed to the tunica vaginalis allowing rotation of the testicle within the scrotum and twisting of the spermatic cord. Testicular ischemia often results due to compromise of venous and arterial flow. Identification of the twist of the spermatic cord is an important and specific diagnostic finding in cases of torsion and is helpful in cases of partial torsion which may have preserved flow to the affected testicle. (therefore choice C is correct). The testicle may be enlarged and/or hypoechogenic in a wide variety of pathologies including inflammatory disease and malignancy. (therefore choices A and B are incorrect). Within the first 4 to 6 hours of torsion, the gray scale appearance of the testicle and epididymis may be entirely normal and the absence or marked diminution of flow on color Doppler exam to the symptomatic side may be the only finding. However, the epididymis is also normal appearing in other scrotal conditions such as torsion of the testicular appendages. (therefore choice D is incorrect). Since the blood supply to the epididymis is also compromised the epididymis may become enlarged and hypoechogenic, but importantly with absent or diminished flow, a differentiating feature from acute epididymitis. When arterial flow is present in a torsed testicle it typically demonstrates a high resistance pattern with absent or reversed diastolic flow. (therefore choice E is incorrect).

**References:**

**Modality:** C08.B  
**Primary Content:** C08.C  
**Anatomy:** C08.I  
**Pathology:** C08.E

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2. **Which of the following statements concerning testicular calcifications is correct?**
   a. The most commonly encountered testicular calcifications are large and coarse.
   b. Most intratesticular calcifications are palpable.
   c. Classic microlithiasis is described as greater than 10 calcifications in one testicle
d. Asymptomatic and apparently healthy young patients with testicular microlithiasis should undergo testicular biopsy.

e. Limited microlithiasis is more common than classic

Correct answer: E

Discussion:
Large testicular calcifications are rare and raise concern for an underlying calcified neoplasm such as a “burnt out” seminoma or mixed germ cell tumor. (therefore choice A is incorrect). Testicular microlithiasis is a much more common condition and appear as bright 1 to 2mm foci either distributed throughout the testicular parenchyma or limited to only a part of the testicle. It is found in roughly 0.5 to 9% of men undergoing scrotal sonography and does not produce a palpable abnormality. (therefore choice B is incorrect). Classic testicular microlithiasis (CTM) is defined as at least one image that shows five or more microliths in either or both testes and limited microlithiasis (LTM) is defined as at least one microlith but not satisfying criteria for CTM. (therefore choice C is incorrect). Interest in testicular microlithiasis has increased over the past few years, owing to an observed association with testicular germ cell tumor (TGCT). This association has added to evidence that testicular microlithiasis is a feature of the testicular dysgenesis syndrome (TDS), which is postulated to underpin disorders of male reproduction such as subfertility, testicular atrophy, cryptorchidism, TGCT and other abnormalities of sexual development. LTM is more commonly noted than CTM on sonography, (therefore choice E is correct) but of patients who have TM and present with a co-existing tumor, the incidence of CMT versus LMT is not statically different. However, many authors believe that clustering of microcalcifications is a risk for TGCT. That is to say that a cluster of 5 microliths on one view is of more concerning than 10 microliths scattered throughout the testicle. A patient diagnosed with testicular microlithiasis without a visible tumor needs careful initial evaluation for any personal and family history of testicular dysgenesis syndrome (TDS), including symptoms of subfertility, cryptorchidism, testicular atrophy and/or history of a previous TGCT. Asymptomatic and apparently healthy young adolescent and adult patients with testicular microlithiasis but without features of TDS should be monitored with testicular self-examination, rather than biopsy or screening sonography, since self-exam as effective in detecting a lesion in this population at lower risk. (therefore choice D is incorrect). In patients with MT and clinical features of TDS, more aggressive management is advocated including testicular biopsy.

References:
3. Which of the following statements concerning cystic ovarian lesions is correct?

a. Most intra-ovarian cystic lesions in premenopausal women are malignant.
b. Imaging can reliably distinguish between benign and malignant cystic neoplasms.
c. Vascular internal solid components in a cystic lesion are concerning for a neoplasm.
d. Echogenic wall foci in a complex cystic lesion indicates a malignant neoplasm.
e. Small simple ovarian cysts under 10 mm are rare in post menopausal patients.

Correct answer: C

Discussion:
The imaging feature most suggestive of a cystic ovarian neoplasm is the identification of vascularized mural nodules and/or septations representing viable tumor elements, a characteristic histological feature of epithelial ovarian tumors. (therefore choice C is correct) A complex physiologic cyst, such as a corpus luteum or a hemorrhagic functional cyst, may have a vascular wall and avascular thrombus and debris, but should lack internal vascular soft tissue. Most cystic lesions that are noted in women of reproductive age are physiologic ovarian cysts. Most tumors identified in this age group are benign, with the risk of malignancy increased in post menopausal patients. (therefore choice A is incorrect) Imaging can not reliably distinguish benign from malignant cystic ovarian neoplasms, particularly lesions of low malignant potential, also called borderline ovarian neoplasms. (therefore choice B is incorrect) Echogenic foci have been noted in the wall of endometriomas and likely occur due to cholesterol deposition from the breakdown of blood products. (therefore choice d is incorrect) Simple ovarian cysts under 10 mm can be seen in up to one third of postmenopausal patients undergoing high resolution imaging such as endovaginal ultrasound. (therefore choice E is incorrect)

References:

Modality: C08.B
Primary Content: C08.C
Anatomy: C08.J
Pathology: C08.C

4. The Society of Radiologists in Ultrasound Consensus Statement (SRUCS) guidelines for asymptomatic ovarian and other adnexal cysts in non-pregnant women recommends sonographic follow up at 6 weeks for which of the following lesions noted by Sonography:

a. Simple appearing ovarian cyst between 1 and 7 cm in a postmenopausal patient
b. Simple appearing ovarian cyst between 1 and 5 cm in a premenopausal patient
c. Simple appearing ovarian cyst over 7 cm in a premenopausal patient
d. Hemorrhagic cyst (defined as reticular pattern of echoes, no internal flow) under 5cm in a premenopausal patient
e. Endometrioma (Defined as homogeneous low level echoes, no solid component) regardless of size
Correct Answer: E. Endometrioma (Defined as homogeneous low level echoes, no solid component) regardless of size

Discussion:
Simple ovarian cysts (those that are round or oval, entirely anechoic with smooth walls, no solid elements or septations, posterior acoustic enhancement and no flow on color Doppler exam) are highly likely to be benign in women of all ages. Previous literature has noted that the few malignancies that have occurred in cysts thought to be malignant were all larger than 7.5 cm and small mural nodules were not noted by sonography because evaluation of the entire cyst wall is more technically challenging in lesions of this large size.

For premenopausal patients, the SRUCS recommends the following: ovarian cysts under 3 cm in premenopausal women are considered physiologic and do not need follow up and may not need to be reported. Simple ovarian cysts between 3 and 5 cm, require no follow up but the lesion should be reported. Between 5 to 7 cm, they are described as almost certainly benign and yearly follow up is recommended. (therefore choice A is incorrect) For postmenopausal women, the SRUCS recommends the following: simple cyst under 1 cm are considered clinically inconsequential and may not need to be reported and do not require follow up. Simple cysts between 1 and 7 cm are described as almost certainly benign and yearly follow up is recommended. (therefore choice B is incorrect) For lesions over 7 cm at any age, further imaging with MRI or surgical removal is recommended. (therefore choice C is incorrect) The SRUCS do not recommend follow up imaging for premenopausal patients with lesions that had a characteristics benign appearance such as a corpus luteum under 3 cm and a hemorrhagic cyst (reticular pattern of echoes without internal flow) under 5 cm. (therefore choice D is incorrect) A six to twelve week follow up sonographic exam was recommended lesions that were thought to be an endometrioma based on the findings of homogeneous low level echoes, lack of a solid component and possibly with echogenic wall foci as well as hemorrhagic cyst over 5 cm. (therefore choice E is correct)

References:

Modality: C08.B
Primary Content: C08.C
Anatomy: C08.J
Pathology: C08.C

5. Which of the following statements concerning hemorrhagic ovarian cysts is true?
   a. They typically have thick septations
   b. No follow up imaging is needed in pre-menopausal women when typical in appearance and under 5cm
   c. Failure to completely disappear on follow up sonography performed at 8 weeks is concerning for malignancy
   d. They most commonly occur in the first few days of the menstrual cycle
   e. The internal hemorrhagic component typically appears as low level internal echoes or a “ground glass appearance”

Correct Answer: B
Discussion:
The characteristic appearance of a hemorrhagic ovarian cyst (HOC) is a predominantly cystic lesion that has smooth walls containing blood products which have a variety of appearances depending on the stage of clot resorption at the time the patient is imaged. Retracting clot within a HOC appears as non-vascular soft tissue with a sharp, concave interface. The echogenicity of the retracting clot is typically less than that of the cyst wall. Fibrous strands within HOCs appear as fine, network of linear echoes that are weakly reflective of sound, an appearance termed a fishnet or basket weave appearance, and are typically greater than 20 in number. These thin fibrous strands are quite different in appearance to thick septations seen in ovarian neoplasms which are highly reflective of sound and few in number. (Therefore choice A is incorrect). If these typical findings are noted in women of menstruating age and the lesion is under 5 cm, sonographic follow-up is not routinely recommended by the current SRU guidelines. (Therefore choice B is correct). If follow-up is obtained, interval decrease in the size of lesion is highly likely to indicate a HOC. If the lesions persist, it is more likely to represent an endometrioma than a cystic neoplasm. (Therefore choice C is incorrect). The characteristic appearance of an endometrioma is that of a cystic lesion with low level internal echoes due on the presence of chronic blood products. (Therefore choice E is incorrect). However, an endometrioma imaged after a recent episode of hemorrhage may have fibrous strands and/or retractile clot and can overlap with the sonographic appearance of a HOC. HOC occur as an aberration of ovulation and therefore are most common around the time of ovulation. (Therefore choice D is incorrect)

References:

Modality: C08.B
Primary Content: C08.C
Anatomy: C08.J
Pathology: C08.M