AMSER Rad Path Case of the Month:

Sertoli Cell Tumor

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Patient Presentation

- HPI:
  - 36-year-old male presents with enlarging firm left testicular mass. Patient reports a similar mass 20 years ago that was biopsied and shown to be a benign cystic mass. However, since then, the patient has experienced an enlarging mass located in a similar placement as his prior mass.
  - He reports no fevers, chills, weight loss, nausea or vomiting. He does report weak urinary stream intermittently and occasional pelvic discomfort.
- Physical exam:
  - Approximately 2 cm palpable mass in posterior upper portion of left testicle. Mass is firm and tender to palpation. No lymphadenopathy present.
- PMHx:
  - prior left testicular biopsy for cystic mass

Pertinent Labs

- Tumor markers:
  - Alpha-fetoprotein - 1.9 (n: <15 ng/mL)
  - Lactate dehydrogenase - 196 (n: 110-216 U/L)
  - Beta-human chorionic gonadotropin - <1 (n: <3 mIU/mL)
- Hormone levels:
  - Luteinizing hormone - 4.4 (n: 2.0-9.0 mIU/mL)
  - Testosterone - 356 (n: 300-950 ng/dL)
  - Prolactin -7.8 (n: 4.0-15.2 ng/mL)
- CBC within normal limits

What Imaging Should We Order?

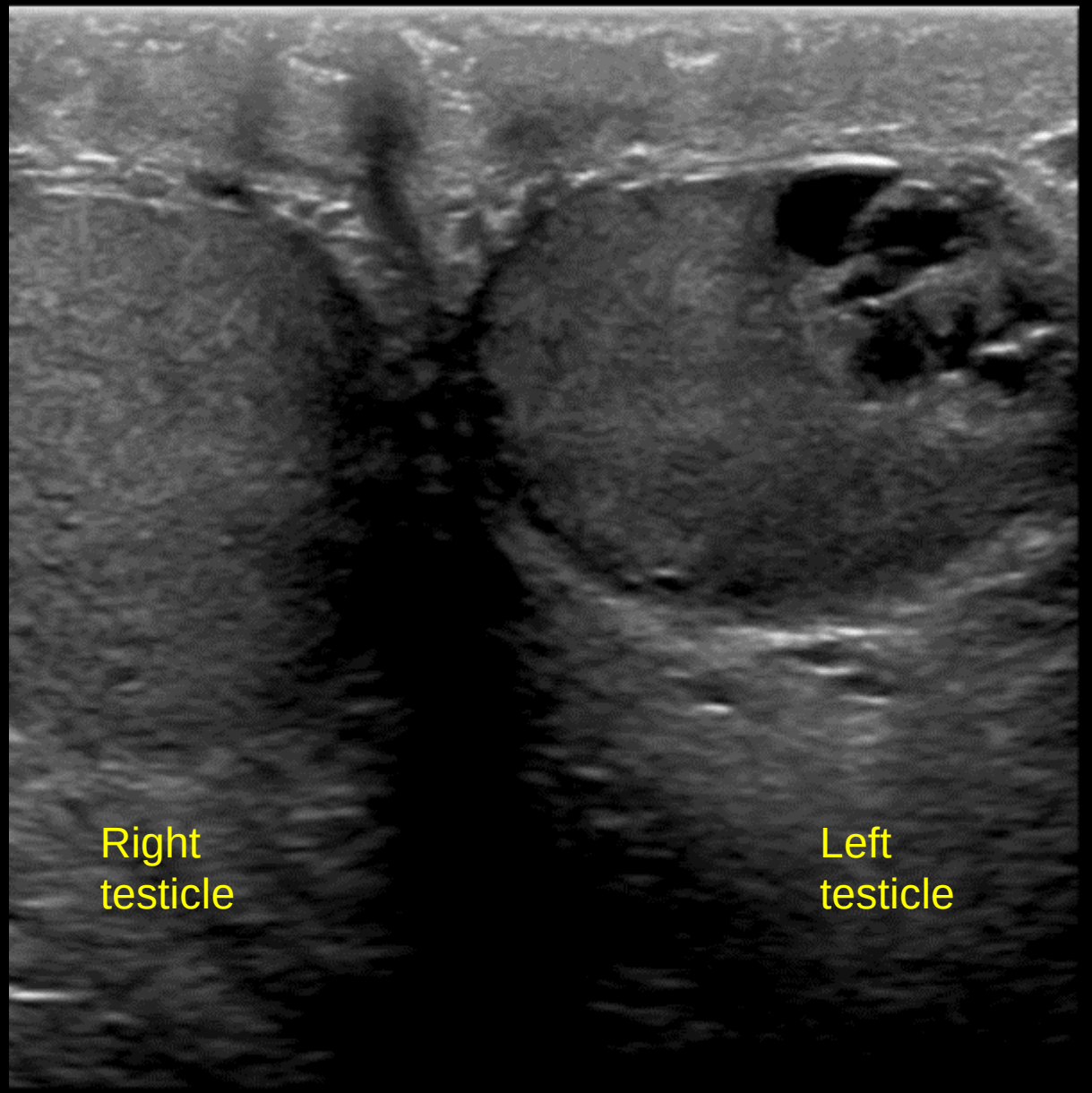
ACR Appropriateness Criteria

Variant 1: **Adult or child. Acute onset of scrotal pain. Without trauma, without antecedent mass. Initial imaging.**

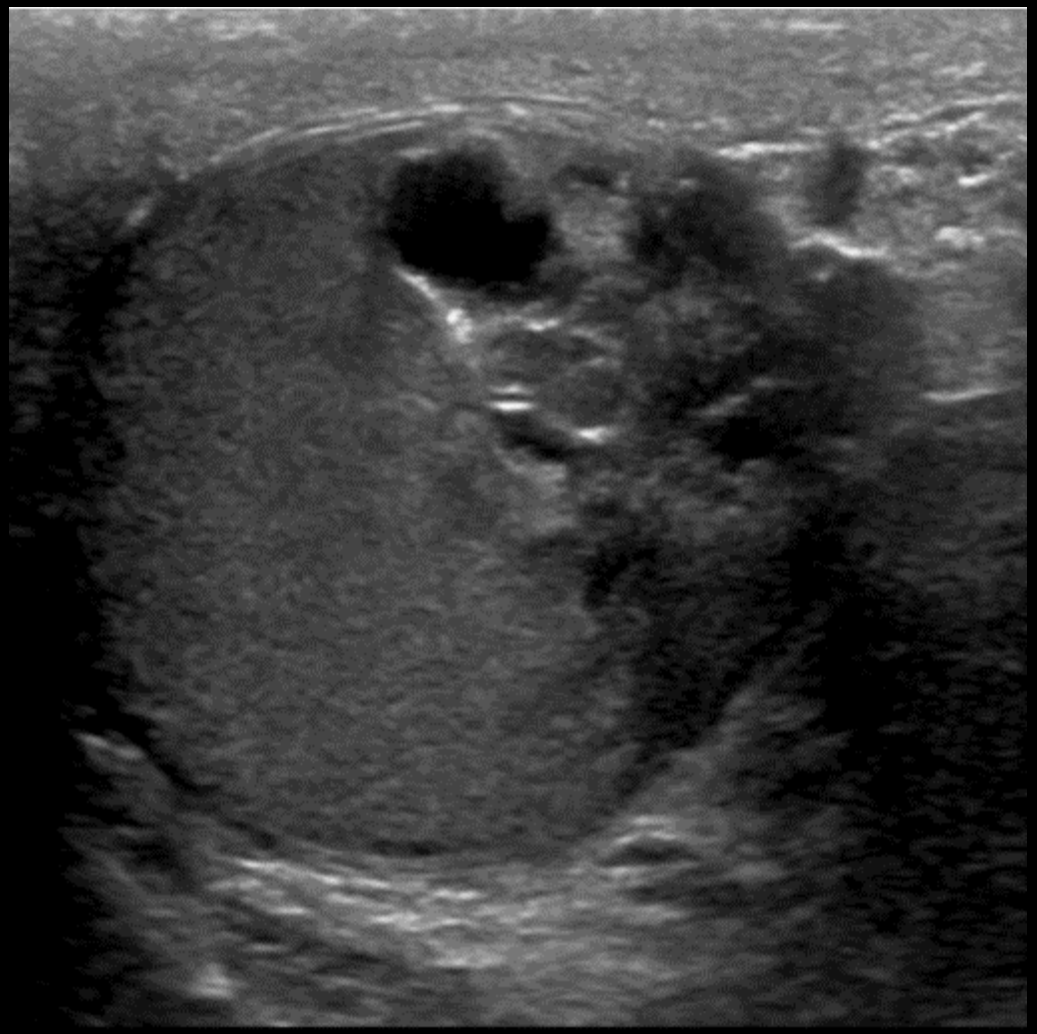
Procedure	Appropriateness Category	Relative Radiation Level
US duplex Doppler scrotum	Usually Appropriate	O
MRI pelvis (scrotum) without and with IV contrast	May Be Appropriate	O
Nuclear medicine scan scrotum	Usually Not Appropriate	☢☢☢
MRI pelvis (scrotum) without IV contrast	Usually Not Appropriate	O

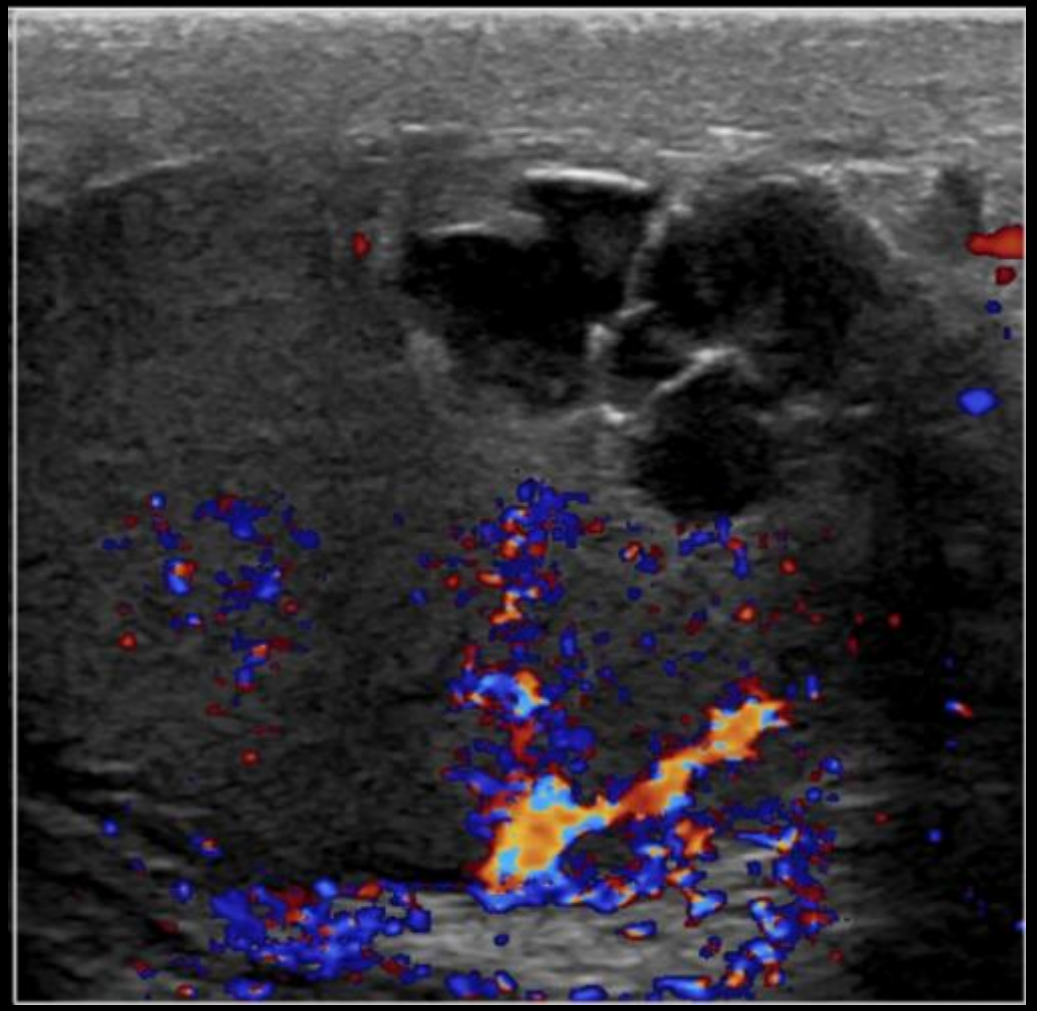
This imaging modality was ordered.

Ultrasound of testicles

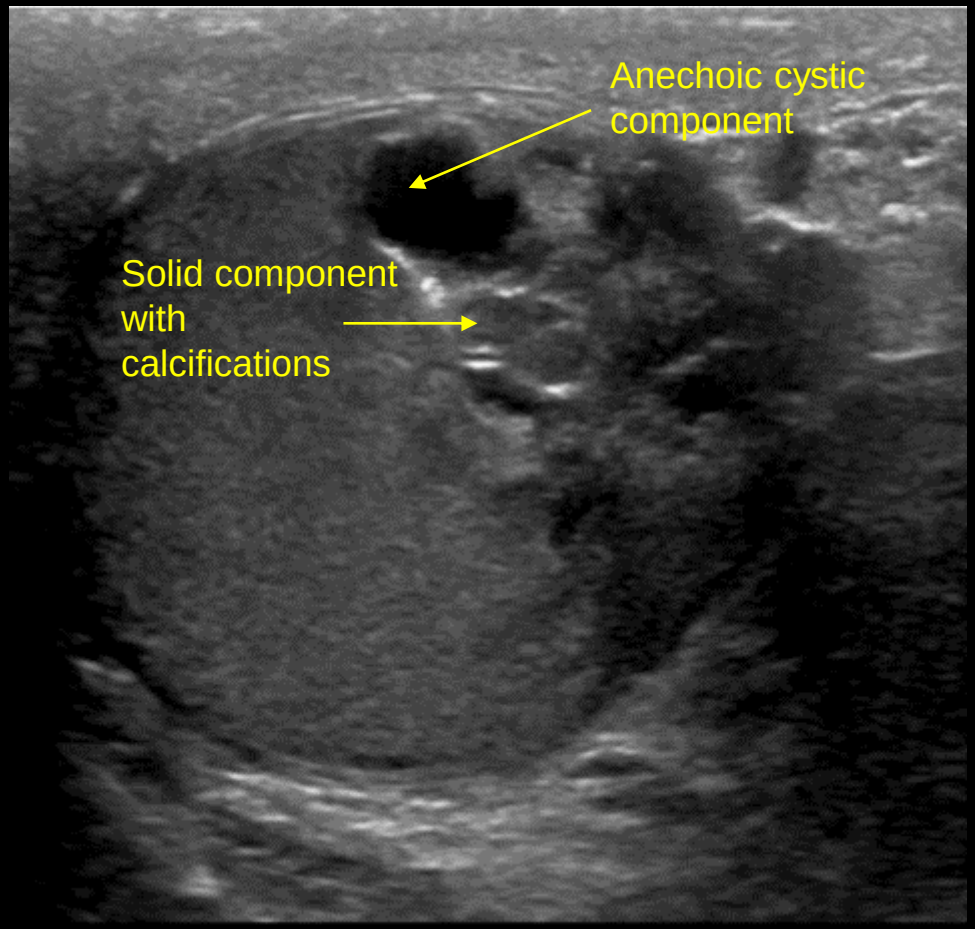


Left Testicular Ultrasound with Color Doppler

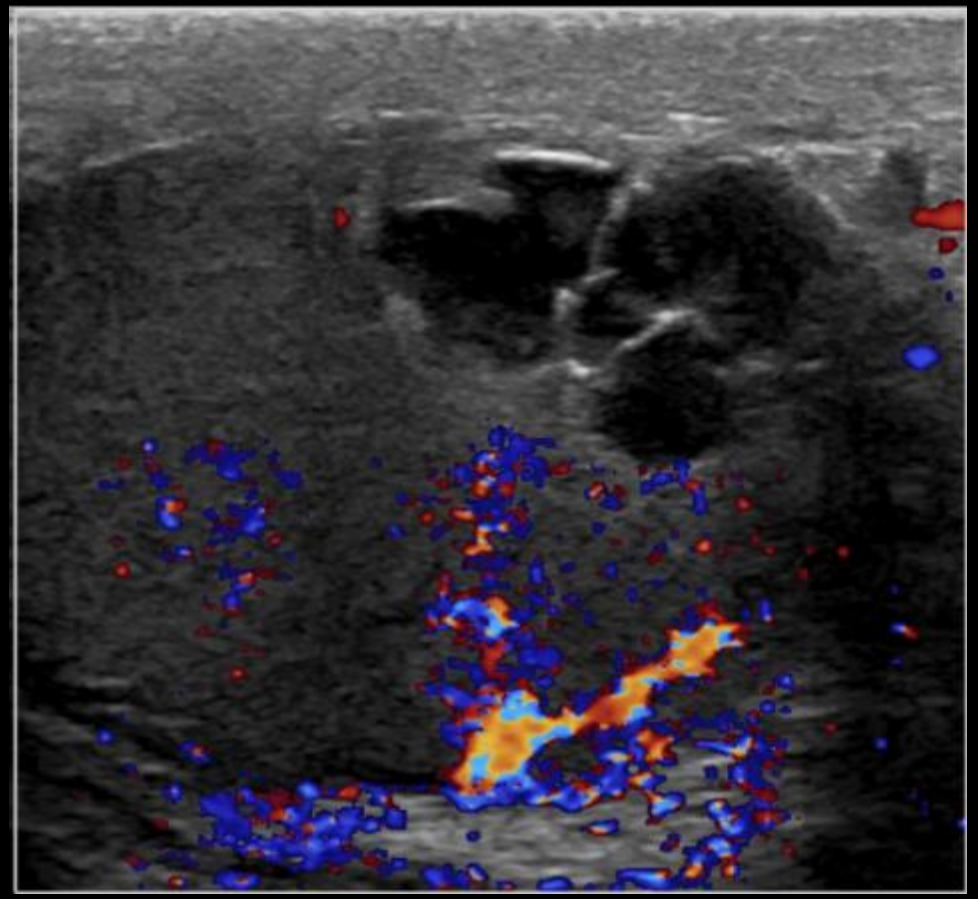




Left Testicular Ultrasound with Color Doppler



Left testicle with intratesticular mass that has cystic and solid components, measuring approximately 2.1 x 1.5 x 2.3 cm. These features are concerning for intratesticular neoplasm.

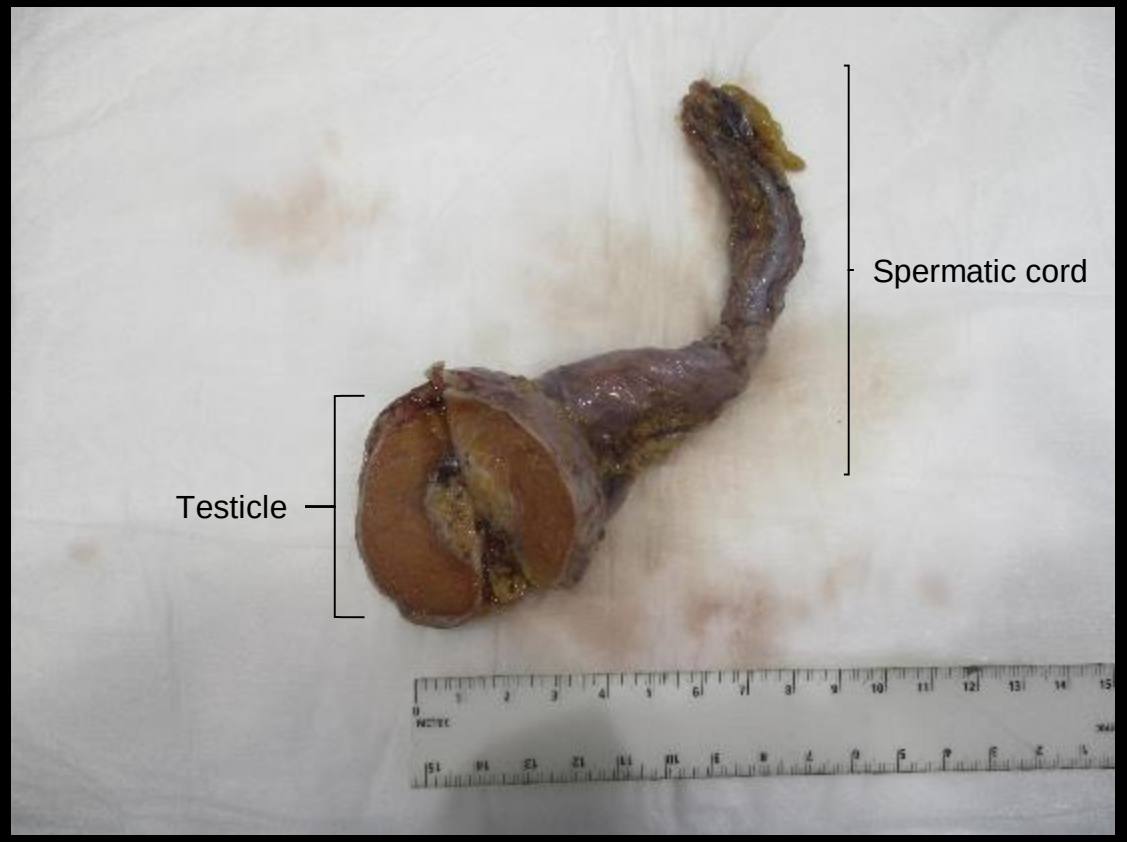


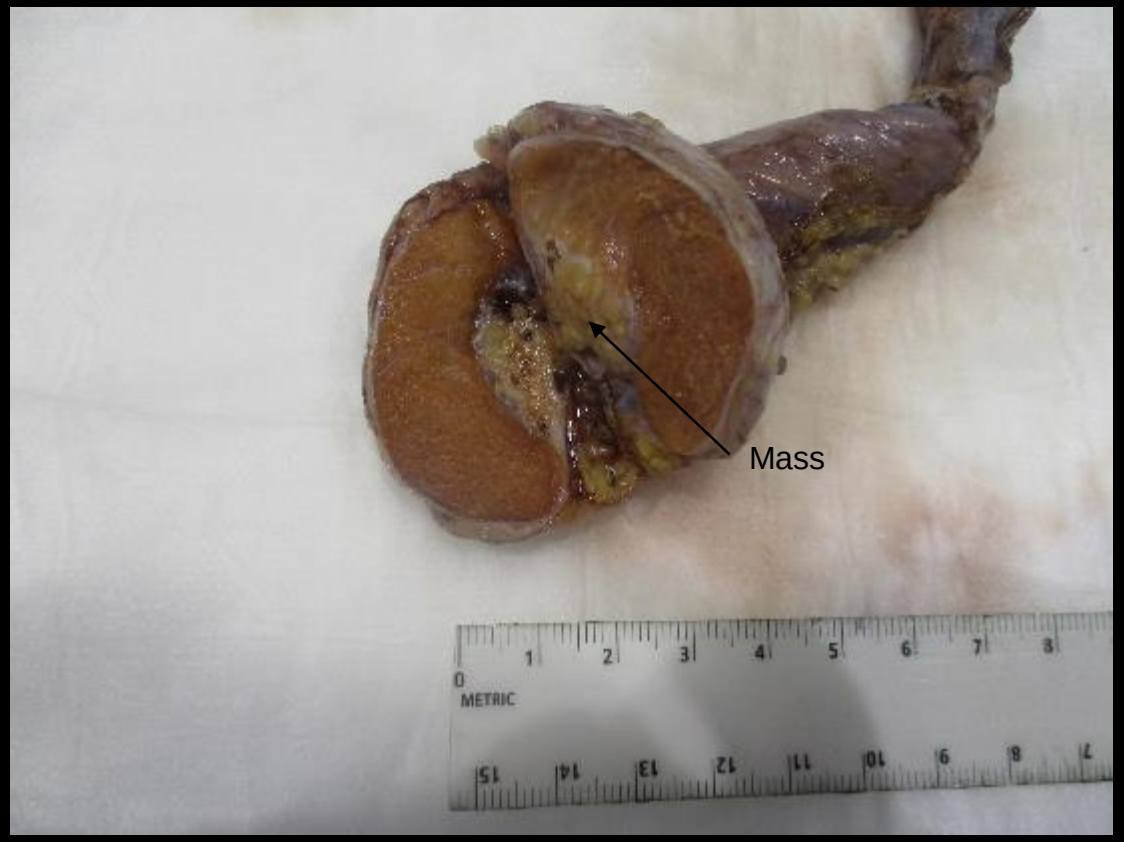
Color doppler evaluation of the testicle shows normal arterial inflow and normal venous outflow. No significant doppler flow identified in the mass.

Differential Diagnosis

- Testicular tumor
  - Germ cell tumor
  - Sex cord stromal tumor
  - Mixed
- Epidermoid cyst
- Cystic transformation of rete testis (intratesticular tubular ectasia)
- Cystadenoma of the rete testis

Pathology: Gross images





Left testicle and spermatic cord specimen from radical orchiectomy. The mass is well-circumscribed, yellow, lobulated, and located centrally

Histology

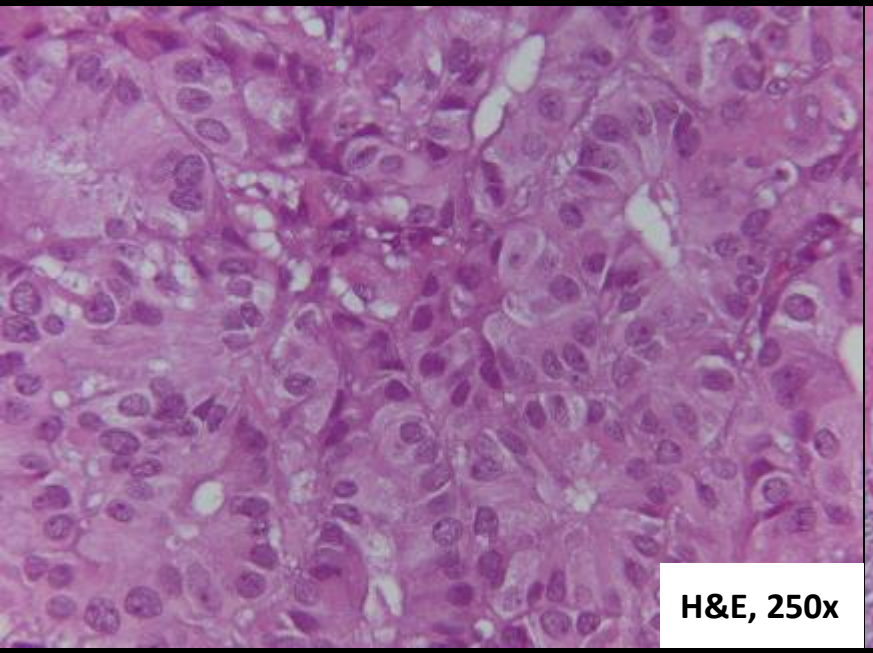


Image A
Seminiferous tubules lined by cells with pale, eosinophilic, elongated cytoplasm and round to oval nuclei with fine granular chromatin. Distinct nucleoli are seen forming nests, cords and tubules. No significant nuclear pleomorphism, mitotic activity or necrosis.

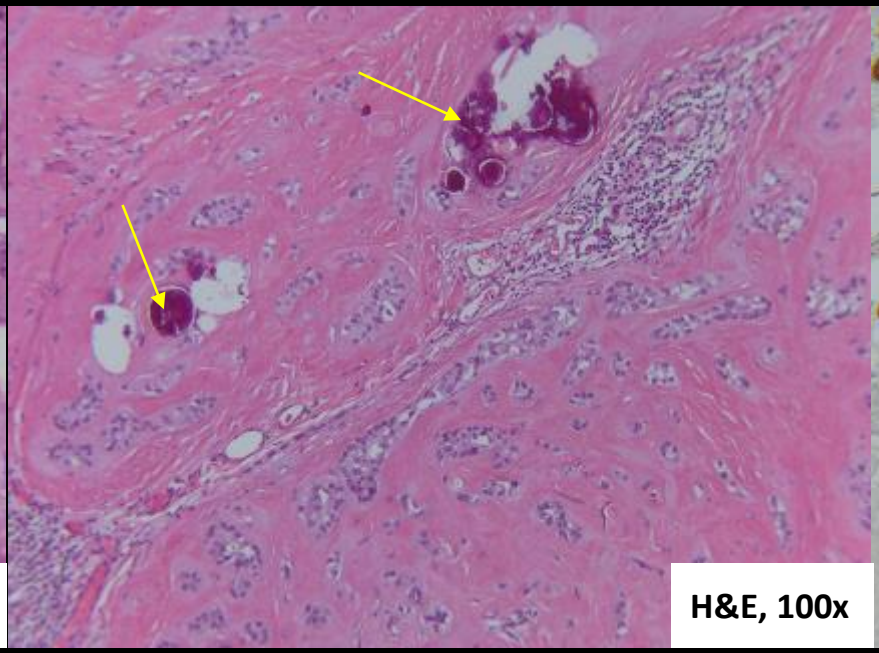


Image B
Focal areas of sclerosis and calcification.

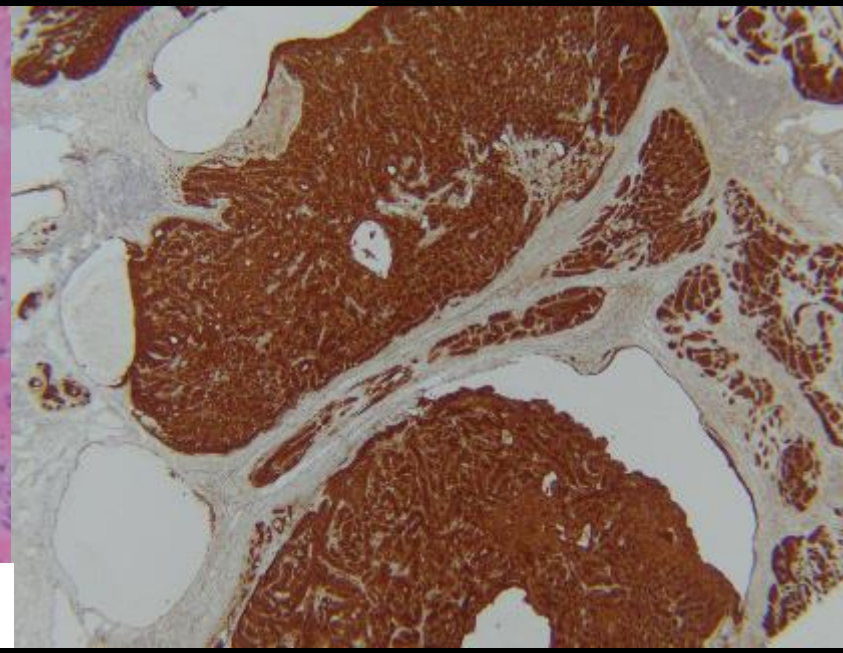


Image C
Inhibin immunohistochemistry stain.

The mass is (+) cytokeratin, (+) melan-A, (+) beta catenin, and (+) inhibin on immunohistochemistry stain.

Final Dx:

Sertoli Cell Tumor

Case Discussion

Sertoli cell tumor:

- Sertoli cell tumor is a type of sex cord stromal cell tumor (SCST) seen in the testicle. SCST involve the supporting tissues of the testi (ex. Sertoli cells and Leydig cells). Typically, testicular masses are 95% germ cell tumors and only 5% sex cord stromal tumors. SCST include Leydig cell tumors, Sertoli cell tumors, and granulosa cell tumors.

Epidemiology:

- Occurs in males around the mean age of 45 years old. Patients with large cell calcifying variant tend to be younger, around 21 years of age.
- Sertoli cell tumor is the second most common sex cord stromal cell tumor, behind Leydig cell tumors. Overall, it is 1% of all testicular tumors.

Presentation:

- Often presents as a unilateral painless testicular mass with or without discomfort, swelling, or scrotal heaviness. Typically, no endocrine changes (such as virilization) are associated.

Review of seminiferous tubule Histology

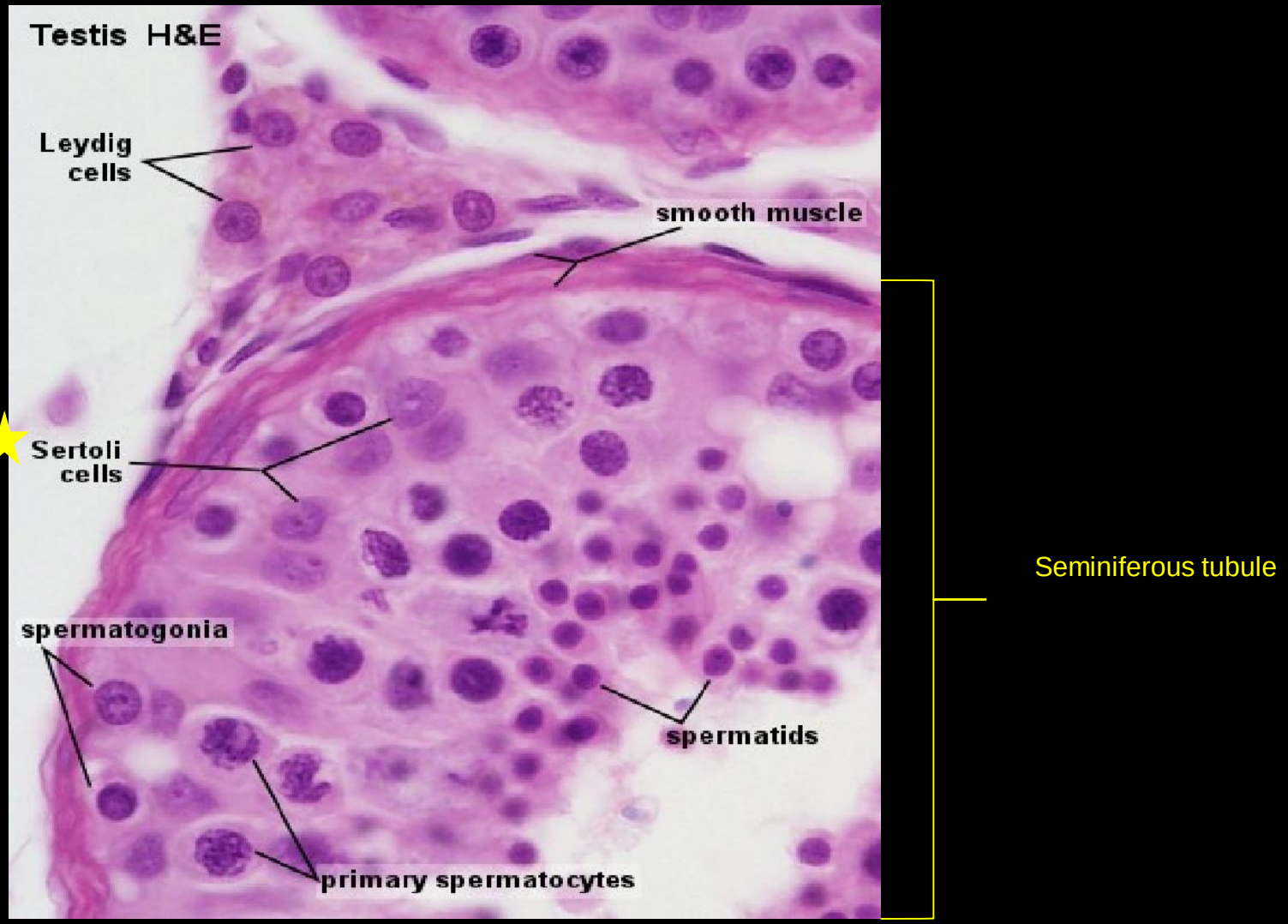


Figure 1

Case Discussion

Risks Factors:

- Cryptorchidism is a known risk factor in germ cell tumors. However, it is not associated with SCST. Rarely Sertoli cell tumors share some genetic associations with the inherited disorders Peutz-Jeghers syndrome and Carney syndrome. Overall, there are no specific risk factors associated with Sertoli cell tumors.

Pathology:

- Sertoli cells are found in seminiferous tubules and support spermatogenesis by enabling germ cell progression to spermatozoa. Seminiferous tubules are involved in the formation of male gametes through meiosis.

Categories of Sertoli cell tumors:

- "Not otherwise specified " type - no syndrome associations. The majority of Sertoli cell tumor types. Histologically features tubular differentiation with various morphology, including sclerosing and lipid rich. Beta - catenin mutation and Beta catenin (+) on immunohistochemistry stain. This type is the patient's final pathology diagnosis.
- Large –cell calcifying type - associated with Carney complex (cardiac myxomas, skin pigmentation, endocrine hyperactivity with PRKAR1 A gene mutation) . Histologically appears as large cells with abundant eosinophilic cytoplasm and calcifications. S100 (+) and inhibin (+) on immunohistochemistry stain.
- Intratubular large cell hyalinizing type – associated with Peutz-Jeghers syndrome (gastrointestinal polyposis, muco-cutaneous pigmentation with STK11 gene mutation). Histologically appears as expanded seminiferous tubules with petal like features of large Sertoli cells with eosinophilic to vacuolated cytoplasm.

Case Discussion

Pathology:

- Sertoli cell tumors grossly appear as a unilateral well circumscribed , lobulated, yellow-tan mass.
- If malignant features are seen (necrosis, increased mitotic activity, nuclear atypia) metastatic disease spreads to retroperitoneal lymph nodes.

Imaging:

- Ultrasound is the best mode of visualization for a testicular mass. Sertoli cell tumors are characterized as ill-defined hypoechoic intratesticular lesions. Although usually solid, this lesion had cystic features. Large –cell calcifying Sertoli cell tumors can have large areas of calcification on ultrasound. Due to nonspecific features on ultrasound and concerns for malignancy, diagnosis is confirmed after orchiectomy. In this case, the patient had a benign Sertoli cell tumor “not otherwise specified” type.

Prognosis:

- Good prognosis. Vast majority are benign and about 5% are malignant.

Orchiectomy can be curative along with continued observation.

Case Discussion

Differential diagnosis:

- Often mistaken with Sertoli cell nodules (immature tubules composed of Sertoli cells only), seminomas (features clear cells, fibrous septa) , and Leydig cell tumors (features abundant eosinophilic cytoplasm). Endocrine factors such as virilization can differentiate Sertoli cell tumor from Leydig cell tumor. Virilization is more commonly seen in Leydig cell tumors , though it can be seen in 20-30% of Sertoli cell tumors. Unlike Leydig cell tumors, tumor marker elevation (AFP , LDH, B-hCG) is not seen in Sertoli cell tumors. The patient had negative tumor markers and negative hormonal abnormalities.

Treatment:

- Since Sertoli cell tumors tend to be benign, orchiectomy offers complete treatment without the need for chemotherapy or radiation.

References:

1. ACR Criteria of Appropriateness : Acute onset of scrotal pain –without trauma, without antecedent mass. https://acsearch.acr.org/docs/69363/Narrative/

2. Taplin M. Testicular sex cord stromal tumors. In : UpToDate, Post, TW (Ed), UpToDate, Waltham, MA 2020

3. Kapoor, M. (2021, July 1). *Sex cord stromal testicular tumor*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK558916/.

4. Mooney KL, Kao CS. A Contemporary Review of Common Adult Non-germ Cell Tumors of the Testis and Paratestis. Surg Pathol Clin 2018; 11: 739

5. Figure 1: https://www.researchgate.net/figure/A-cross-section-of-the-testis-showing-Sertoli-cells-and-Leydig-cells_fig4_302987409

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