

AMSER Case of the Month

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17-year-old male with right-sided scrotal pain

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Patient Presentation

HPI:

- 17-year-old male presented to emergency department with right-sided scrotal swelling and pain
- Symptoms began 6 weeks ago when he noticed a right testicular nodule with increased swelling and pain within last couple of days
- Denies any trauma, no dysuria, hematuria or urethral discharge.

Physical exam

- Vitals: Temperature 37, HR 98, BP 124/66, RR 22, oxygen 98% on room air
- Testicular exam revealed hard nodule on right inferior aspect of testicle, left testicle without tenderness or masses

Pertinent Labs

- LDH 499
- FAP 1.4
- hCG <10
- Urine analysis: unremarkable
- Urine culture: negative

What Imaging Should We Order?

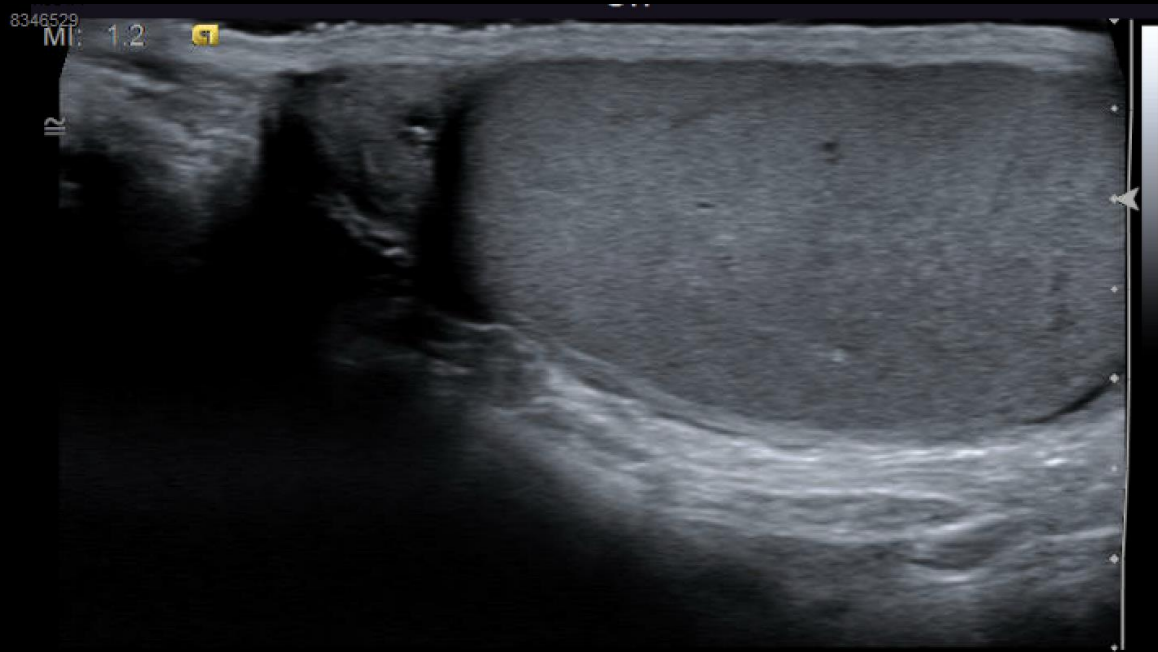
Select the applicable ACR Appropriateness Criteria

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Scrotal pain, acute, nontraumatic, no antecedent mass, initial imaging	3197600	● US duplex Doppler scrotum	0 mSv O	0 mSv [ped] O	Usually appropriate
		● US scrotum	0 mSv O	0 mSv [ped] O	Usually appropriate
		● MRI pelvis (scrotum) without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI pelvis (scrotum) without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● CT pelvis with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼	Usually not appropriate
		● CT pelvis without IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼	Usually not appropriate
		● Nuclear medicine scan scrotum	1-10 mSv ☼☼☼	0.3-3 mSv [ped] ☼☼☼	Usually not appropriate
		● CT pelvis without and with IV contrast	10-30 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼	Usually not appropriate

This imaging modality was ordered by the ER physician

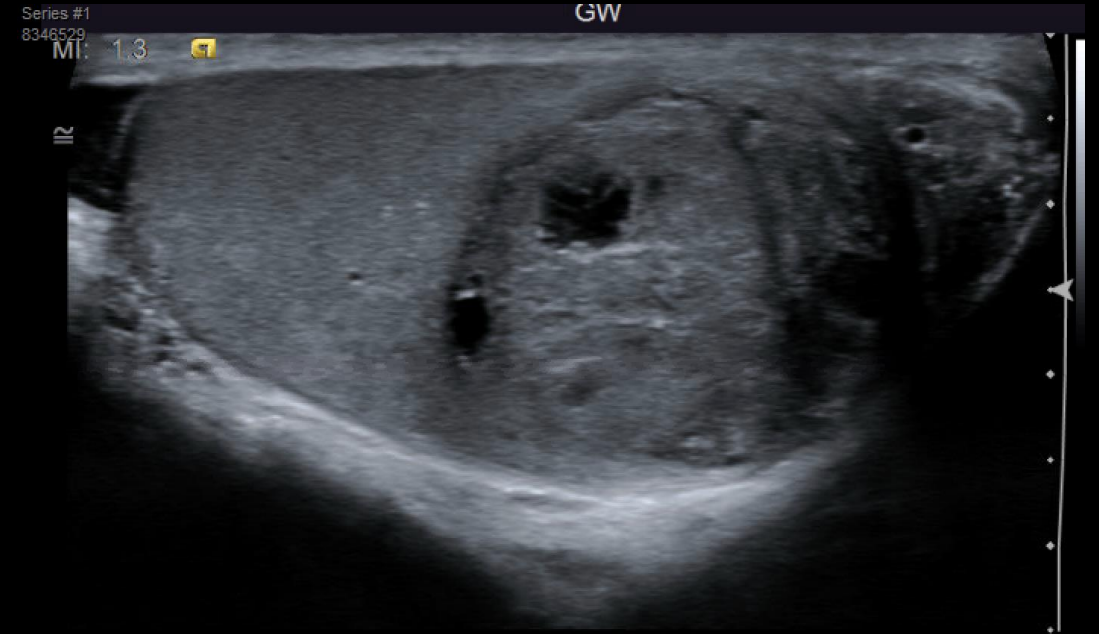


Findings (unlabeled)



LT SAG EPI

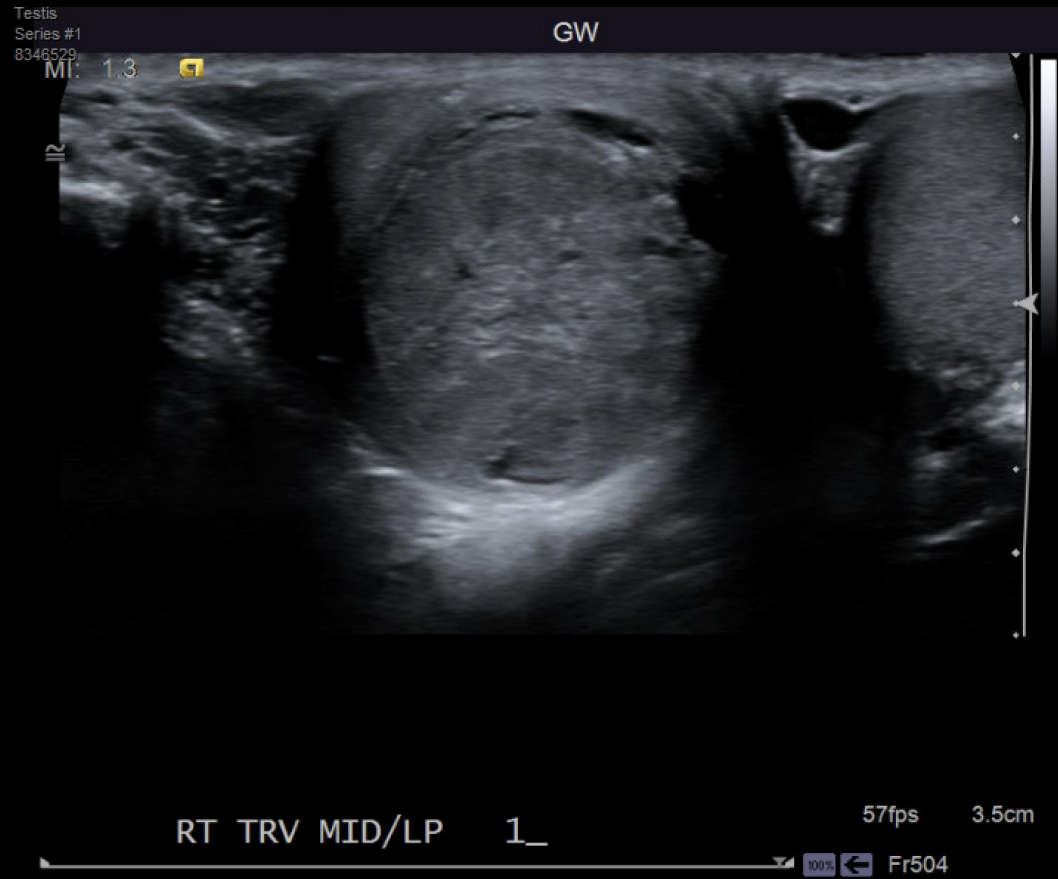
Left testicle, sagittal view



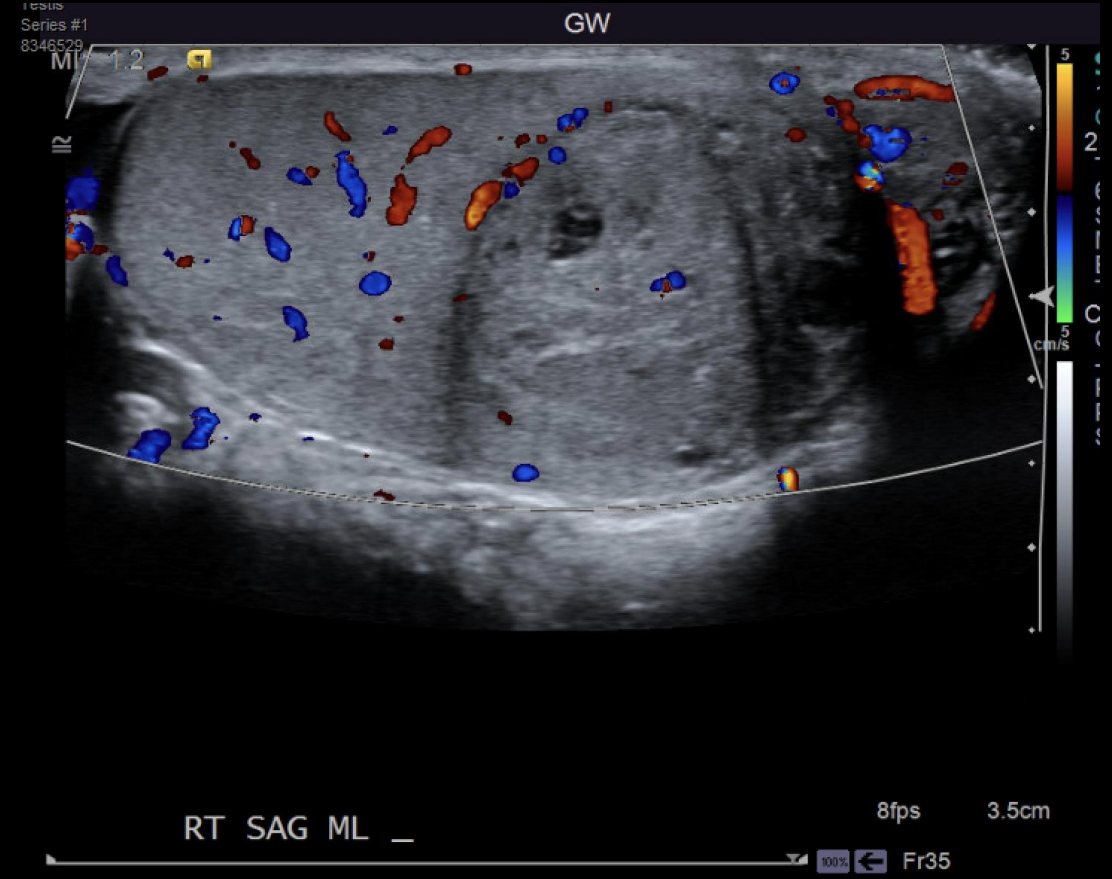
RT SAG 1

Right testicle, sagittal view

Findings (unlabeled)



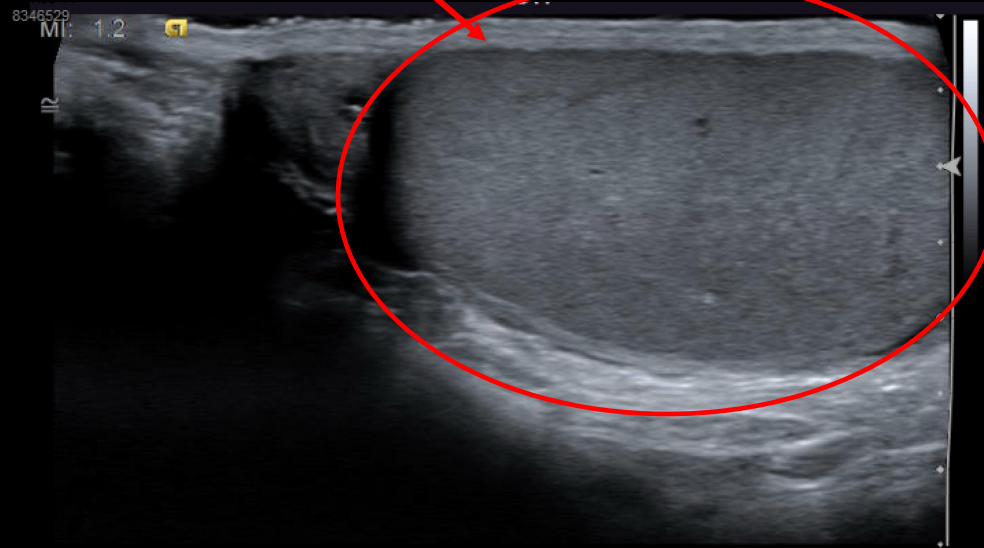
Right testicle, transverse view



Right testicle, sagittal view
with doppler

Normal, homogenous
left testicle

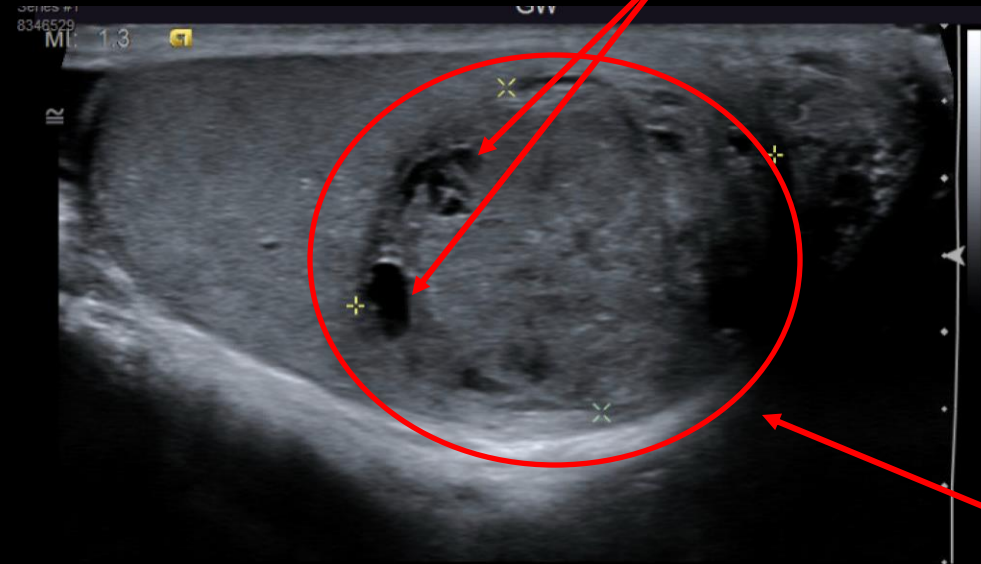
Findings: (labeled)



LT SAG EPII

57fps 3.5cm

Left testicle , sagittal view



RT SAG 1

57fps 3.5cm

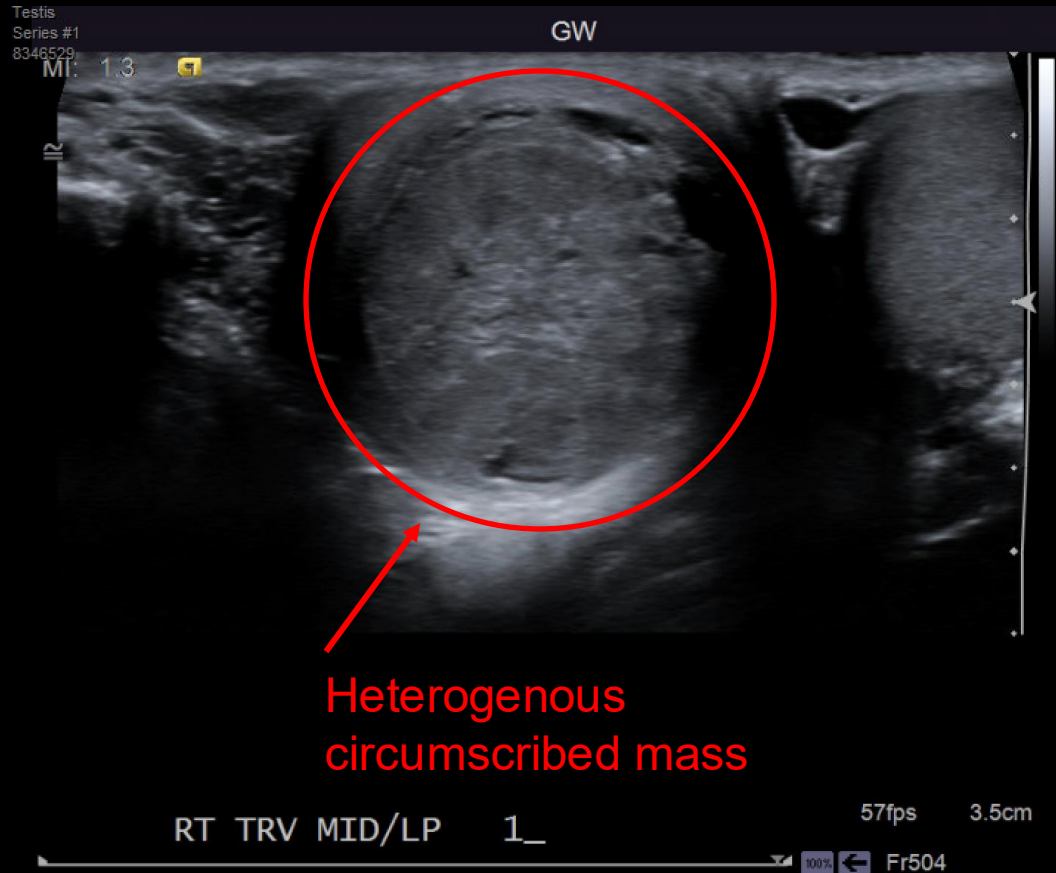
100% ← Fr505

Right testicle, sagittal view

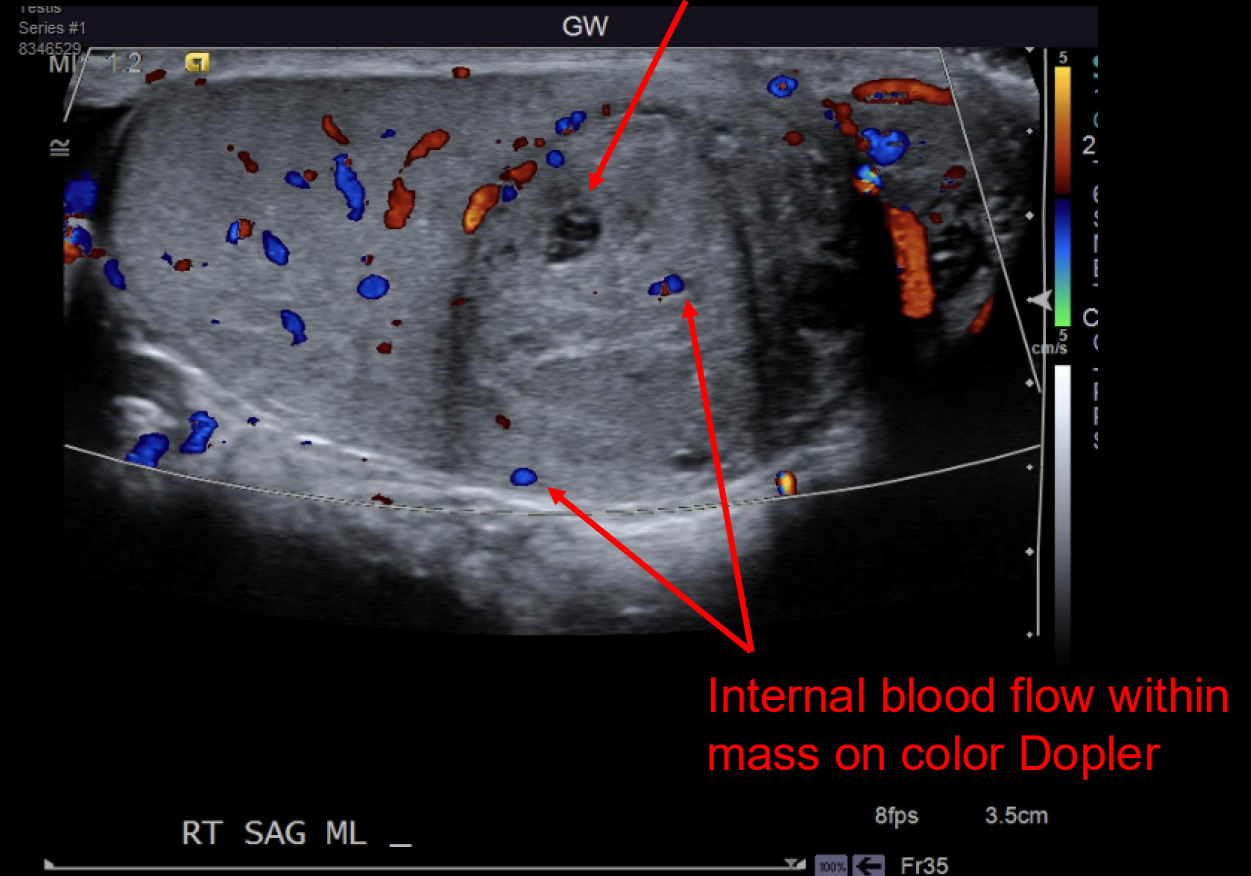
Cystic foci

Heterogenous
circumscribed
mass within
the lower pole
of the right
testicle
measuring 2.9
x 2.2 x 2.3 cm

Findings: (labeled)



Right testicle, transverse view



Right testicle, sagittal view
with doppler

Final Dx:

Mixed Germ Cell Tumor

Case Discussion

Epidemiology¹

- Testicular cancer is the most common solid malignancy in adolescent and young adult males ages 15 to 40
- In the United States, there are approximately 10,000 new cases per year with a mean age at diagnosis of 33; with only 6% of cases occurring in children or adolescents younger than 18

Risk factors²

- Cryptorchidism (undescended testis): 4- to 8-fold increased risk
- Personal history of contralateral testicular cancer
- Family history of testicular cancer
- Infertility/subfertility: Men with abnormal semen parameters
- Gonadal dysgenesis and disorders of sex development: hypospadias and other genital malformations
- Klinefelter syndrome and other genetic conditions
- Cannabis use
- Genetic predisposition

Case Discussion

- Types of testicular cancers have four major groups¹:
 - Germ cell tumors derived from Germ Cell Neoplasms In Situ (GCNIS) (~80–90%)
 - Germ cell tumors unrelated to GCNIS (~10%)
 - Sex cord-stromal tumors (~5%)
 - Tumors of the testicular adnexa
- Germ cell tumors derived from GCNIS include¹:
 - Seminomas - most common
 - Embryological carcinoma - highly aggressive and undifferentiated
 - Yolk sac tumor
 - Choriocarcinoma
 - Teratoma - contains ≥ 2 embryonic cell layers
 - Trophoblastic tumor
 - Mixed germ cell tumor - contain ≥ 2 histologic components

Case Discussion

Classic presentation²

- Most frequently presents as painless palpable mass, testicular swelling or asymptomatic incidental finding on ultrasound
- Dull scrotal pain may occur, and rarely acute testicular pain most likely caused by hemorrhage or tumor infarction
- Some patients may have hydroceles and gynecomastia upon presentation
- Metastatic disease can cause other symptoms depending on location and extension of tumor
- Constitutional symptoms may also be present

Evaluation of a scrotal mass³

- Painless scrotal mass
 - If transillumination present → likely hydrocele
 - If “bag of worm” on palpation → likely varicocele
 - If reducible mass → likely hernia
 - If extra-testicular → likely benign → consider ultrasound
 - If intratesticular → obtain ultrasound and consult urology

Case Discussion

- Typical mixed germ cell tumor appearance on ultrasound⁴:
 - Heterogenous, solid-cystic mass
 - Hypervascularity compared to surrounding parenchyma
 - Calcifications
 - Hemorrhage
- Evaluation of metastatic disease⁵
 - CT with contrast of abdomen and pelvis
 - Retroperitoneal lymph nodes are the most frequent site of initial metastatic spread¹
 - CT chest with IV contrast

References:

1. Singla N, Bagrodia A, Baraban E, Fankhauser CD, Ged YMA. Testicular Germ Cell Tumors: A Review. *JAMA*. 2025;333(9):793-803. doi:10.1001/jama.2024.27122
2. Chavarriaga J, Nappi L, Papachristofilou A, Conduit C, Hamilton RJ. Testicular cancer. *Lancet*. 2025;406(10498):76-90. doi:10.1016/S0140-6736(25)00455-6
3. Langan RC, Puente MEE. Scrotal Masses. *Am Fam Physician*. 2022;106(2):184-189.
4. Katabathina VS, Vargas-Zapata D, Monge RA, et al. Testicular germ cell tumors: classification, pathologic features, imaging findings, and management. *RadioGraphics*. 2021;41(6):1698-1716. doi:10.1148/rg.2021210024
5. Stephenson A, Eggener SE, Bass EB, et al. Diagnosis and Treatment of Early Stage Testicular Cancer: AUA Guideline. *J Urol*. 2019;202(2):272-281. doi:10.1097/JU.0000000000000318