

# Sacroccocygeal Teratomas



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# Sacrococcygeal Teratomas

- Tumor derived from germ cells ( 3 layers) that are foreign to the anatomic site in which they arise
- Typically midline or paraxial
- May be solid, cystic or mixed
- Mature vs Immature vs Malignant
  - neuroepithilium
- Most common neonatal tumor
  - 1:35,000 - 1:40,000
  - Females more commonly affected



# Types

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- Yolk Sac Tumors (67%)
  - Most commonly Sacrococcygeal > Ovary
    - Other: Mediastinum, Retroperitoneum, Vagina, Testicle, Intracranial
- Embryonal
- Choriocarcinoma
- Mixed (10% worse prognosis)



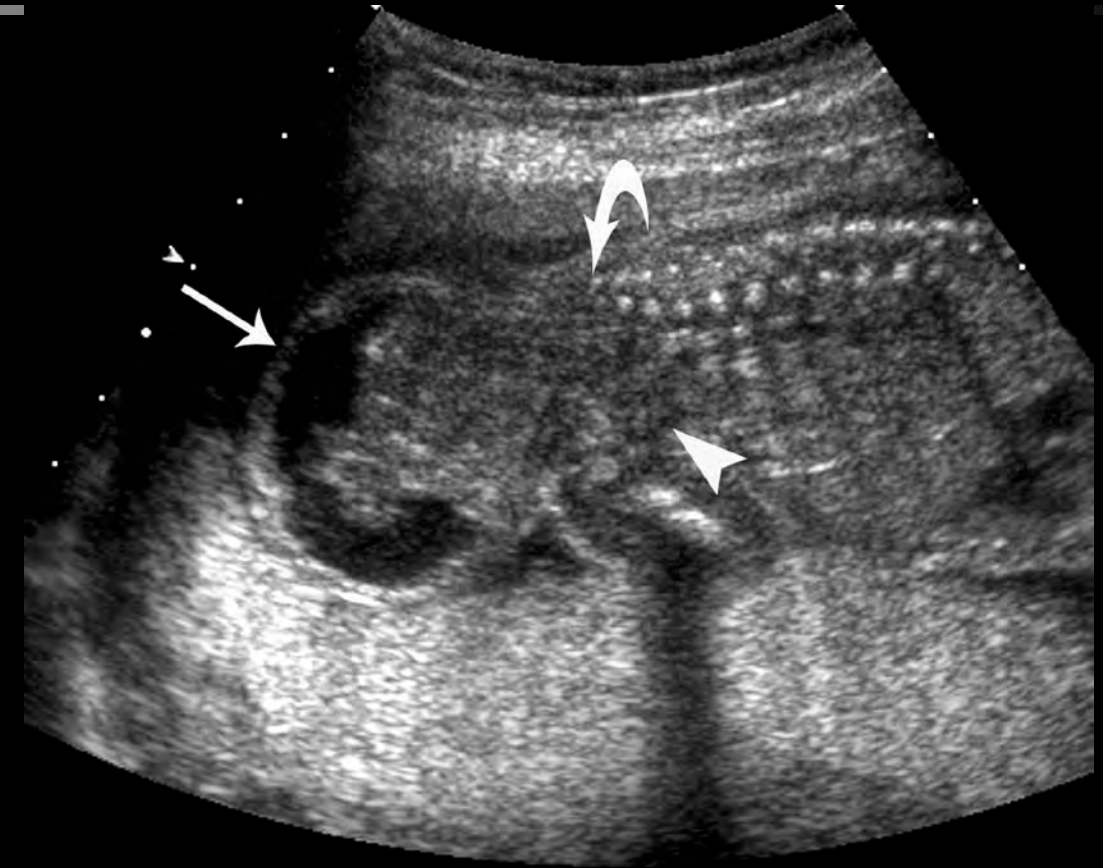
# Clinical Presentation

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- Present as a protruding mass arising from the coccyx
- Vascular Steal
- High Output Cardiac Failure (Hydrops)
- Tumor rupture/hemorrhage (> 5cm)
- Maternal Mirror Syndrome
- Lower Extremity Weakness
- Bladder, Rectal Obstruction

***Early delivery as an Alternative Management Strategy for Selected High Risk Fetal Sacrococcygeal Teratomas***

Risk  
Serial US  
Delivery



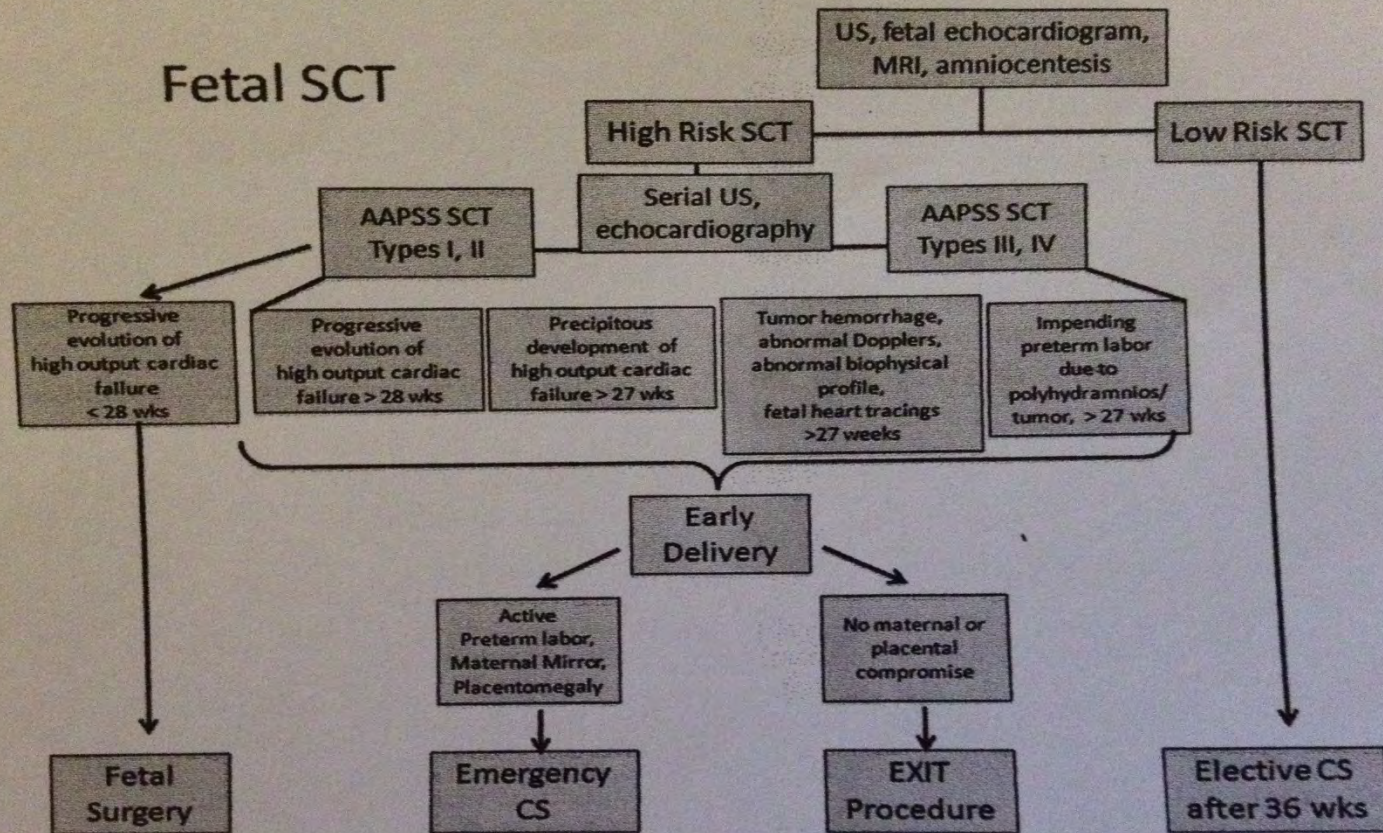


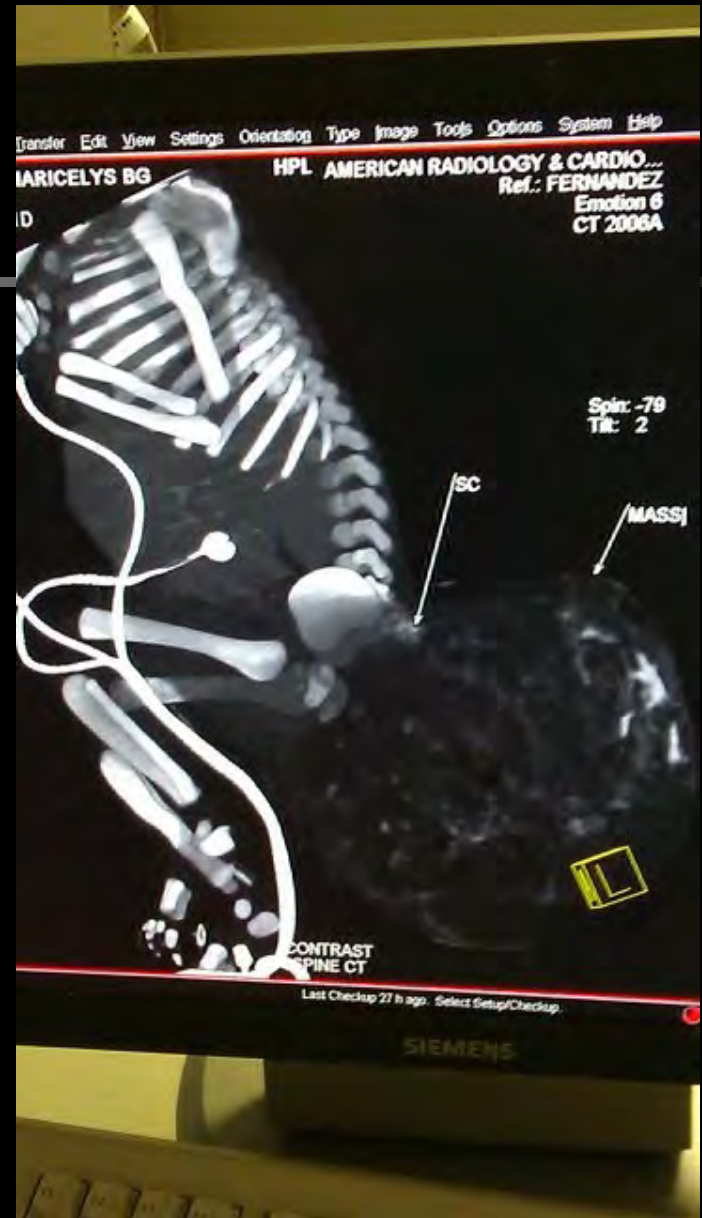
Fig. 3 Modified algorithm for prenatal management of SCT.

- 28-32 weeks maternal/fetal decompensation → Labor
- <27 weeks Type III/IV, maternal health overrides
- Ex Utero Intrapartum Treatment



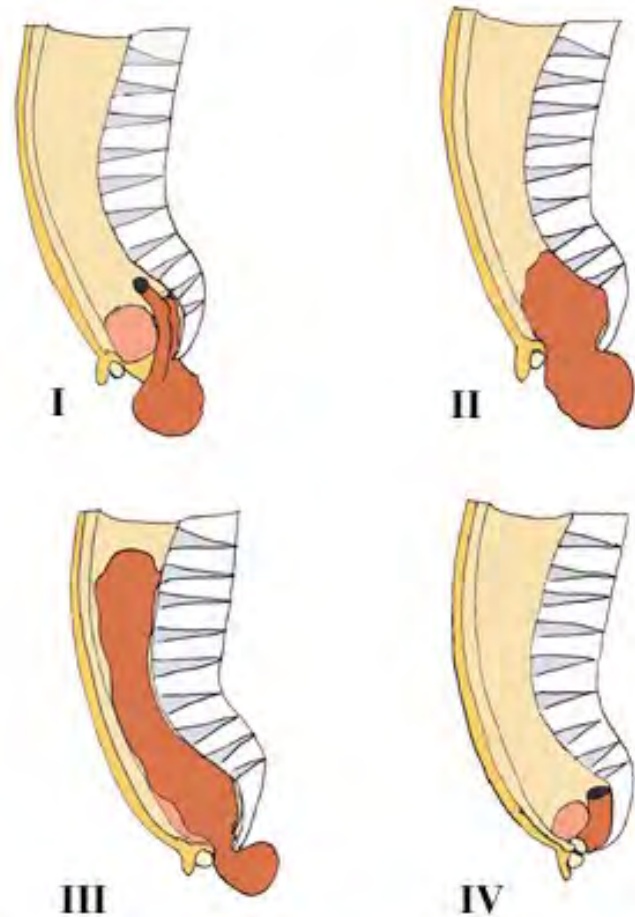
# Classification

- Type I tumors (47%, most common)
  - Completely external
  - Identifiable prenatally
  - Least morbid
  - Usually Benign



# Classification

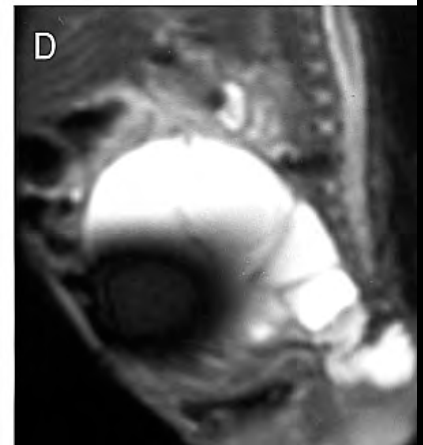
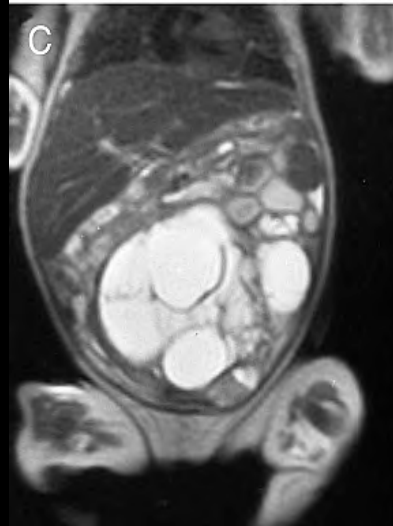
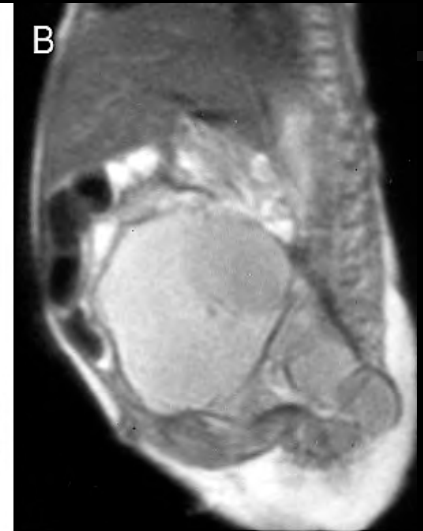
- Type II (35%)
  - Intrapelvic Component
- Type III (8%)
  - Intrabdominal Component





# Classification

- Type IV (9%)
  - Completely Internal
  - Recognized Late
  - Malignant Transformation
  - Poor prognosis





# Tumor Markers

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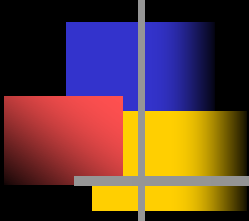
- Alpha Feto Protein, B-HCG
- Useful in monitoring treatment response and tumor recurrence
- Our Patient's: B-HCG <2, AFP 12,472 (7/11/2011)
  - 1360 Aug 2011, 372 Oct 2011
    - AFP return to adult levels by 8 mo

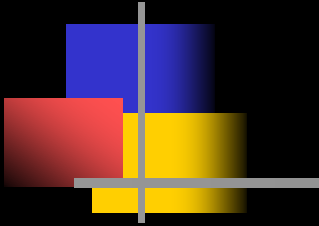


# Treatment

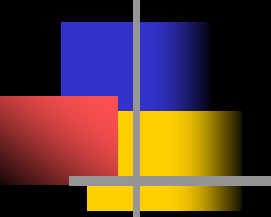
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- Posterior anorectal approach vs Combined abdominal approach
- Blood Supply: Midsacral Artery and Hypogastric Artery Branches
- Coccygectomy: recurrence >35%









DETECTO

1227

GROSS

TARE

NET

ZERO

NET

MEMORY

ON  
ZERO

OFF

CAPACITY 4000 g x 1 g



# Staging

Table 29-4 Staging for Extragonadal Tumors\*

STAGE	EXTENT OF DISEASE
I	Complete excision at any site, coccygectomy for sacrococcygeal site, negative tumor margins; tumor markers positive but fall to normal if negative at diagnosis; lymphadenectomy must be negative for tumor
II	Microscopic residual; lymph node negative; tumor markers positive or negative
III	Gross residual or biopsy only; retroperitoneal nodes negative or positive; tumor markers positive or negative
IV	Distant metastases, including liver

\*Children's Cancer Study Group and Pediatric Oncology Group.

- Platinum based Chemotherapy
  - Cisplatin, Carboplatin + Bleomycin, Etoposide
- Neoadjuvant if advanced
  - 83% 5 yrs neoadjuvant + Surgery vs 49% surgery alone
- Radiation for presence of metastasis

■ [www.uptodate.com](http://www.uptodate.com), *Pediatric Surgery, 5th Ed, O'Neill Jr, et al.*



# Prognosis

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- Benign: disease free survival > 90%
- Time is of the essence:
  - <2 months, 7-10% malignant
  - > 1 year, 75% malignant
- Follow up: 3-6months for 3 yrs
  - Most recurrences occur within 1st 3 yrs.



# Characteristics

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- Malignancy characteristics increases with:
  - Age at diagnosis
  - Surgical type (type IV is worst)
  - Male
  - Presence of necrosis and hemorrhage
  - Degree of immaturity doesn't correlate with malignancy except in ovary



# References

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- *Pediatric Surgery, 5th Ed, O'Neill Jr, et al.*
- [www.uptodate.com](http://www.uptodate.com)
- [www.emedicine.com](http://www.emedicine.com)
- *Early delivery as an Alternative Management Strategy for Selected High Risk Fetal Sacrococcygeal Teratomas. Flake, et al. Journal of Pediatric Surgery, Aug 2010.*
- *Ashcraft's Pediatric Surgery 5th ed. Holdcomb et al.*