

Does residual testicular volume following partial orchiectomy for malignancy, impact the development of hypogonadism?

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BACKGROUND

Partial orchiectomy is indicated for fertility and Leydig cell preservation in select patients with bilateral malignant testicular masses or a mass in a solitary testicle. Despite organ sparing surgery, these patients are at increased risk of hypogonadism as a result of testicular volume loss, warm ischemia, and adjuvant radiation.

OBJECTIVE

To assess if the residual testicular volume, following partial orchiectomy is associated with hypogonadism and the need for testosterone replacement therapy (TRT).

METHODS

Retrospective chart review of institutional databases for partial orchiectomies at three academic centers from January 2005 - July 2019

Inclusion criteria:

- Patients that underwent a partial orchiectomy for malignancy due to bilateral testicular masses or mass in a solitary testicle
- Post operative total testicular volume was objectively measured by ultrasound

Demographics; pre-operative semen analysis, pathology, oncologic outcomes, pre- and post-operative serum testosterone levels

RESULTS

Patient Characteristics:

Age, Mean (SD)	27.8 (5.6)
Partial Orchiectomy	N=9
Synchronous	n=7
Metachronous	n=2
Pre-orchiectomy semen analysis	
Azoospermia	n=4
Cryptozoospermia	n=1
Oligospermia	n=2
Normospermia	n=1

- **In total, 9 patients underwent a partial orchiectomy and all patients progressed to TRT (mean 11 months)**
- **Mean residual testicular volume was 9.8 ±4.2 mL**
- Mean follow-up 84 months, no patients had evidence of disease at last follow up
- No patients received clomiphene or HCG prior to commencement of TRT
- All three patients that underwent onco-testicular sperm extraction had a successful sperm retrieval
- One patient with negative mapping biopsy declined adjuvant radiation, conceived via natural means; recurred 7 years post-op and required completion orchiectomy

Testosterone (ng/dL)	Mean (SD)	Range
Preoperative	434 (245)	595-842
Postoperative	267 (92)	144-450
Time to start Testosterone (months)	11 (7)	
Testicular tumor size	0.9	0.5-1.8
Post-op testicular volume (mL)	9.8 (4.2)	3.96-16.6
Multimodal Therapy	Before Partial	After Partial
Radiation	-	n=2
Chemotherapy	n=2	n=2
RPLND	-	n=1
Completion orchiectomy	-	n=4
Tumor Pathology		
Seminoma	n=6	
Non-Seminoma	n=3	

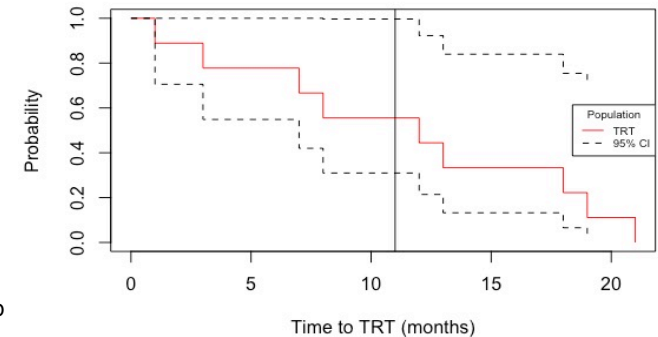


Figure 1: Progression to TRT after partial orchiectomy

CONCLUSIONS

- This is the first study to assess the association of residual testicular volume and the development of hypogonadism following partial orchiectomy.
- **Residual total testicular volume was not protective against developing hypogonadism as all patients who underwent organ sparing surgery ultimately required TRT.**
- Additional studies are needed to determine whether there is a subset of patients for whom partial orchiectomy can preserve gonadal function.