

Testicular cancer

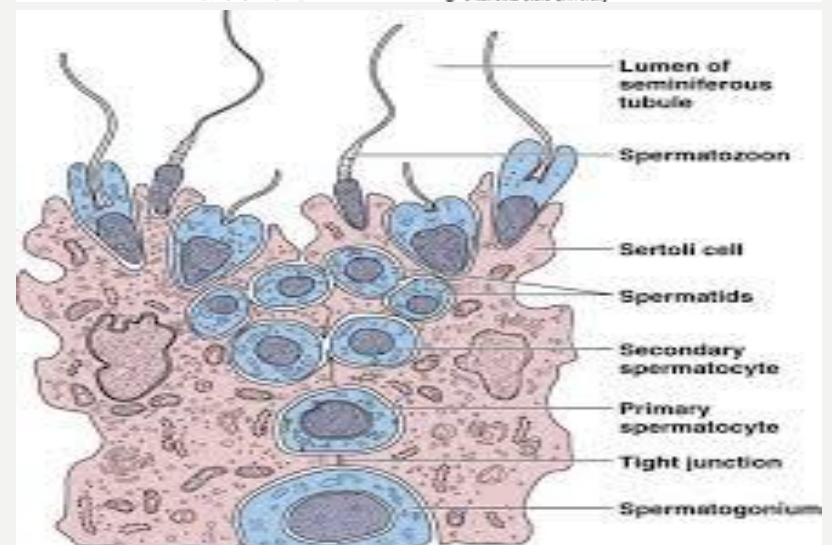
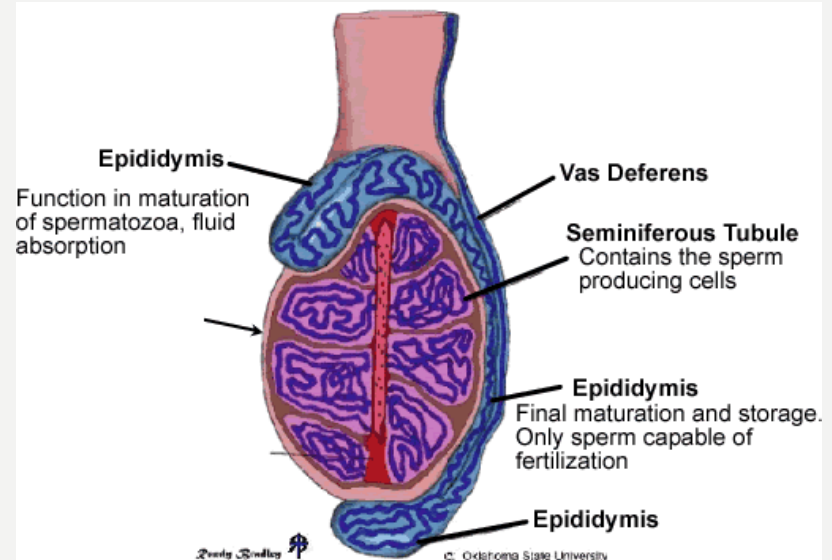
ANATOMY AND EMBRYOLOGY

The testis developed in the **retroperitoneum** below the kidneys at around the **10th** thoracic level.

Reach the scrotum in the ninth month.

The testis is composed of 200-300 lobules of 2-3 seminiferous tubules lined by cells in different stages of spermatogenesis, among them are **Sertoli cells**.

Interstitial cells produce **testosterone** are between the seminiferous tubules.



CONT.

The seminiferous tubules join to form **20-30** straight tubules, then formed the **rete testis** that give rise to **12-30 efferent ductules**,

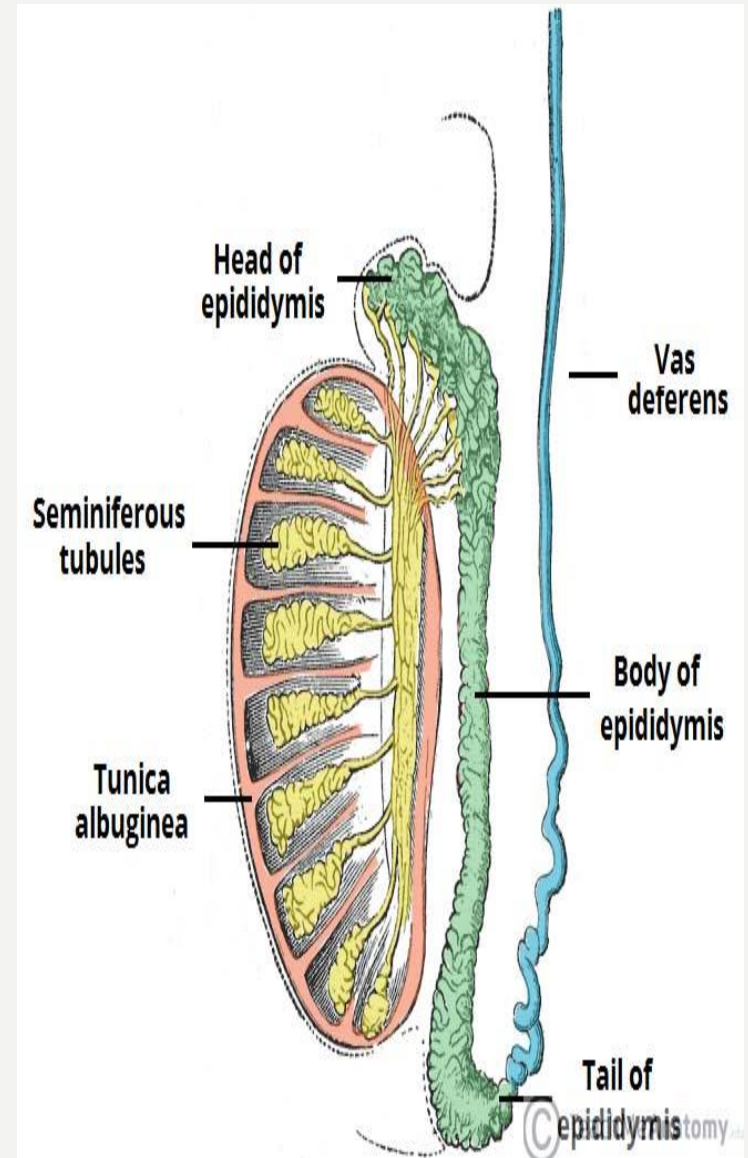
then the **epididymis 6 m** coiled on the posterior surface of testis.

Finally the ductus deferens through the inguinal canal to the abdominal cavity.

Each testis is oval in shape,

weight 10-15 g,

the left one is slightly lower than the right, suspended in the scrotum by the spermatic cord.



CONT.

Arterial blood supply be branches of **abdominal aorta** and collateral from **cremasteric artery** and artery to ductus deferens.

Venous drainage from the right testis to **IVC**, and from the left testis to **left renal vein**.

Lymphatic drainage to retroperitoneal lymph nodes T11-L4, concentrated more at the level of L1-L3.

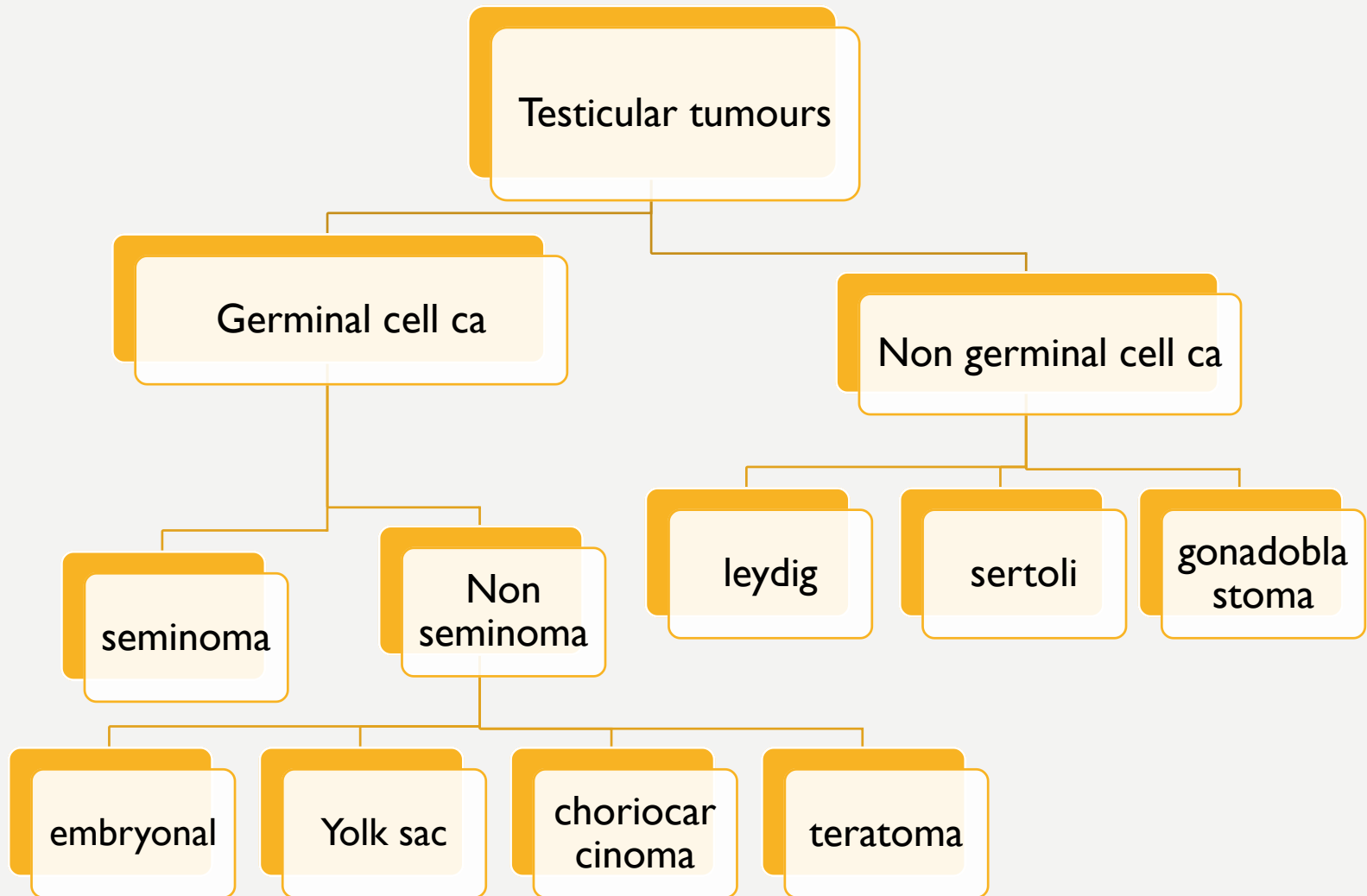
Sympathetic nerves arising from T10 of spinal cord.

EPIDEMIOLOGY

- 1-1.5% of male cancers.
- At age of 15- 35 year old.
- More in white , less in African Americans.
- germ cell tumours (90–95%) all are malignant
 - interstitial tumours (1–2%) usually benign
 - lymphoma (3–7 %)
 - other tumours (1–2%)
- The cause remains unknown.

RISK FACTORS

1. **Cryptorchidism** : absence of one or both testes from the scrotum ,*3- to-5 folds risk of cancer* in the undescended testis, and an increased risk of cancer in the contralateral descended testis.
2. Intersex syndromes.
3. Family history: 8-10-fold increased risk.
4. Cancer in one testis.
5. Intratubular germ cell neoplasia: in post pubertal males
6. Trauma
7. Atrophy
8. Recurrent infection
9. Exposure to environmental estrogen.



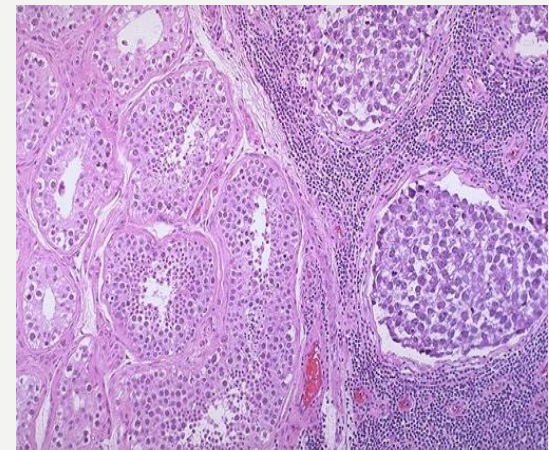
GERM CELL NEOPLASIA

Seminoma

- ✓ 30-40% of all testicular tumors.
- ✓ At 15-35 years old.
- ✓ Rare in prepubertal males.
- ✓ progressive painless enlargement of the testis, histologically identical to ovarian dysgerminomas.
- ✓ Some secrete B-hcg.
- ✓ types; classic, anaplastic, spermatocytic

SEMINOMA

- Soft, well-demarcated.
- Usually without hemorrhage.
- Right > left .



NON SEMINOMATOUS GERM CELL TUMOURS

Embryonal

- Secret AFP and B-hcg.
- Invades epididymis.
- Higher metastasis
- ill-defined, invasive masses containing foci of hemorrhage and necrosis.



CONT.

Yolk sac tumour

- most common in children, < 3year old.
- In adult, has a worst prognosis.
- the **AFP level** correlates with disease extent,
- concentrations >1000 ng/mL often indicating the presence of extensive tumor.
- A distinctive feature is the presence of structures resembling primitive glomeruli, called Schiller-Duval bodies



CONT.

Choriocarcinoma

- Rare and worst prognosis, 5 year survival is 5%.
- Widespread hematogenous dissemination to lung and brain.
- Primary is small, no testicular enlargement.
- Elevated B-hcg.



CONT.

Teratoma

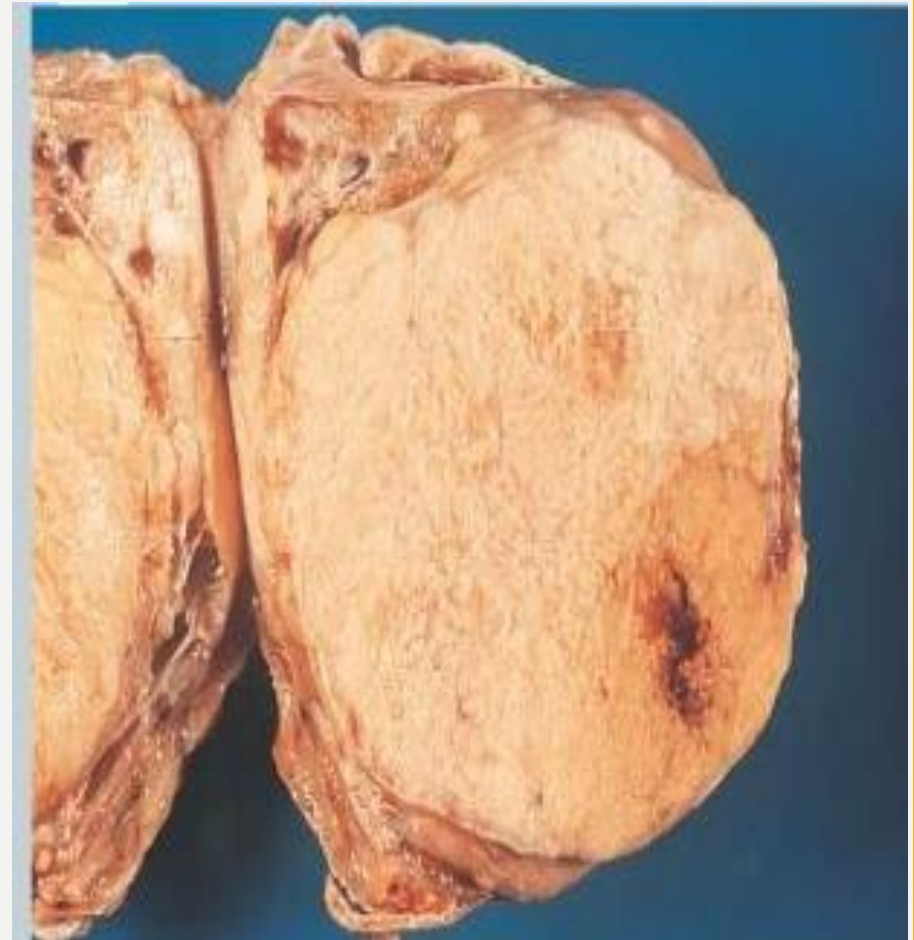
- Contain all 3 germ layers.
- Second in children after yolk sac CA, usually benign.
- In adult are malignant and metastasized whether they are mature or immature.
- Poor response to CTx or Rx.



NON GERM CELL TUMOURS

Leydig cell ca,

- Most common of NGCT
- No association with cryptorchidism.
- Produce androgens
- Precocious puberty.
- Gynacomastia and decreased libido.
- Painless testicular mass.



CONT.

Sertoli cell ca,

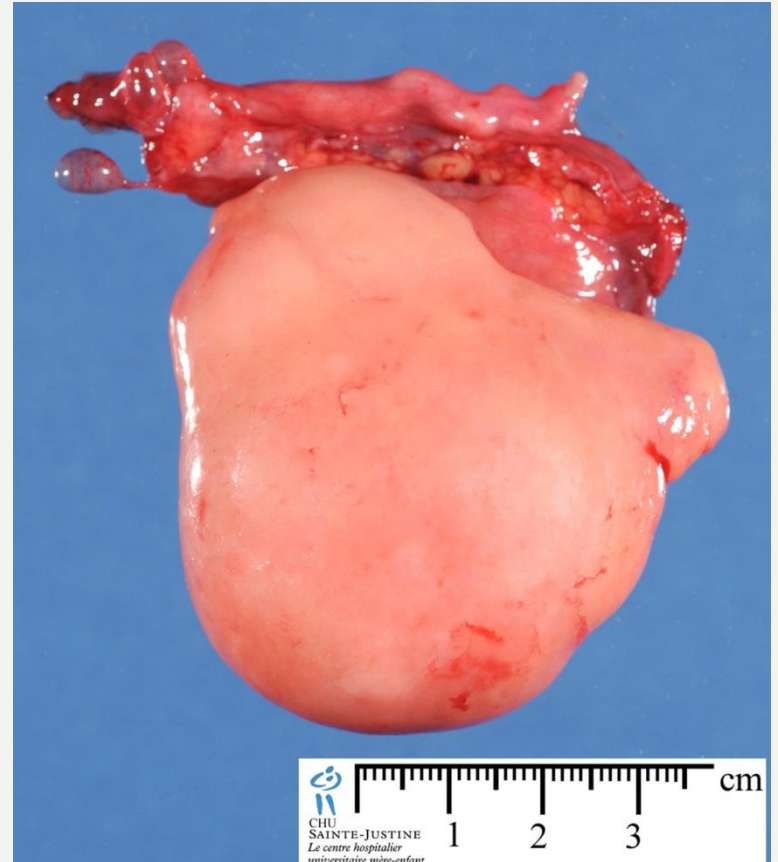
- At any age
- No ass. With cryptorchidism.
- either large cell calcifying or sclerosing types.
- Excess estrogen.
- 10% malignant.



CONT.

Gonadoblastoma ca;

- Mixed germ cell, sex cord, stromal ca.
- arise within dysgenetic gonads.
- In situ malignant of GCT (Giant cell tumors)
- Bilateral orchidectomy due to inc. risk of bilateral tumours.



SPREAD

1. Direct
2. Lymphatic: seminoma
3. Hematogenous: NSGCT, to lung ,
liver, bone and brain.

CLINICAL PICTURE

- **Primary tumour;**

Painless testicular mass.

Heaviness sensation if enlarged $> 2-3$ times.

Sudden pain due to hemorrhage mimicking torsion.

CONT.

Mets ;

- abdominal and lumbar pain.(GI)
- chest pain, hemoptysis, dyspnea .(lungs)
- jaundice.(liver)
- hydronephrosis.(kidneys)
- troiser's sign.(palpable left supraclavicular LN)

CONT.

○ **Physical examination.**

- enlarged testis.
- nodular testis.
- firm to hard consistency.
- Secondary hydrocele.
- flat and difficult to feel epididymis
- Examination for mets.

DIFFERENTIAL DIAGNOSIS

- Hydrocele
- Spermatocele
- Hematoma
- Hernia
- Torsion
- Epididymitis
- TB

WORK UP

- General: history and P.E
- Labs: CBC, LFT, KFT, LDH
- Serum assay: AFP, B-HCG
- Radiology: chest x-ray, CT for abdomen and pelvis, ultrasound for contralateral testis.

TUMOUR MARKERS

	AFP	β -hCG	LDH
Seminoma	0	+	++
Yolk sac tumor	+++	+	+
Choriocarcinoma	0	+++	+
Embryonal carcinoma	+	+	++
Teratoma	0	0	0

+++ , Marker virtually always present in high amount and proportional to volume; ++, marker often seen in variable amount that is proportional to volume of disease; +, marker may be seen in variable amount, but not always; 0, never or seldom associated; AFP, alpha-fetoprotein; β -hCG, beta-human chorionic gonadotropin; LDH, lactate dehydrogenase.

STAGING

AJCC 7th Edition

pTX	Primary tumor cannot be assessed.
pT0	No evidence of primary tumor (e.g., histologic scar in testis).
pTis	Intratubular germ cell neoplasia (carcinoma <i>in situ</i>).
pT1	Tumor limited to the testis and epididymis without vascular/lymphatic invasion; tumor may invade into the tunica albuginea but not the tunica vaginalis.
pT2	Tumor limited to the testis and epididymis with vascular/lymphatic invasion, or tumor extending through the tunica albuginea with involvement of the tunica vaginalis.
pT3	Tumor invades the spermatic cord with or without vascular/lymphatic invasion.
pT4	Tumor invades the scrotum with or without vascular/lymphatic invasion.
NX	Regional lymph nodes cannot be assessed.
N0	No regional lymph node metastasis.
N1	Metastasis with a lymph node mass ≤ 2 cm ; or multiple lymph nodes, none > 2 cm in greatest dimension.
N2	Metastasis with a lymph node mass > 2 cm but not > 5 cm ; or multiple lymph nodes, any one mass > 2 cm but not > 5 cm in greatest dimension.
N3	Metastasis with a lymph node mass > 5 cm in greatest dimension.

CONT.

M0	No distant metastasis.
M1	Distant metastasis.
M1a	Nonregional nodal or pulmonary metastasis.
M1b	Distant metastasis other than to nonregional lymph nodes and lung.

Serum Tumor Markers (S) Required for Staging	
SX	Marker studies not available or not performed.
S0	Marker study levels within normal limits.
S1	LDH $<1.5 \times N$ and hCG (mlu/ml) $<5,000$ and AFP (ng/ml) $<1,000$.
S2	LDH $1.5\text{--}10 \times N$ or hCG (mlu/ml) $5,000\text{--}50,000$ or AFP (ng/ml) $1,000\text{--}10,000$.
S3	LDH $>10 \times N$ or hCG (mlu/ml) $>50,000$ or AFP (ng/ml) $>10,000$.

N indicates the upper limit of normal for the LDH assay.

TREATMENT

Medscape®		www.medscape.com	
Stage	Histology	Treatment	5 Year Survival Rate
I	Seminoma	Orchiectomy, radiation therapy	97%
I	Nonseminoma	Orchiectomy, RPLND, surveillance 1 year	95%
II	Seminoma	<i>Nonbulky Tumor:</i> Orchiectomy and radiation therapy	90%
		<i>Bulky Tumor:</i> Orchiectomy and combination chemotherapy (cisplatin-based regimen) or by radiation therapy	70%
II	Nonseminoma	Orchiectomy and RPLND, followed by combination chemotherapy (cisplatin, bleomycin, etoposide)	95%
III	Seminoma	Orchiectomy and multidrug chemotherapy (cisplatin, bleomycin, etoposide)	95%
III	Nonseminoma	Orchiectomy and multidrug chemotherapy (cisplatin, bleomycin, etoposide)	70%

Source: National Cancer Institute (2002).

SIDE EFFECTS OF TEATMENT

1. Fertility issues; may be treated by semen cryopreservation.
2. N,V, and hair loss.
3. Decreased or absent semen with ejaculation ; m.c with RPLND (Retroperitoneal Lymph Node Dissection) , nerve- sparing RPLND reduce this problem.
4. Lung fibrosis.