

Difference Between Seminoma and Nonseminoma

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Key Difference - Seminoma vs Nonseminoma

Testicular [tumors](#) can be categorized into different subgroups based on their characteristic morphological features. [Seminomas](#) and nonseminomas are arguably the two most frequently encountered varieties of neoplastic lesions in the male [gonads](#). Seminomatous tumors are the [germ cell](#) tumors composed of cells that resemble primordial germ cells or early gonocytes and nonseminomatous tumors contain undifferentiated [embryonic stem cells](#) that can differentiate among different cell lines. Accordingly, **seminomas have differentiated cells, unlike the nonseminomas that are composed of undifferentiated cells that have the potential to differentiate along any cell lineage.** This can be considered as the **key difference** between these tumors.

What is Seminoma?

Seminomatous tumors are the germ cell tumors composed of cells that resemble primordial germ cells or early gonocytes. These are the commonest type of germ cell tumors with a peak incidence in the third decade of life.

These tumors originate from a precursor lesion known as intratubular germ cell neoplasia (ITGCN). This lesion develops in utero and progress into a tumor after the puberty. Microscopic examination of ITGCN shows the presence of cells that are twice the size of normal germ cells with an enlarged [nucleus](#) and a clear [cytoplasm](#).

There are two main morphological varieties of seminomatous tumors as,

- Seminomas
- Spermatocytic seminomas

Seminomas

These are the commonest type of germ cell tumors with a peak incidence in the third decade of life. A similar tumor called the dysgerminoma arises in the ovaries. Seminomas contain 12p isochromosome and express NANOG and OCT3/4. A fair majority of these tumors have KIT mutations also.

Morphologically a classic seminoma is a large tumor which is either round or polyhedral in shape. There is a well-developed cell membrane with a clear or watery cytoplasm. Most of the cells have an enlarged central nucleus with a prominent nucleolus. About 15% of seminomas contain syncytiotrophoblasts in which case the serum hCG levels are elevated.

Spermatocytic Seminoma

This subset of seminomatous tumors predominantly affects older men who above 65 years of age. In contrast to the classic seminomas, Spermatocytic seminomas are slow growing neoplastic lesions, and the incidence is extremely low. Because of the slow rate of growth of these tumors, they have an excellent [prognosis](#).

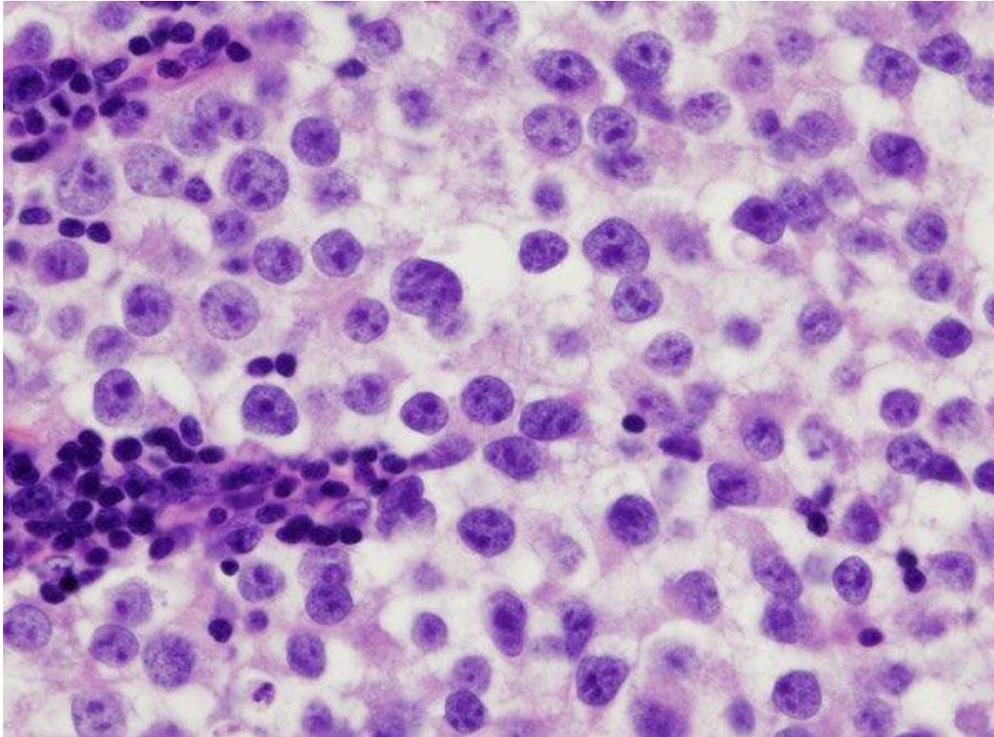


Figure 01: Histological Appearance of a Seminoma

Spermatocytic seminomas are composed of medium-sized cells with an eosinophilic cytoplasm.

What is Nonseminoma?

Nonseminomatous tumors contain undifferentiated embryonic stem cells that can differentiate among different cell lines.

Subcategories of nonseminomatous tumors are,

- Embryonal carcinoma
- Yolk sac tumor
- Choriocarcinoma

Embryonal Carcinoma

These tumors commonly occur in the 20-30 age group and are much more aggressive than the seminomas. Embryonal carcinomas have a tubular or alveolar type of histological arrangement.

Yolk Sac Tumors

This is the commonest testicular tumor in infants and children who are below 3 years of age. Although there is a very good prognosis in the above age group, yolk sac tumors in adults can be life threatening. Histologically these tumors are nonencapsulated and have a mucinous appearance. Papillary structures can also be seldom found within them.

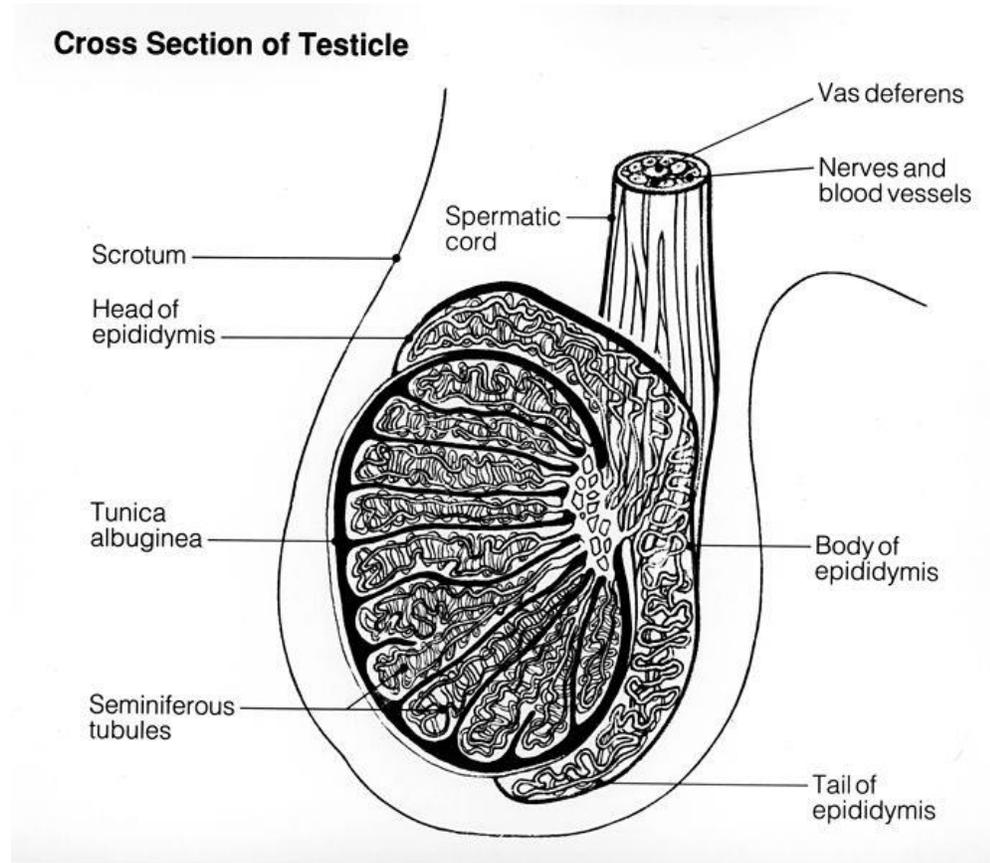


Figure 02: Cross-Section of a Testicle

Choriocarcinoma

Choriocarcinomas are extremely rare but highly aggressive tumors accounting for less than 1% of the total testicular tumors. They do not give rise to an enlargement of the testicles and will be presented as a palpable nodule. There are two cell types in these tumors as syncytiotrophoblasts and cytotrophoblasts.

What is the Similarity Between Seminoma and Nonseminoma?

- Both are different varieties of testicular tumors.

What is the Difference Between Seminoma and Nonseminoma?

Seminoma vs Nonseminoma	
Seminomatous tumors are the germ cell tumors composed of cells that resemble primordial germ cells or early gonocytes.	Nonseminomatous tumors contain undifferentiated embryonic stem cells that can differentiate among different cell lines.

Summary - Seminoma vs Nonseminoma

Seminomatous tumors are the germ cell tumors composed of cells that resemble primordial germ cells or early gonocytes whereas nonseminomatous tumors are the masses that contain undifferentiated embryonic stem cells that can differentiate among different cell lines. Seminomas have differentiated cells, but nonseminomas have undifferentiated cells. This can be taken as the key difference between these tumors.

Reference:

1.Kumar, Vinay, Stanley Leonard Robbins, Ramzi S. Cotran, Abul K. Abbas, and Nelson Fausto. Robbins and Cotran pathologic basis of disease. 9th ed. Philadelphia, Pa: Elsevier Saunders, 2010.

Image Courtesy:

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