

Classification and pathology

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Tumours of the testis are classified according to their predominant cellular type: /uni25CF GCTs (90–95%): these include seminoma, embryonal cell carcinoma, yolk sac tumour, teratoma and choriocarcinoma; /uni25CF sex cord-stromal tumours (1–2%): these include Leydig cell tumours; /uni25CF lymphoma (3–7%); /uni25CF other tumours (1–2%). Seminoma A seminoma typically has a cut surface that is homogeneous and pinkish cream in colour. It appears to compress neighbouring testicular tissue (Figure 86.13). It consists of oval cells with clear cytoplasm and large, rounded nuclei with prominent acidophilic nucleoli. Sheets of cells resembling spermatocytes are separated by a fine fibrous stroma. Active lymphocytic infiltration of the tumour suggests a good host response and a better prognosis. Seminoma accounts for 50% of all testicular tumours. Harry Fitch Klinefelter Jr , 1912–1990, physician of Baltimore, MD, USA, described this syndrome in 1942. - - - - germinal cell tumours. They seldom occur in childhood, in young adults or in patients over 70 years of age. Seminomas metastasise mainly via the lymphatics (Figure 86.14) and haematogenous spread is uncommon. The lymphatic drainage of the testes is to the para-aortic lymph nodes near the origin of the gonadal vessels. The contralateral para-aortic lymph nodes are sometimes involved by tumour spread, but the inguinal lymph nodes are affected only if the scrotal skin is involved. Ultrasound is the first-line investigation (Figure 86.15). Non-seminomatous germ cell tumours There are a number of histological types of NSGCT , which may coexist within a single tumour: /uni25CF Embryonal carcinoma (Figure 86.16) . Highly malignant tumours that occasionally invade cord structures. /uni25CF Yolk sac tumour . Usually present with a loose stroma and a component similar to embryonal carcinoma, sometimes with liver and intestinal tissue differentiation. It appears as a single tumour type in children and part of a

Figure 86.13 Seminoma of the testis. Figure 86.14 Lymphatic drainage of the testes to para-aortic lymph nodes. Figure 86.15 Ultrasound of a small seminoma with minimal distortion of the tunica albuginea (courtesy of Dr Davide Prezzi).

mixed tumour in adults. They produce alpha-fetoprotein (AFP), which can be measured in serum. /uni25CF Teratoma (Figure 86.17). Teratomas consist of different tissues derived from ectoderm, endoderm and mesoderm. Immature components are often neuroectodermal or mesenchymal tissue, while more mature tissue is often cystic with epithelial differentiation or consists of smooth muscle, connective tissue or cartilage. Since most teratomas consist of a mixture of tissues, the old separation into mature and immature types has been abandoned. All can metastasise. /uni25CF Choriocarcinoma . This is part of a testicular GCT in 25% of tumours in adults. It very seldom appears as the single tumour component. Choriocarcinoma is almost never seen in childhood. This tumour produces human chorionic gonadotropin (HCG), which can be detected in blood. This is a highly malignant tumour that metastasises early via both the lymphatics and the bloodstream. Spermatocytic seminoma This tumour was earlier believed to be a variant of seminoma, but is now considered to be a separate tumour type, accounting for 1–2% of all GCTs of the testis. Only seen

in adult men usually >50 years old, they rarely metastasise; therefore, an orchidectomy is the only necessary treatment, even in large tumours. Development of sarcomas has been reported when left untreated for long time.

Sex cord-stromal tumours Sex cord-stromal tumours are rare and constitute less than 5% of testicular neoplasms.

Leydig cell tumour Leydig cell tumours are the most common type of sex cord-stromal tumours, constituting 1–3% of adult testicular tumours and 3% of testicular tumours in infants and children. These tumours occur in about 8% of patients with Klinefelter's syndrome.

John Law Augustine Peutz , 1886–1968, Chief Specialist for Internal Medicine, St John's Hospital, The Hague, The Netherlands. Harold Joseph Jeghers , 1904–1990, Professor of Internal Medicine, New Jersey College of Medicine and Dentistry , Jersey City , NJ, USA. - syndrome. They are well delineated on histology and usually up to 5 cm in diameter. They are solid, yellow to tan in colour with haemorrhage and/or necrosis in 30% of cases. Most of these tumours are benign. Malignant transformation occurs in 10% and is related to increased size (>5 cm), increased cellular atypia, increased cell proliferation, necrosis, vessel invasion and DNA aneuploidy.

Sertoli cell tumour Sertoli cell tumours account for less than 1% of testicular tumours, and the mean age at diagnosis is around 45 years, with sporadic cases under 20 years of age. Rarely , these occur in patients with androgen insensitivity syndrome and Peutz–Jeghers syndrome. The rate of malignancy ranges between 10% and 22%.

Figure 86.16 Ultrasound of a large embryonal carcinoma occupying nearly the whole testis; long, longitudinal view; trans, transverse view (courtesy of Dr Davide Prezzi). (b) Figure 86.17 Teratoma of the testis specimen (a) . Note the solid and cystic areas (courtesy of Dr Keith Simpson, London, UK). Testicular ultrasound (b) . The homogeneous tissue of the testicular teratoma on the left of the image produces multiple ultrasound reflections.

Granulosa cell tumours of the testis are extremely rare in adult men, but a juvenile type accounts for 6% of testis tumours in childhood.

Mixed germ cell/sex cord tumour: gonadoblastoma This tumour consists of two cell types: large germinal cell-like seminoma cells and small granulosa-like or Sertoli cells or rarely Leydig/luteinised cells. Gonadoblastoma is seen in individuals with mixed gonadal dysgenesis (risk 15–25%), which is associated with cryptorchidism, hypospadias, gynaecomastia or female internal genitalia. It seldom occurs in phenotypical and genotypical males.

Revision #1

Created 2025-12-31 15:31:07 UTC by Omar Ayman

Updated 2025-12-31 15:31:07 UTC by Omar Ayman