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Diagnosis and Treatment of Testicular Cancer

Renate Minchom*

Department of Oncology, University of Hawai, Manoa, United Kingdom

Commentary

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***For Correspondence:** Renate Minchom, Department of Oncology, University of Hawai, Manoa, United Kingdom

E-mail: renate.minchom@icr.ac.uk

DESCRIPTION

Testicles are a part of the male reproductive system that can develop testicular cancer. The testicle may develop a lump, and the scrotum may swell or hurt. Infertility may develop after treatment.

Underdeveloped testicles, a family history of the condition, and a prior diagnosis of testicular cancer are the risk factors. Germ cell tumours, which are classified as seminomas and non-seminomas, are the most prevalent type. Sex-cord stromal tumours and lymphomas are other varieties.

Blood tests, ultrasounds, and physical examinations are frequently used to make diagnoses. To ascertain the type, the testicle is surgically removed and examined under a microscope. Testicular cancer is typically curable and very treatable. Surgery, radiation therapy, chemotherapy, and stem cell transplantation are all possible forms of treatment. Chemotherapy has a cure rate of over 80%, even in cases where the cancer has spread widely. About 686,000 people experienced testicular cancer on a global scale in 2015. It caused 9,400 deaths that year, up from 7,000 deaths in 1990. The developing world has lower rates than the developed world.

Males between the ages of 20 and 34 most frequently experience onset, rarely occurring before the age of 15. In the United States, the five-year survival rate is around 95%. When the disease is kept localised, the results are better.

The majority of testicular germ cell tumours is triploid to tetraploid and has an excessive number of chromosomes. About 80% of testicular cancers have an isochromosome 12p (the short arm of chromosome 12 on both sides of the same centromere), and most other cancers also have extra material from this chromosome arm due to other forms of genomic amplification.

Cryptorchidism is a significant risk factor for the occurrence of testicular cancer (undescended testicles). According to general consensus, tumours are a factor in cryptorchidism; when both conditions coexist, the tumours have a

tendency to be large. Inguinal hernias, Klinefelter syndrome, and mumps orchitis are additional risk factors. Sedentary lifestyles are linked to increased risk, while physical activity is linked to decreased risk. Male characteristics that appear early put people at risk. These could be an indicator of endogenous or external hormones.

Diagnosis

A mass or lump inside a testis is the primary indicator of testicular cancer. More generally, doctors should be suspicious of testicular cancer if a young adult or adolescent has a single enlarged testis that may or may not be painful.

Embryonal carcinoma, seminoma, and yolk sac tumour all comprise this mixed germ cell tumour. The embryonal carcinoma component (upper left, upper right, and lower left) exhibits pseudoglandular growth and high-grade characteristics, including pleomorphism, frequent mitoses, large, epithelioid, anaplastic cells with prominent nucleoli, and indistinct cell borders with nuclear overlapping. Large, round, polyhedral cells with distinct cell membranes, an abundance of clear or watery cytoplasm, sizable central nuclei, and noticeable nucleoli are visible in the seminoma component (upper centre). A microcystic/reticular growth pattern is present in the yolk sac component (lower right, encircling the embryonal component).

Testicular cancer-like symptoms can also be present in other diseases:

- Epididymitis or epididymoorchitis
- Hematocele
- Varicocele
- Orchitis
- Inflammations that have spread to the testicles or scrotum and caused swelling in their blood vessels, such as prostatitis (an infection or inflammation of the prostate), cystitis (an inflammation of the bladder), nephritis (an inflammation of the kidneys), or kidney (renal) infections (prostatitis).
- Torsion of the testicles or a hernia.
- Conditions of the lymph nodes or blood vessels close to the scrotum, testicles, pubis, anorectal region, and groyne that are infected, inflammatory, retro-peritonitis, or other conditions.
- Testicular benign tumours or lesions.
- Scrotal ultrasound is frequently used to assess the nature of any palpable lump in the scrotum. This procedure can pinpoint the lump's precise location, measure its size, and identify some of its characteristics, such as whether it is solid or cystic, homogeneous or heterogeneous, well-defined or ill-defined. CT scans are used to find metastases and assess the severity of the disease.

Examining the histology of tissue taken from an inguinal orchiectomy, or surgical removal of the entire testis and any attached structures, is necessary for the differential diagnosis of testicular cancer (epididymis and spermatic cord). A biopsy shouldn't be done because it increases the chance that cancer cells will spread to the scrotum.

The preferred procedure is inguinal orchiectomy because it reduces the possibility of cancer cells escaping. This is due to the fact that the lymphatic system of the testicle connects to the back of the abdominal cavity, whereas the lymphatic system of the scrotum connects to the lower extremities, through which white blood cells (and possibly cancer cells) flow in and out (the retroperitoneum). In contrast to an inguinal orchiectomy, which only blocks the

retroperitoneal route, a trans-scrotal biopsy or orchiectomy may result in the retention of cancer cells in the scrotum.

Testicular cancer-specific tumour markers, which are typically proteins found in the bloodstream, are also found and measured using blood tests. The most common tumour markers used to identify testicular germ cell tumours are alpha-fetoprotein, human chorionic gonadotropin (also known as the "pregnancy hormone"), and LDH-1.