Stages of Testicular Cancer

The stage of cancer diagnosis refers to the severity and aggressiveness of the cancer. A ranking will describe how far the cancer has spread and will help determine what treatment options may be best, as well as determining prognosis.
In addition to numeral rankings, the letters T, N, M, and S help further specify the intensity of the disease based on standards set by the American Joint Committee on Cancer. The TNM is the most useful and universal staging system used by physicians today.

The TNM System:

T: TUMOR- assesses the depth of the primary tumor and whether or not it has spread into tissues nearby to the testicle

- TX: it is not possible to measure the tumor
- T0: a tumor has not been found
- Tis: abnormal cells are found in situ—they are only found in the outermost layer of tissues and have not grown into deeper tissues (also called pre-cancer)
- T1, T2, T3, and T4: refer to the depth of the primary tumor and the various layers that is involved

N: NODE- confirms if cancer has spread into lymph nodes near the testicle

- NX: it is not possible to evaluate the lymph nodes
- N0: cancer is not detected in nearby lymph nodes
- N1, N2, N3: extent to which cancer has invaded lymph nodes based on size and number of nodes involved

M: METASTISIS- refers to spreading of the cancer to distant lymph nodes, organs, and other body parts

- MX: physicians are unable to evaluate metastasis
- M0: distant spread of cancer was not found
- M1: cancer has been detected in distant tissues or organs—meaning the cancer has spread to other body parts

S: SERUM (not used in the TNM system) determines whether tumor markers that are created by some testicular cancers are present in the blood. Serum tumor markers unique to testicular cancer include alpha-fetoprotein (AFP), beta human chorionic gonadotropin (hCG), and lactate dehydrogenase (LDH). Elevated levels of any of these markers may be suggestive of a germ cell tumor. Levels should be collected throughout your treatments and at follow ups to see if the tumor is responding to treatment or if relapse occurs.

It is important to speak with your doctor regarding the ranking system—a different version exists for each type of cancer. Speaking with your physician will ensure you receive the correct information for testicular cancer and what it means for your diagnosis.

Numerical Staging:

Once physicians have assessed the T, N, and M values for a patient, the three values are combined to determine an overall stage from I-III (1-3). The stages increase in severity. A lower stage is associated with better prognosis.

Stage 0

- Also called carcinoma in situ
- Abnormal cells are present, but they have not become cancer or spread to neighboring regions
- Often called "precancerous"

Stage I:

- The earliest stage
- Cancer has been detected, but has not spread out of the testicle into lymph or organs
- 1s indicates that serum levels are elevated after surgery

Stage II:

- The cancer has spread into neighboring lymph nodes
- The letter assigned next to the stage number describes the size of the lymph node
    - 2A: smaller than 2 cm
    - 2B: 2-5 cm
    - 2C: 1 or more (at least one) lymph node is bigger than 5cm

Stage III:

- Cancer has metastasized to distant lymph nodes or any organ in the body
    - 3A: cancer has been detected in the lungs or distant lymph nodes. Serum marker levels are normal or only slightly elevated
    - 3B: cancer has metastasized to the lungs or distant lymph nodes. Serum marker levels are consistently moderate-high
    - 3C: can be either or both of the following:
        - cancer has spread to organs (other than the lung)
            - formerly called stage 4 testicular cancer
        - cancer has spread to one or more lymph nodes or organs and serum marker levels are very high

Recurrent cancer: cancer that has returned after treatment. It will need to be re-staged and treated accordingly.

Risk Assessment:
3 risk groups are identified based on level of tumor markers, sites of metastases and the origin of germ cell tumors. They are good risk, intermediate risk and poor risk. Treatment and cure varies depending on which group you are in.

Two Major Types of Staging:

1. **Clinical Staging**
    - Clinical staging uses tumor biopsies, blood tests, physical examinations, CT scans, x-rays, and other imaging tests to estimate the extent/severity of a cancer. The clinical stage is important when deciding on treatment plans and also provides a good reference to see if treatment is working.
2. **Pathologic Staging**
    - Pathologic staging (surgical staging) gives doctors a more accurate portrayal of the cancer's presence in the body. Tissue samples from the body, taken out as part of treatment or just to see how much cancer is in area, give doctors more precise information about the cancer. This information is used in treatment decisions and in determining a prognosis. It can also be used to see if the treatment is working.

Additional Factors Affecting Stage Determination:

Grade: Grade refers to the differentiation of cells; that is, how abnormal they appear when examined under a microscope. Cells are given a "grade" from 1-4. The more abnormal the cell is, the higher the grade will be. A grade of 1 means cells resemble normal tissue. A grade of 4 means they are more distorted. Grading can be an important factor in deciding on a treatment plan because the more abnormal a cell looks, the quicker it grows or spreads.

Tumor Marker Levels: Specific tumor markers found in the blood may indicate the presence of testicular cancer. The amount of this tumor marker in the blood can be considered when diagnosing. The tumor markers indicative of testicular cancer include AFP, hCG, and LDH.

Cell Type: The type of cancer cell present can affect treatment regimes and prognosis. Most testicular cancer cells develop from germ cells, the cells that produce sperm. In rare cases, testicular cancer develops from stromal tumors.

The Two Types of Germ-Cell TC:

- Testicular cancer is divided into many subsets. The two most common are seminomas and nonseminomas, which account for the majority of TC cases. It is

important to remember that these numbers are just averages and they can occur to any male at any age!

Seminomas:

- Classical seminomas: generally occur in men 30-50 years old
- Spermatocytic seminomas: typically seen in men over the age of 55 and are less common

Non-seminomas:

These are more common than seminomas and grow/spread more rapidly. Because of this, they are more difficult to cure. If seminoma and nonseminoma cancer cells are seen, the cancer will be diagnosed as nonseminoma overall because more aggressive treatment options will need to be used for this type of TC. They are usually seen in younger men (15-40) but can affect men of all ages. They are further subdivided based on the cell types.

- Choriocarcinoma: highest risk of metastasizing to other body regions but very rare
- Teratoma: lowest risk of metastasizing to other body regions
- Embryonal carcinoma: intermediate risk of metastasizing
- Yolk sac carcinoma: intermediate risk of metastasizing

Stromal tumors (not germ cell tumors):

Stromal tumors are very rarely seen in adults (account for 1 in 20 testicular tumors seen in adults), but are more common in young boys (1 in 5). The tumor originates in the supportive tissue of the testicle, but typically is localized to the area and is not cancerous. In rare cases where cancerous stromal tumors are present and have spread, a poorer prognosis may be given because stromal tumors do not respond well to chemo or radiation. The two most common types of stromal tumors are Leydig cell tumors and Sertoli cell tumors.

Secondary Testicular Tumors

Cancers are named after the area they originate in. Secondary testicular tumors are not true testicular cancers because the cancer did not originate in the testicle. Secondary testicular tumors describe other cancers that have spread to the testicles. The tumors will be treated based off of the type of cancer it really is and prognosis will be dependent upon that as well.

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