Hodgkin's Lymphoma

Hodgkin's lymphoma (Hodgkin's disease) usually develops in the lymphatic system, a part of the body's immune system. This system carries disease-fighting white blood cells throughout the body. Lymph tissue makes up the lymphatic system. It is located throughout the body; neck, armpits, chest, and groin. This is why the disease can start in almost any part of the body. It can also spread to almost any organ or tissue, including the liver, bone marrow, and spleen.

This type of cancer is very treatable. It occurs mainly in young adults, usually between the ages of 16 and 34 years. Older patients, especially those over age 55, may also develop it. It is very treatable even for patients with advanced disease and the survival rate is high.

Symptoms

Common symptoms may include painless swelling of lymph nodes, often in the neck or under the arm. You may also have fever, night sweats, unexplained weight loss, chills, lack of energy or fatigue, and itching. A cough and shortness of breath or chest discomfort may be early signs of this disease in the chest. An enlarged liver and spleen may also occur.

Types

Hodgkin's lymphoma is divided into subtypes. It is based on how the lymph nodes look under the microscope. The tumor type provides important information that may affect treatment choices.

**Nodular Sclerosing Hodgkin's Lymphoma**
Mixed areas of normal cells, Reed-Stemberg cells, and noticeable scar tissue are found in the lymph nodes. It is the most common type and makes up 60 to 80% of all cases. It is more common in children and young adults, but can occur at any age.

**Lymphocyte-Rich Classical Hodgkin's Lymphoma**
This is a new subtype that is sometimes confused with some main lymphocyte cases. It acts more like mixed cellularity Hodgkin's lymphoma.

**Mixed Cellularity Hodgkin's Lymphoma**
Many Reed-Stemberg cells in addition to several other cell types are found in the lymph nodes. Mixed cellularity accounts for about 5 to 30% of all cases of Hodgkin's lymphoma. It mainly affects older adults.
Lymphocyte Depletion Hodgkin's Lymphoma
A large number of Reed-Stemberg cells are found in the lymph nodes. But, very few other cell types are found. It is the least common form of Hodgkin's lymphoma and found in less than 5 percent of the cases. It is seen more often in elderly or in patients with AIDS.

Nodular Lymphocyte Predominant Hodgkin's Lymphoma (NLPHL)
This type is not considered a classical Hodgkin's lymphoma. It lacks some of the features that identify Hodgkin's lymphoma and also Non-Hodgkin's lymphoma. Most of the lymphocytes found in the lymph nodes are normal. Abnormal cells, known as "popcorn cells" are a special type of B-cell found in the nodular kinds. NLPHL accounts for about 5 or 6% of Hodgkin lymphoma cases. It affects more men than women. The average age of patients are in their mid-30s. It is usually diagnosed at an early stage and the chance of recovery is excellent.

Cancer Staging
After diagnosis, your doctor will order tests to help determine the extent of your disease. This is known as "staging". Stage describes the extent to which the tumor has spread in the body. Staging is important. It helps to predict outcome (prognosis) and determines the treatment approach.

Stage I (early stage): One lymph node region is involved.

Stage II (local advanced disease): The cancer is found in two or more lymph regions on one side of the diaphragm or the cancer is found in one lymph node region plus a nearby area or organ, a condition known as "extension," or "E" disease.

Stage III (advanced disease): The disease involves lymph nodes both above and below the diaphragm or one node area and one organ on opposite sides of the diaphragm ("E" disease).

Stage IV (widespread disease): The lymphoma is outside the lymph nodes and spleen and has spread to one or more organs such as bone, bone marrow, skin, and other organs.

The stage is also broken down into A or B. "A" means no symptoms of fever, drenching sweats, or unexplained weight loss. "B" is assigned to their stage when patients do have these symptoms.

Tests
You will receive a handout about each test used to determine the stage of disease. Your doctor or nurse will describe your tests in more detail and will talk to you about how these tests are scheduled.

Biopsy
A biopsy is the removal of a tissue sample that is then evaluated under a microscope. Hodgkin's lymphoma is diagnosed by looking at cancer cells to determine how they are growing in the lymph nodes or other tissues. The information from this tissue sample is used to help diagnose
and treat Hodgkin's lymphoma.

**X-Rays**
This procedure uses radiation to take pictures of the area inside the body.

**Computerized Tomography (CT) Scan**
A CT scan takes x-rays from different angles around the body. The x-ray pictures then use a computer to give a detailed image. It is common to order CT scans of the neck, chest, abdomen, and/or pelvis.

**Positron Emission Tomography (PET) Scan**
A PET/CT scan uses a radiotracer to measure important body functions such as blood flow, oxygen use, and sugar (glucose) metabolism. This helps doctors diagnose, stage, and monitor your response to treatment for your disease.

**Magnetic Resonance Imaging (MRI)**
MRI is a diagnostic test that uses magnetic fields and radio (sound) waves to create computerized images of the brain, spine, bones, and soft tissue such as organs, muscle, cartilage, ligaments, and tendons.

**Blood Tests**
Blood tests are done to determine if different types of blood cells are normal in numbers and appearance when viewed under a microscope. These tests also check to see if blood chemistry is normal. Other standard tests include liver and kidney function, B₂ microglobulin and LPH and other chemical tests.

**Bone Marrow Aspiration and Biopsy**
Blood cells are produced mainly in the bone marrow. The marrow is the soft, spongy center part of the bone. Bone marrow aspiration and biopsy tests show how well the bone marrow is working. During a bone marrow aspiration, a sample of fluid with bone marrow cells is taken from the bone marrow. In a bone marrow biopsy, a sample of solid bone core is removed. The sample is taken from the hipbone.

**Echocardiogram**
This test evaluates the size and function of the heart.

**Multiple Gated Acquisition (MUGA) Scan**
This scan is a test used to assess heart function. The MUGA scan produces a moving image of the beating heart. It provides several important features that can be used to determine the health of the cardiac ventricles – the heart’s major pumping chambers.

**Pulmonary Function Test**
This test determines how well the lungs function. It is an important test since some drugs used to treat Hodgkin's Lymphoma may affect the lungs.
Treatment

The treatment for Hodgkin’s lymphoma depends on the disease stage. Treatment may involve chemotherapy, radiation therapy, bone marrow and stem cell transplant or a combination of these treatments.

Chemotherapy

Chemotherapy (chemo) is the use of medicines to treat cancer. It kills or slows the growth of the cancer. There are many types of chemo medicines to treat lymphomas. Doctors may prescribe a single chemo medicine or use a combination of many chemo medicines. Chemo medicines vary in the way it attacks the cancer cells and often have different side effects. Giving several of these chemo medicines at once may improve the success of treatment, but it may also increase the number of side effects.

Radiation Therapy

Radiation is a special kind of energy carried by waves or a stream of energy particles. It may be delivered by a radiation machine or from radioactive substances injected through the bloodstream. External beam radiation equipment is used to aim the radiation at tumors or areas of the body where there is lymphoma. It kills the cells in the area where the radiation beam was aimed.

Stem Cell Transplant/Bone Marrow Transplant

Autologous or allogeneic stem cell transplant (SCT) and peripheral blood stem cell transplant (PBSCT) are procedures that restore the supply of normal stem cells that are destroyed by high-dose chemotherapy and/or radiation therapy. In an autologous transplant, the bone marrow or blood stem cells are collected from the patient. In an allogeneic transplant, the bone marrow or blood stem cells are collected from a matched donor of a related or unrelated (non-family) individual.

In a bone marrow transplant, stem cells are taken from inside the donor or patient's hip bone. In peripheral blood stem cell transplant, the cells are collected from the blood using a procedure called apheresis. This is similar to donating blood. Before the transplant procedure, patients receive large doses of anti-cancer medicines, alone or in combination with radiation, in order to destroy as many cancer cells. The patient then receives the bone marrow or stem cell transplant. Bone marrow collection for transplants is not done very often. Instead, peripheral stem cell collection is used most often to collect stem cells.

Common Drugs or Protocols

Your doctor or nurse will talk to you about the specific drugs for your treatment protocol. You will receive a handout that describes each drug and a treatment calendar. Common drugs used for treatment include the following:

**ABVD**: Doxorubicin, Bleomycin, Vinblastine, Dacarbazine

**BEACOPP**: Bleomycin, Etoposide, Doxorubicin, Cyclophosphamide, Vincristin, Procarbazine, Prednisone, G-CSF
Relapse or Recurrence

Many patients with this disease are treated and go into remission. But, there is a chance that the disease could come back later. This is called a relapse. Another biopsy is often done when a patient has a relapse. More chemo or radiation therapy may be needed to control the cancer.

If the cancer was a low grade, it may sometimes return (recur) as a higher grade of the disease. This is called “transformation.” In this case, the treatment may be different from what was given before. There is always a chance that the cancer may recur. So, it is very important to see a doctor for regular follow up exams. If the cancer returns and it is found early, you have a better chance of controlling it. Your doctor will explain the chances of relapse and your plan for follow up visits.