Multiple Myeloma

Chapter 1 Blood Cell Production

Blood is comprised of several types of blood cells. They are developed from stem cells which reside in the bone marrow. Bone marrow is a spongy, red tissue found in the inside of bones. Bone marrow is more concentrated in the breastbone, ribs, pelvis, skull, vertebrae, humorous, and femur.[1]

The stem cells grow to become either white blood cells, red blood cells, or blood platelets. White blood cells, including plasma cells, help to fight infection and clean up damaged or dead tissue cells. Red blood cells carry oxygen that is inhaled through the lungs to tissues and organs. Blood platelets support blood coagulation. Once the blood cells and platelets grow, they are released into the bloodstream from the bone marrow.[2]

Chapter 2 Plasma Cells

Plasma cells are part of the white blood cell group. They make antibodies, called immunoglobulins, to protect the body from viruses, bacteria, and foreign invaders. Antibodies are also proteins. A single plasma cell makes one type of antibody. Plasma cells multiply during infections with the goal to build up an army for protection.[3]

Chapter 3 Multiple Myeloma

Multiple myeloma is an uncontrolled growth of a plasma cell from within the bone marrow. This malignant proliferation occurs in places with high concentrations of bone marrow like the breastbone, ribs, pelvis, skull, vertebrae, humorous, and femur. Multiple myeloma is also defined by highly specific biomarkers and markers of end-organ damage.[4,5]

“Multiple myeloma” means more than one malignant plasma cell. It is also known as Kahler’s Disease. An internist, Otto Kahler, was the first person to describe a patient with multiple myeloma in 1844. There is no cure for multiple myeloma. It is a rare disease, and it usually occurs in adults older than 60 years of age. There is no known cause of the disease.[4]

Chapter 4 Bone Disease

A certain type of plasma cell grows uncontrollably in multiple myeloma. This creates a greater concentration of only one type of antibody. The uncontrolled growth of the one type of plasma cell overcrowds and inhibits the production of other plasma cells and therefore inhibits the creation of other types of antibodies. This leads to a lower level of other plasma cells circulating in the blood. Uncontrolled growth of a plasma cell type can also inhibit the production of red blood cells and lead to anemia.[6]

Osteoblasts are cells that make up bones. They do not work properly in multiple myeloma. Osteoclasts are cells that break down bones. They become active in multiple myeloma and form osteolytic lesions, which are holes in the bone. This can lead to osteoporosis or bone decalcification. An individual may experience bone pain, fractures, and collapsed vertebrae.[6]