Role of Radiation Therapy for Multiple Myeloma

Multiple myeloma (also called myeloma) is a cancer that affects the plasma cells, which are found in the blood. In myeloma, the plasma cells grow out of control and overcrowd the bone marrow where blood cells are made. This prevents the normal production of other blood cells and keeps the immune system from working well. Myeloma cells can also affect cells that help keep bones strong, causing weakened bones, bone pain, bone fractures (breaks in the bone), and spinal cord compression (bones in the spine pressing on the spinal cord).

Another plasma-cell disease that is like multiple myeloma is solitary plasmacytoma (SP). Individuals with SP do not have myeloma cells in the bone marrow or body. Instead, they have a tumor made up of plasma cells that are only in one area of the body. Often, these tumors are in the bone and are called solitary bone plasmacytoma (SBP). People with solitary plasmacytoma may eventually develop multiple myeloma.

Lytic lesions, also known as bone lesions, are spots where the bone has been damaged, leaving a hole in the bone. Lytic lesions are caused by the imbalance between the breakdown of old bone tissue and the building of new bone tissue. Too much bone breakdown and too little bone build-up results in weakened bones, leading to lytic lesions.

How is radiation treatment used for multiple myeloma?

External beam radiation therapy can be used to kill groups of cancer cells or to treat areas of bone damaged by myeloma. Killing these cells can also lessen the pain caused by them. Radiation therapy is rarely the main treatment for multiple myeloma but rather used with other treatments (chemotherapy, surgery, or stem cell transplant) to help fight the disease.

What are some reasons that your provider might recommend radiation?

- Lessen bone pain that hasn’t responded to other treatments.
- Prevent a bone fracture.
- Prevent spinal cord damage if the bones of the spine were to collapse.
- Treat a single plasma cell tumor (plasmacytoma).

How is the number of radiation therapy fractions (treatments) decided?

The ideal dose of radiation for solitary bone plasmacytoma (SBP) is not well established. Based on several studies that have been done, there are recommended guidelines based on the size of your SBP. You will likely receive 20-25 treatments.

Lower doses of radiation are enough to help relieve symptoms if you have bone lesions from multiple myeloma. This is often called palliative radiation. “Palliative” means the goal is to relieve symptoms caused by the cancer. The recommended guidelines for the number of treatments for palliative radiation therapy for multiple myeloma are:

- Bone sites where the goal is symptom relief:
  - Hypofractionation (larger doses of radiation given less often): 1-10 fractions.
  - Conventional fractionation: 10 to 15 fractions.
- Spinal cord compression treatment: 10 to 15 fractions.

What are the side effects of radiation?

- Skin changes in the treatment area.
- Feeling tired (fatigue).
- Nausea.
- Diarrhea (if treatment area includes stomach or pelvis).
- Low blood counts.

**How effective is radiation therapy for multiple myeloma?**

In a study of about 500 people with multiple myeloma, 55 people received radiation for treatment of pain. Of those 55 people who received radiation, 75% reported that it eased their pain. Radiation has been shown to be effective for multiple myeloma treatment. These include cases where a tumor is pressing on your spinal cord, there is bone pain due to a tumor, to prevent bone fractures, or to treat a single plasma cell tumor.