

CHOOSING EFFECTIVE THERAPY FOR BONE METASTASES

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Bone metastases occur when cancer gains access to the blood stream and spreads to the bone. The blood vessels act as a highway transporting cancer cells to distant sites of the body. Because of this transportation mechanism, no site is protected once cancer cells spread. That explains the emphasis on early detection and cure. While the bone is not a unique site of metastases, it is certainly special in that bone metastases often cause pain and disruption or fracture of the bone and can have severe consequences.

A new study by Townsend et al from the University of Kansas published in the Journal of Clinical Oncology analyzed the effectiveness of radiation after surgery for cancers that have spread to the bone - so-called bone metastases.

A significant share of patients with cancer develop bone metastases - some would predict 50%. Many of these patients have growth of the cancer in the bone so that the integrity of the bone is disrupted. Once the bone is weakened, it may break (fracture). The fracture occurs because the integrity of the bone is lost due to the growing metastatic cancer.

Various treatment options exist for those with bone metastases whose bone has not broken. These choices include fixation with a surgically-placed rod and/or radiation. Fixation of the bone is a surgical maneuver to stabilize the bone. For those whose cancer has snapped the bone, surgical intervention is offered in some circumstances to stabilize the bone prior to radiation.

A study from the University of Kansas evaluates the effectiveness of radiation after surgical intervention for bone metastases.

The authors reported on 95 patients evaluated between 1979 and 1992. All patients had disease spread to long bones such as the femur (thigh bone), hip joint or humerus (upper arm bone). Some patients had fracture and others had what was called "an impending pathologic fracture," suggesting that if intervention was not undertaken, a fracture would have occurred. Twenty eight additional patients were registered from the Research Medical Center. If patients had prior radiation therapy, they were excluded from the study and so sixty patients remained for purposes of analysis. They were categorized from 1 to 4, with 1 being normal and pain-free to 4 meaning non-functional and wheelchair-bound or bedridden.

Post operative radiation was "defined as radiation started within six weeks post operatively." Surgery was either said to have represented a reconstruction of a joint or a fixation of a fracture. The physician researchers analyzed the likelihood of returning to a functional status. Only post operative radiation and pre-fracture functional status were significant in predicting which patients would achieve good function after treatment.

When post operative radiation therapy as well as the type of surgical procedure and method of surgical intervention were analyzed, the authors noted "On multi-variant analysis, only post operative radiation therapy was significant. Fifty three percent of patients having surgery and post operative radiation achieved a good functional status compared to 11.5% of patients having surgery alone."

This is not particularly unexpected since surgery would not alter the biology of the local disease, while radiation likely would kill or deactivate the malignant cells.

The authors noted "The group that received surgery plus radiation therapy had a significantly higher frequency of functional status 1 or 2 for all time periods." The actuarial median survival of those having surgery and radiation was four times as long as the patients having surgery alone.

In conclusion, the authors noted "The group that received surgery plus post-op radiation therapy had a striking survival advantage over the surgery only group." The authors postulated that "another biologically plausible explanation may be that since the patients in the group that received post-operative radiation have a marked improvement in functional status to the extremity, they avoid pneumonia and other terminal illnesses that can affect bedridden patients."

Townsend et al noted "In summary while our data need to be interpreted with caution due to their retrospective nature, it is the only study we are aware of that addresses the impact of many peri-operative factors. We recommend post-operative radiation therapy following stabilization, because our data indicate that it is associated with an increase in functional status, a decrease in second procedures and possibly an increase in overall survival."