Denosumab Reduces Burden of Giant-cell Tumor of the Bone

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- Denosumab decreased tumor presence in the entire cohort.
- Some patients experienced bone regrowth.
- Drug could be first medical alternative to radical surgery.

PHILADELPHIA — Treatment with denosumab, a drug targeted against a protein that helps promote bone destruction, decreased the number of tumor giant cells in patients with giant-cell tumor of the bone, and increased new bone formation, according to the results of a phase II study published in *Clinical Cancer Research*, a journal of the American Association for Cancer Research.

“Giant-cell tumor of the bone is a rare tumor that affects mostly young people,” said Sant P. Chawla, M.D., director of the Santa Monica Oncology Center, Santa Monica, Calif. “Radical surgery is currently the only treatment option. In our study, the use of denosumab allowed patients to avoid radical surgery and prevented recurrence. We hope that in the future, its use may make it possible to avoid surgery completely.”

Giant-cell tumor of the bone is a benign tumor characterized by giant cells that are positive for the protein RANK ligand, which helps promote bone destruction. Currently, the only treatment option for patients with giant-cell tumor of the bone is surgery. However, patients who undergo surgery often have recurrent disease or significant morbidity, such as amputation. In addition, 25 to 30 percent of patients with this tumor have to undergo joint replacements.

Chawla and colleagues conducted this phase II study to explore the mechanism of action of denosumab, an inhibitor of RANK ligand, in the treatment of giant-cell tumor of the bone.

Twenty adult patients with recurrent or unresectable giant-cell tumor of the bone were treated with subcutaneous denosumab every four weeks. After treatment, all 20 of the patients had a decrease in giant cells of 90 percent or greater, an indicator of a reduction of tumor burden. In addition, results indicated that 65 percent of the patients had new bone growth in areas where the RANK ligand had previously caused bone destruction.

“A majority of patients with giant-cell tumor of the bone are young and have to get joint replacements, which last 15 to 20 years before a repeat surgery is needed,” Chawla said. “Now, we hopefully can do minimal surgery, avoiding a joint

replacement and recurrence."

One of the next steps in evaluating denosumab for giant-cell tumor of the bone is a much larger, multinational study that is currently enrolling patients. In addition, Chawla hopes to evaluate the use of denosumab as a presurgery, or neoadjuvant, treatment as well.

"In the future we hope to investigate giving the drug prior to surgery to see the effect it has, then remove the tumor and evaluate the pathological response," Chawla said.

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