

# Effect of Alendronate on Periprosthetic Bone after Total Knee Arthroplasty: A Seven Years Randomized Controlled Trial of 26 Patients

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Kuopion yliopistollinen sairaala

## Background

Total knee arthroplasty (TKA) is known to cause periprosthetic bone loss due to stress shielding, immobilization and intraoperative trauma. This may lead to migration, instability and even aseptic loosening of the prosthetic components. DXA is an accurate and reproducible method used for measuring periprosthetic bone mineral density (BMD). Bisphosphonates are well studied effective inhibitors of bone resorption. We analysed whether one year postoperative treatment with alendronate after TKA would have any clinical efficacy or long term impact on BMD of the periprosthetic bone.

## Methods

Twenty six patients were prospectively randomized into two study groups: alendronate+calcium or calcium only groups (14 and 12 respectively). Several DXA measurements were performed, the first within a week after the operation, 3 months, 6 months, 1, 2, 4, and 7 years postoperatively.

## Results

Alendronate preserved the BMD of the femoral metaphyseal bone during the treatment and the BMD differences between the groups remained significant until 4 years in anterior and 2 years in posterior metaphysis ( $p=0,045$ ,  $p=0,024$ ). Alendronate significantly increased the BMD of the lateral tibial metaphysis up until seven years ( $p=0,002$ ) and the difference between groups was also statistically significant ( $p=0,024$ ).

## Conclusions

Alendronate treatment in the early phase after TKA preserves femoral metaphyseal bone and even increases lateral tibial metaphyseal bone after TKA over the long term. Bisphosphonate treatment in the early phase after TKA may be of benefit e.g. for elderly patients with poor bone quality. However, more studies with a larger number of patients will be needed before one can draw firm conclusions about the clinical benefits of alendronate treatment after TKA.

*Level of evidence: II*