

Impact of Peri-Operative Denosumab on Local Recurrence After Surgical Management of Giant Cell Tumors: A Meta-analysis

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INTRODUCTION:

Several studies have assessed the impact of peri-operative denosumab (DB) on local recurrence after surgical management of giant cell tumor (GCT) with conflicting results. This meta-analysis compares the rates of local recurrence in patients undergoing surgical management for GCT with and without pre-operative DB accounting for the type of surgery, the number of DB doses, and the timing of DB administration.

METHODS:

Following the PRISMA guidelines, PubMed, Cochrane, and Google Scholar (pages 1-20) were accessed and explored until December 2024. The extracted data consisted of local recurrence and DB-related complications. Odds ratio (OR) was utilized for dichotomous data and was calculated across studies.

RESULTS:

Sixteen articles from 15 cohorts were included in the meta-analysis, 1533 patients, with 292 (19%) in the DB group with a mean age of 32 years and a mean follow-up of 40 months and 1241 (81%) in the control group with a mean age of 32 years a mean follow-up of 62 months. Patients in the DB had a statistically significantly higher rate of local recurrence compared to patients in the control group (Odds Ratio=1.82; $p=0.03$), even when looking at studies using curettage as their only surgical management (Odds Ratio=2.75; $p<.001$). When sub-analyzing by the timing of DB administration, the higher rate of local recurrence was only statistically significant among patients receiving DB **both** pre- and post-operatively (Odds Ratio for recurrence relative to control=5.57; $p<.001$). The reported incidence of DB-related complications is 6.5%.

DISCUSSION AND CONCLUSION: In this meta-analysis, patients receiving DB only pre-operatively did not have an increased rate of local recurrence compared to controls. The increased rate of recurrence found in the literature appears to be specifically for patients being treated with pre- and post-operative DB. This may reflect a selection bias for patients with more aggressive disease- suggesting a correlation due to confounding factors, rather than causation between Denosumab and increased rates of recurrence.

