

## The Outcomes and Prognostic Factors of Giant Cell Tumor of the Sacrum

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### Abstract

**Background:** Giant cell tumor (GCT) of the sacrum is a benign aggressive bone tumor with high rate of local recurrence because of the complexity of anatomy and the difficulty of wide excision. Wide excision of GCT of the sacrum can be performed with high possibility of sacral plexus injury postoperatively. Application of local adjuvant with thermal ablation effect during surgery might improve the outcomes of treatment by reduce tumor recurrence with less complication from sacral nerve injury.

**Purposes:** To evaluate the outcomes and prognostic factors in patients with giant cell tumor of the sacrum and to investigate the effectiveness of tumor control and complication between intralesional curettage (IC) versus intralesional curettage with warm saline irrigation (ICW) as the thermal ablation effect.

**Patients and Methods:** A retrospective study of 11 patients with giant cell tumor of the sacrum underwent the treatment at Siriraj Hospital between 2004 -2014. There were 2 males and 9 females with the mean age of 31 years (range, 18-58 years). All were categorized in Campanacci grade 3. Six patients received IC and 7 patients were treated by ICW (50°C warm saline at 30 minutes). Univariate Cox regression analysis was used to assess risk factor of tumor recurrence. Kaplan-Meier analysis was performed to analyze overall survival and 2-year tumor recurrence free survival. Fisher's exact test was used to compare the complication in each surgery.

**Results:** This study revealed tumor involvement at S1 100%, S2 for 91%, S3 for 45% and S4 for 27%. The mean tumor size was 10.7 cm. The most common symptoms were buttock and leg pain. Three patients presented with cauda equina syndrome and 4 patients presented with gross neurological deficit. The median follow-up time was 29 months (range, 10-89 months). Four of 6 patients (67%) developed local recurrence after IC at the median time of 11 months, whereas 3/7 patients (43%) from ICW had local recurrent at the median time of 18

months. Overall survival was 100% and 2-year tumor recurrence free survival was 49%. Univariate statistic analysis demonstrated the result of tumor size  $\geq 10$  cms, 83% had local recurrence. Seven from 11 patients who received pre-operative embolization required average blood transfusion significantly less than non-embolization group (6.5 vs 15 units;  $p = 0.048$ ). Complication occurred in 5/11 patients, two patients (18%) had dural tear and 1 patient (9%) had iatrogenic L5 nerve permanent impairment after surgery. Three patients (27%) developed hemodynamic unstable intra-operation and one patient (9%) had wound complication. Fisher's exact analysis demonstrated no significant difference in complication between IC and ICW group. All patients who presented with cauda equina syndrome had clinical improvement at the median time of 5 months. Three of 4 patients who presented with gross neurological deficit had better function at last follow-up, one patient could ambulate without gait aids and 2 could ambulate with using single cane. Only one patient need wheel chairs for ambulation.

**Conclusion:** In this study, ICW had better outcomes than IC in terms of tumor recurrence control with no additional complication. Preoperative embolization should be considered to reduce blood transfusion during and after surgery.

**Key words:** Giant cell tumor of sacrum, intralesional curettage, warm saline irrigation