

**Introduction:** Modern imaging modalities, including fine cut CT and high-resolution MRI scans, have enhanced the field of orthopaedic oncology. Surgeons are able to accurately define lesions and better identify ideal locations for resections because of these advanced technologies. With the help of these new imaging techniques, surgeons have found success in computer-assisted surgery, which can plan intraoperative osteotomies based on preoperative templates. Intraoperative image guided or navigated systems are commonly used to assist surgeons in identifying the appropriate location of resections and have shown promising results in the literature. However, these intraoperative technologies are not yet widely available and at times can be difficult to use. Computer assisted medical modeling is a method of computer assisted surgery which lets the surgeon create a custom cutting guide based on preoperative imaging, which is used intraoperatively to perform osteotomies for resection. This technique has been used with great success in craniofacial oncology and our department has utilized in orthopaedic oncology for the past three years. Our institution has found the operative technique convenient to plan and user friendly intraoperatively. Here we report our surgical outcomes using computer assisted modeling.

**Methods:** We performed an IRB approved retrospective review of 6 patients treated in our institution requiring oncologic boney resection for sarcoma since 2012. We hypothesized that there was no statistically significant difference between our preoperatively templated boney cuts and postoperatively measured cuts. Our primary outcome was difference between preoperatively templated and postoperative actual resections. Secondary outcomes of interest included status of margins, recurrence of pathology, return to operating room, complications and length of surgery.

**Results:** Our data showed no significant difference between preoperatively templated resections and actual performed resections. Average patient age was 19 years. Four patients received preoperative chemotherapy. All specimens resected had negative tumor margins. Mean length of surgery was 6 hours and 58 minutes and mean length of hospital stay was 10.5 days. Mean blood loss intraoperatively was 960cc. One patient experienced cancer metastasis. One patient required return to operative room and antibiotics for infected allograft nonunion.

**Conclusion:** Because of improved imaging modalities and operative planning technology, computer assisted surgery has gained momentum amongst orthopaedic oncologists for sarcoma resection. Our results show that computer assisted modeling is a precise and accurate technique that can be utilized for oncologic boney resection with similar rates of complications compared to alternative resection techniques.





