

Same Day Surgery Results in Shorter Hospital Stay, Favorable Discharge Disposition, and Less Complications in Patients with Extremity Metastatic Disease

Tom Maarten De Groot¹, Angad Bedi², Jens Pepijn Te Velde², Andreea Renata Lucaciu², Olivier Quinten Groot, Kevin A Raskin³, Santiago Andres Lozano Calderon⁴, Paul C Jutte, Joseph Hasbrouck Schwab⁵

¹Orthopedic Surgery, Massachusetts General Hospital, ²Orthopedic Surgery, ³Mass Gen Hosp, ⁴Orthopedic Surgery, Massachusetts General Hospital - Harvard Medical S, ⁵MGH Dept. of Ortho Surg.

INTRODUCTION:

The prevalence of metastatic bone disease (MBD) is expected to increase due to improvements in diagnosis and medical treatment. Patients with MBD often require surgical intervention due to painful lesions or (impending) pathologic fractures. Many studies confirm a positive effect of earlier surgery on patients with traumatic fractures. However, patients with end-stage cancer often are unstable and could be considered unfit for surgery on first presentation. Additionally, patients sometimes require a metastatic disease work-up before surgery can be considered.

The aim of this study was to evaluate the impact on same day surgery on postoperative outcomes in patients treated surgically for MBD of the extremities.

METHODS: All patients who presented with a pathologic fracture for a metastatic lesion of the long bones between 2016 and 2022 and had at least 30 days follow up were included in the study. Patients who received revision surgery for a metastatic bone lesion, patients who received treatment for a primary bone tumor, and patients who were lost to follow up within 30 days were excluded. The outcomes of interest were long hospital stay, complications in-hospital, and 30-days post follow up and non-home discharge. A prolonged length of stay was defined as a length of stay being above the 75th percentile. Complications that were considered included: in-hospital death; wound dehiscence; wound infection; pneumonia; venous thromboembolism; sepsis; urinary tract infections; transfusions; delirium; and atrial fibrillation. Explanatory variables included demographics, clinical variables, laboratory values, and surgical factors such as surgical subspecialty and whether patients were admitted on weekdays or on the weekends. Multivariate regression analysis was performed to assess the effect of an admission of 24 hours or more before surgery on postoperative outcomes.

RESULTS: In total, 526 patients were included in the study. One-hundred-and-sixty-six patients were treated within 24 hours after admission, and 360 patients were treated after 24 hours (Figure 1). A time from admission to surgery of more than 24 hours was associated with a longer hospital stay (HR 3.14 [95% CI 1.91-5.14]), more complications, both in hospital (HR 2.5 [95% CI 1.54-4.08]) and 30-days post-surgery (HR 2.9 [95%CI 1.65-4.45]). Also, patients were less often discharged to places other than home (HR 3.0 [95%CI 3.0 1.85-4.87])(Table 1).

DISCUSSION AND CONCLUSION: In this study, we evaluated the effect of the time to surgery in patients that present with a symptomatic metastatic lesion of the extremities and its effect on short term postoperative outcomes. Our findings are in concurrence with the existing literature present in trauma surgery research, suggesting that same day surgery of patients with extremity metastases can yield favorable postoperative results.

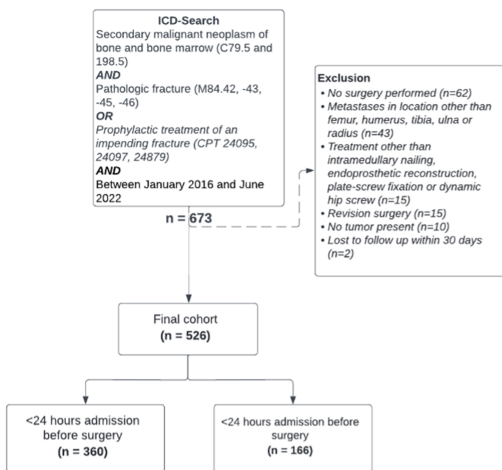


Table 1. Multivariate regression results showing the effect of admission >24 hours before surgery on length of stay, complications, non-home discharge and mortality in patients with metastatic bone disease of the extremities.

Outcome	HR (95% CI)	p-value
Prolonged length of stay*	3.14 (1.91 - 5.14)	<0.01
Complications		
In-hospital	2.5 (1.54 - 4.08)	<0.01
Within 30 days post-surgery	2.9 (1.65 - 4.45)	<0.01
Non-home discharge	3.0 (1.85 - 4.87)	<0.01

HR: Hazard ratio; CI: Confidence interval;

Variables considered in multivariate regression:

- Prolonged length of stay: Male sex, BMI, Eastern Cooperative Oncology Group (ECOG) score, primary tumor, tumor location, pathologic fracture, presence of visceral metastases, presence of brain metastases, preoperative use of targeted therapy, preoperative use of chemotherapy, operation duration, estimated blood loss, anesthesia technique, surgery performed by orthopedic oncologist, >24 hours admitted before surgery, weekend admission.
- Complications in-hospital: BMI, Eastern Cooperative Oncology Group (ECOG) score, primary tumor, surgery performed by orthopedic oncologist, >24 hours admitted before surgery, weekend admission, albumin, hemoglobin, white blood cell count, absolute neutrophil count.
- Complications 30-days post-discharge: BMI, Eastern Cooperative Oncology Group (ECOG) score, pathologic fracture primary tumor, surgery performed by orthopedic oncologist, >24 hours admitted before surgery, weekend admission, albumin, hemoglobin, white blood cell count, absolute neutrophil count.
- Non-home discharge: BMI, Eastern Cooperative Oncology Group (ECOG) score, primary tumor, surgery performed by orthopedic oncologist, >24 hours admitted before surgery, weekend admission, albumin, hemoglobin.

*Prolonged length of stay was defined as patients that had a length of stay higher than the 75th percentile.