

Evaluating standard of care practice patterns for post-operative metastatic bone disease patients

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INTRODUCTION:

Metastatic bone disease (MBD) is a significant contributor to diminished quality of life in cancer patients, often leading to pathologic fractures, hypercalcaemia, intractable bone pain and a reduction in functional independence. Despite the existence of an accepted standard of care for MBD patients undergoing orthopaedic surgery, which recommends bone protective medications, post-operative radiation therapy to the operative site, and regular surgical follow-up, the number of patients in southern Alberta, Canada receiving this standard of care is currently unclear. The aim of this study is to develop a database of all patients in southern Alberta undergoing orthopaedic surgery for MBD disease to evaluate whether patients are routinely treated according to standard of care.

METHODS:

Patients were identified for inclusion in the database by a search query of the Alberta Cancer Registry of all patients with a diagnosis of metastatic cancer who underwent surgery for an impending or actual pathologic fracture in the Calgary, South and Central Alberta Zones. Demographic information, primary cancer history, previous treatments, anatomical location of MBD event(s), surgical fixation techniques, and post-operative care details were collected. The rate of standard of care post-operative treatment was evaluated. A comparison of outcomes between tertiary, urban centres and rural centres was also completed. Survival was calculated from time of first operation to date of death. A univariate and multivariate analyses was performed to identify the impact of post-operative care variables on survival.

RESULTS:

We have identified 558 patients who have undergone surgical treatment for MBD in southern Alberta from 2006-2021. Median age at the time of surgery was 67.3 years and 52.0% of patients were female. Breast, lung, prostate, renal cell and multiple myeloma were the most common primary malignancies (n=461, 82.5%). Regarding post-operative care, 269 patients (40.27%) were treated with post-operative radiotherapy and 357 patients (63.98%) had post-operative surgical follow-up. In urban centers, 76.6% of patients received post-operative surgical follow-up while only 39.6% of rural patients received post-operative surgical follow-up. Only 71 patients (12.7%) received bone protective agents in the peri-operative period. Deep vein thrombosis (DVT) prophylaxis was also analyzed in a modified cohort of 392, a total of 165 (42.1%) of patients received DVT prophylaxis with only 90 (54.5%) receiving DVT prophylaxis for at least 30 days. Patients were treated at nine hospitals across southern Alberta with most patients treated in an urban center (65.6%). Post-operative survival was significantly longer amongst patients treated in an urban center (8.9 months, 95%CI: 7.1-11.2 versus 5.0 months, 95%CI: 3.88-6.21, p<0.001).

DISCUSSION AND CONCLUSION:

The burden of MBD is significant and increasing. As patients are treated at centers across the province, there is a need for standardized peri- and post-operative protocols to improve patient care. To provide evidence informed treatment recommendations, we have developed a database of all patients in southern Alberta undergoing orthopaedic surgery for MBD. Our results demonstrate that many patients were not treated according to post-operative standard of care guidelines. Most notably, 36% of the included patients did not see their surgeon for post-operative follow-up and only 42.1% of patients received DVT prophylaxis. The development of this database is an integral step towards improving outcomes for patients undergoing MBD surgery.