

What is the Value of undergoing Surgery for Spinal Metastases at Dedicated Cancer Centers?



Azeem Tariq Malik, MBBS, Safdar N Khan, MD, Ryan T. Voskuil, MD, John H Alexander, MD, Joseph P Drain, MD, Thomas J Scharschmidt, MD

Department of Orthopaedics, The Ohio State University Wexner Medical Center

Introduction

The Alliance of Dedicated Cancer Centers is a organization of 11 leading cancer institutions/affiliated hospitals that are exempt from the Medicare prospective system (PPS) hospital reimbursement policies. Because of their focus on cancer care, as well as participation in innovative cancer treatment methods/protocols, these hospitals are largely reimbursed based on their actual billings. Due to the lack of incentive to meet a pre-determined target price and/or reduce costs, recent critics have often questioned the value of cancer care at these institutions.

Questions

The current study aims to evaluate where there are differences in 90-day outcomes for patients undergoing surgical treatment (decompression or fusion) for spinal metastases at dedicated cancer centers (DCC) versus other non-DCC hospitals.

Materials and Methods

- **2005-2014 100% Medicare Standard Analytical Files (SAF100)**
- Patients undergoing decompression or fusion for spinal metastases.
- Medicare hospital provider IDs/CCNs were used to identify the 11 DCC hospitals.
- Multi-variate logistic regression analyses were used to compare rates of 90-day complications and 90-day mortality between DCC and Non-DCC hospitals, while controlling for baseline clinical characteristics, procedural factors and hospital-level factors. Generalized linear regression modeling was used to evaluate differences in total 90-day costs between DCC and Non-DCCs.

Results

- A total of 17,776 patients were included – **out of 1,138 (6.4%) underwent management at one of the 11 DCC hospitals.**
- DCCs were more likely to treat patients with spinal metastases due to renal cancers, slightly higher co-morbidity burden and those with a median household income below the national quintile.
- DCCs were also more likely to treat patients with either fusion or decompression and fusion, as compared to decompression alone.
- DCCs also were more likely to do longer fusions, and treat patients with post-operative radiation and chemotherapy.

Table 1: Multi-variate analysis showing differences in 90-day Outcomes between DCCs and Non-DCCs..

	DCC (N=1,138)	Non-DCC (N=16,638)	Adjusted OR [95% CI]	P-value
Wound complications	123 (10.8%)	1,415 (8.5%)	1.01 [0.79-1.28]	0.940
Cardiac complications	191 (16.8%)	2,808 (16.9%)	1.07 [0.87-1.31]	0.508
Thromboembolic complications	115 (10.1%)	1,534 (9.2%)	0.95 [0.75-1.21]	0.693
Sepsis	74 (6.5%)	1,648 (9.9%)	0.55 [0.42-0.73]	<0.001
Pneumonia	176 (15.5%)	2,643 (15.9%)	0.87 [0.71-1.06]	0.161
Urinary tract infection	220 (19.3%)	4,600 (27.6%)	0.58 [0.48-0.69]	<0.001
Renal complications	102 (9.0%)	2,183 (13.1%)	0.56 [0.44-0.72]	<0.001
ED visits	307 (26.9%)	5,165 (31.0%)	0.76 [0.65-0.90]	0.001
Implant-related complications	58 (5.1%)	635 (3.8%)	1.12 [0.80-1.57]	0.497
Revision surgery	21 (1.8%)	314 (1.9%)	0.78 [0.45-1.30]	0.354
Readmissions	423 (37.2%)	5,566 (33.5%)	0.89 [0.76-1.04]	0.132
Mortality	442 (38.8%)	8,177 (49.1%)	0.71 [0.61-0.83]	<0.001

Patients undergoing surgery at DCC (vs. a non-DCC) had a significantly lower risk of experiencing

- **Sepsis** (6.5% vs. 9.9%; OR 0.55, p<0.001)
 - **Urinary tract infections** (19.3% vs. 27.6%; OR 0.58, p<0.001)
 - **Renal complications** (9.0% vs. 13.1%; OR 0.56, p<0.001)
 - **Emergency department visits** (26.9% vs. 31.0%; OR 0.76, p=0.001)
 - **Mortality** (38.8% vs. 49.1%; OR 0.71, p<0.001)
- Undergoing surgery at a DCC was **also associated with significantly reduced 90-day risk adjusted costs (-\$15,103; p<0.001)**, as compared to non-DCCs.

Conclusions

- Based on our findings, it appears that DCCs offer high-value care, as evidenced by lower complication rates and reduced costs, following surgery for spinal metastases. Further study is required to better understand the processes of care adopted at these institutions, so that additional cancer centers may also be able to deliver high-value care.