Corpectomy and Vertebral Body Reconstruction with Expandable Cage Placement and Osteosynthesis via the single stage Posterior Approach: a Retrospective Series of 34 Patients with Thoracic and Lumbar Spine Vertebral Body Tumors

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BACKGROUND: **Metastatic disease of the spine requires a multidisciplinary and comprehensive approach to patient care, especially, for patients in a lot of pain with neurological deficit or spinal instability requiring surgical stabilization.**

OBJECTIVES: **The purpose of the study is to report our experience on 34 patients who underwent spinal metastasis resection. We used a single-stage posterior approach with vertebral body reconstruction by an expandable titanium cage and a posterior instrumentation. The parameters assessed were neurologic status, OMS score, angle of sagittal deformity, and morbidity.**

METHODS: **Between January 2011 and June 2014 we performed a monocentric consecutive case review of 34 patients with vertebral body tumor. All of them underwent a single-stage vertebrectomy with circumferential reconstruction and an arthrodesis by posterior approach.**

RESULTS: **34 patients underwent a single stage surgery by posterior approach, including 30 thoracic lesions and 4 lumbar lesions. Pre operatively, sixteen patients presented a neurologic impairment. The mean follow-up was 13.7 months [1-32m]. No neurologic impairment was observed in the 34 cases. At the last term of follow-up, neurologic status was improved in 23 cases. OMS score was improved in 23 cases (67.6 %), and worsened in one case. Before surgery, the average of visual analogic scale was 8.94/10 [7-10] and decreased to 2.62/10 [1-5] after surgery. Single posterior approach surgery significantly reduced the average sagittal deformity to 10.0° (0.01–19.96; $P = 0.013$, Mann-Whitney test).**

CONCLUSION: **Our outcomes suggest that it will be more efficient to perform an aggressive approach in spinal metastatic treatment in order to improve quality of life.**

INTRODUCTION

Metastatic disease of the spine has become the most common spine tumor and occurs more frequently than primary bone malignancies, especially among people older than 40 years of age (8). Management of these patients requires a multidisciplinary and comprehensive approach to patient care. In particular, patients with intractable pain, brutal or progressive neurologic deficits, or spinal instabilities require surgical stabilization (18). Accordingly, performance of tumor resection and spinal cord decompression requires definition of appropriate surgical approaches to optimize resections, spinal stabilization, and morbidity, and posterior-only approaches may be preferred over anterior approaches, especially for tumors of the thoracic spine (1, 26).

In the present study, we report our experience with 34 patients from whom spinal metastases were resected using a single-stage posterior approach with vertebral body reconstruction, an expandable titanium cage, and posterior instrumentation. Assessed parameters included neurologic statuses, ocular motor scores (OMSs), visual analog scales, angles of sagittal deformity, fusion rates, and morbidity rates.

Key words
- Corpectomy
- Expandable cage
- OMS status
- Single stage posterior approach
- Spinal metastasis

Abbreviations and Acronyms
ASIA: American Spinal Injury Association
CT: Computed tomography
OMS: Organisation Mondiale de la santé
WHO: World Health Organization

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Table 1. Preoperative and Postoperative Patient Data for 34 Consecutive Single-Stage Corpectomy Patients

Patient	Sex	Age	Level	Other Spinal Metastasis	Other Metastasis	Previous Lesion	Tumor	VB Involvement	Pedicle Involvement	Number of VB Involved	Instrumentation	Levels of Posterior Instrumentation	Columun Attempt (Kostuik et al.)	Preoperative OMS Score	Postoperative OMS Score
1	M	75	T6	0	Brain	No	Renal cell tumor	AR, MR	R	1	+2/−2	T4T5-T7T8	3	2	2
2	M	75	T8	0	Sacrum	No	Renal cell tumor	AL, ML	L	1	+2/¯2	T6T7-T9T10	3	3	2
3	M	71	T7	T12, L4	Rib	Yes	Lung	AR, MR	R, R−1	1	+2/−2	T5T6-T9T10	3	2	2
4	M	65	T7	0	Local adp	Yes	Lung	AR, MR, AL, ML	R	1	+2/−2	T5T6-T8T9	4	3	2
5	M	39	L2	0	0	No	Renal cell tumor	AR, MR	R	1	+2/−2	T12L1-L3L4	3	3	3
6	F	58	T12	0	0	No	Breast	AR, MR, AL, ML	R, L	1	+2/−2	T10T11-L1L2	6	3	2
7	M	75	T9	0	0	Yes	Lung	AR, MR, AL, ML	R, L	1	+3/−2	T6T7T8-T10T11	6	4	3
8	M	59	T6 T7	0	0	No	Renal cell tumor	AR, MR, AL, ML	R, L	2	+3/−3	T3T4T5-T8T9T10	6; 4	4	3
9	F	63	L1	0	0	Yes	Malignant angioma	AR, MR, ML	R	1	+2/−2	T11T12-L2L3	4	3	3
10	F	43	T9	Pedicle L5	0	No	Breast	AR, MR, AL, ML	R	1	+2/−2	T6T7-T10T11	5	2	1
11	M	63	L3	0	0	No	Esophagus	AR, MR, AL, ML	R, L	1	+2/−2	L1L2-L4L5	6	4	3
12	M	41	T4	0	0	No	Sarcoma	AR, MR, AL, ML	R, L	1	+2/−2	T2T3-T6T7	6	3	0
13	M	65	T4	0	0	Yes	Myeloma	AR, MR, AL, ML	-	1	+2/−3	T2T3-T6T7T8	4	2	0
14	M	79	T9	S1	0	No	Thyroïd	MR, ML	L	1	+2/−2	T6T7-T11T12	3	4	4
15	M	47	T5 T6	0	Adjacent rib	Yes	Lung	AR, MR, AL, ML AR-1, MR-1	R, R−1	2	+3/−3	T2T3T4-T7T8T9	5; 3	3	1
16	M	71	T7	0	0	Yes	Lung	AR, MR, AL, ML	R, L	1	+2/−2	T5T6-T8T9	6	4	1
17	F	65	T7	0	0	Yes	Plasmacytoma	AR, MR, AL, ML	R	1	+2/−2	T5T6-T9T10	5	4	4

VB, vertebral body; OMS, ocular motor score; AR, anterior right; MR, middle right; AL, anterior left; ML, middle left; adp, adenopathy; PL, posterior left; PR, posterior right.

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