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Perioperative complications and prognosis of total en bloc spondylectomy for spinal metastases in elderly patients

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Background

- ✓ Only few studies have focused on the surgical results of total en bloc spondylectomy (TES) in elderly patients with metastatic spinal disease.

Liu P, et al. Clin Neurol Neurosurg 2018 170:20-26

Murakami H, et al. Orthopedics 2015 Volume33 Issue3

Yokogawa N, Murakami H, et al. Orthopedics 2015 38: e561-6

Purpose

- ✓ This study aimed to evaluate the perioperative complications and prognosis in TES for metastatic spinal disease in elderly patients.



Methods

✓ Retrospective Study

87 patients (94 Total en bloc spondylectomy: TES)
between 2010 and 2015

7 patients underwent TES twice for spinal metastases at different levels and times.

Group 1 (**27** elderly patients, ≥65 years old)

Group 2 (**60** nonelderly patients, <65 years old)

- ✓ Overall survival (OS) after TES (Kaplan-Meier method)
- ✓ Perioperative complication rate
- ✓ Preoperative/postoperative Frankel scores
- ✓ OS between subgroup 1 and subgroup 2
 - subgroup 1 (renal cell, thyroid, and breast cancer metastasis)
 - subgroup 1 (other primary tumors)



■ Patient characteristics

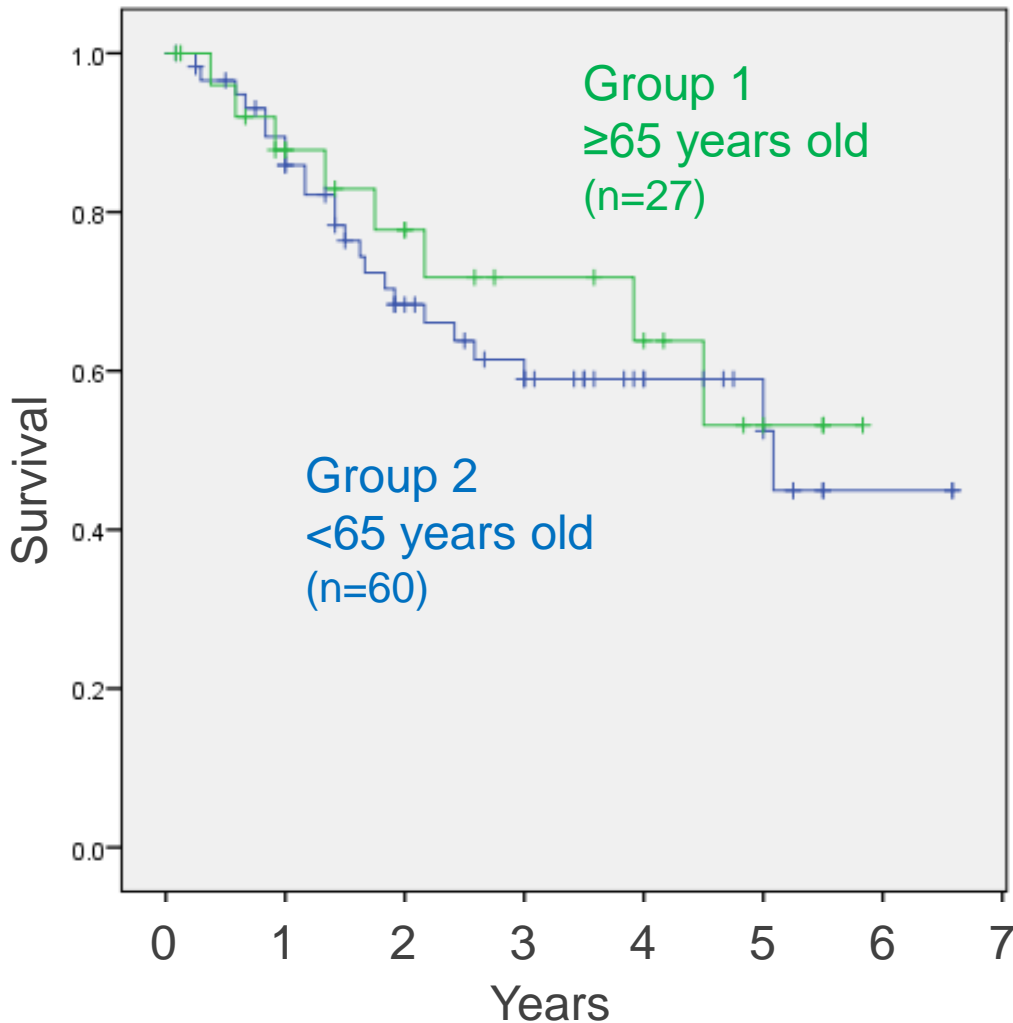
	≥65 years old (n=27)	<65 years old (n=60)	P
Gender (Male : Female)	13:14	37:23	0.25
Body mass index	22.7 ± 2.4	23.7 ± 3.2	0.15
Smoking status	6	19	0.45
American society of anesthesiologists grade	PS3 : 7 pts. PS2 : 21pts.	PS3 : 11 pts. PS2 : 55 pts.	0.40
Preoperative Frankel scores	E:16, D:2, C:8 B:0, A:2	E:41, D8, C14 B:2, A1	0.91
%VC	104.4 ± 15.4	109.4 ± 18.4	0.11
Diabetes	7	9	0.24
history of preoperative radiation therapy	12	22	0.64

Patient characteristics

	≥65 years old (n=27)	<65 years old (n=60)	P
Tumor location	Thoracic :23 Lumbar: 5	Thoracic :50 Lumbar: 16	0.60
Number of resected vertebrae	3 vertebra: 8 2 vertebra: 8 1 vertebra: 12	3 vertebra: 14 2 vertebra: 10 1 vertebra: 42	0.28
Primary tumor	Kidney: 9 Thyroid: 5 Breast: 5 Other organ: 8	Kidney: 14 Thyroid: 4 Breast: 9 Other organ: 33	0.27
Organ metastasis	12	26	0.82
Other bone metastasis	10	32	0.36
Operative time (min)	489 ± 147	466 ± 130	0.98
intraoperative bleeding	777 ± 736 ml	569 ± 745 ml	0.19

✓ Mann–Whitney Utests, Pearson’s chi-square, Fisher’s exact tests

Results



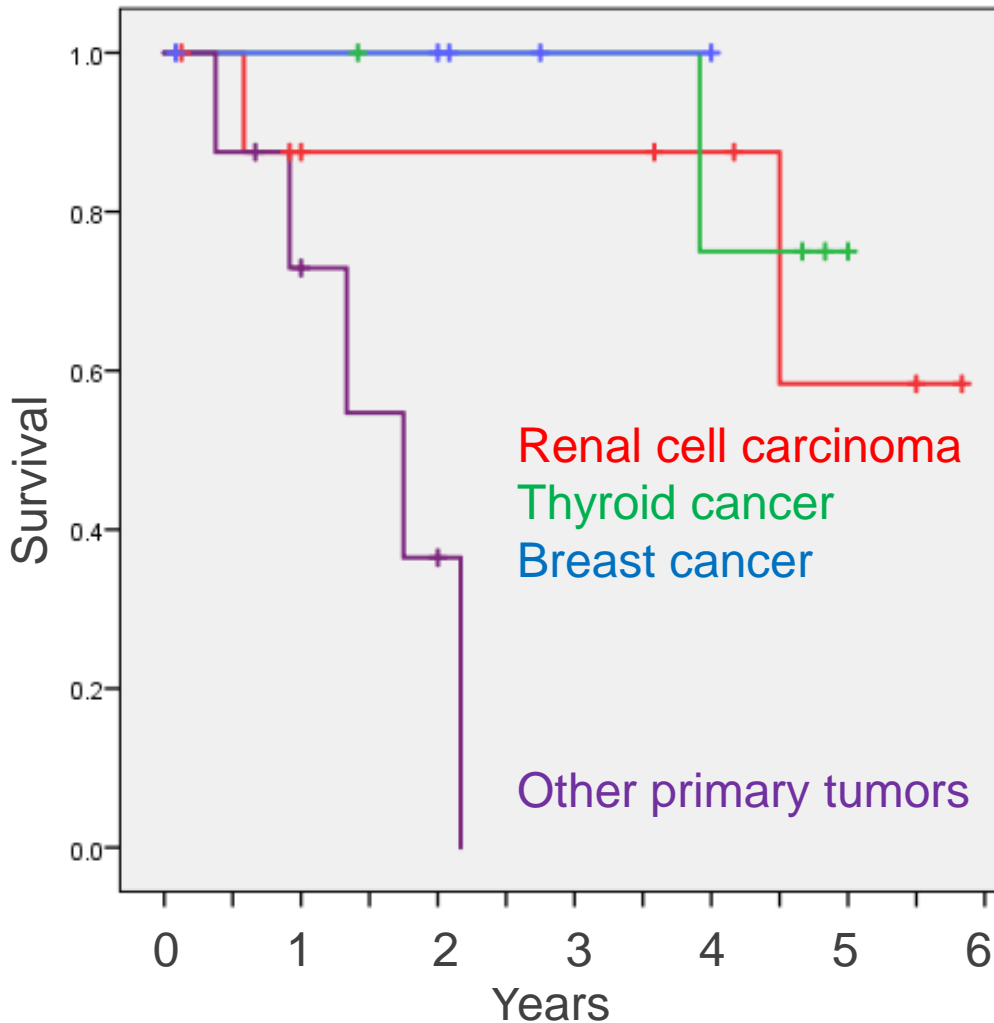
The mean follow-up of the 87 patients was 30.8 months (1 to 79)

The OS at 1, 2, 3, and 5 years
88%, 78%, 72%, and 53% (group 1)
86%, 68%, 59%, and 52% (group 2)

No significant difference in OS was observed between the two groups. (p=0.61, Log-rank test)



Results



In group 1 (≥ 65 years old), we evaluated OS between subgroup 1 and subgroup 2

subgroup 1: **Renal cell carcinoma**
Thyroid cancer
Breast cancer

subgroup 2: **Other primary tumors**

The OS at 1, 2, 3, and 5 years
94%, 94%, 94%, 70% (subgroup 1)
73%, 37%, 0%, 0% (subgroup 2)

A significant difference in OS was found between subgroups 1 and 2 ($p < 0.01$).



Perioperative complications

	≥65 years old (n=27)	<65 years old (n=60)	P
Pleural effusions Requiring thoracentesis or thoracic cavity drainage	6 pts. (26%)	7 pts. (14%)	0.32
Proximal DVT or PE	3 pts. (11%)	3 pts. (4.5%)	0.35
Intraoperative dural injury	8 pts. (29%)	11 pts. (17%)	0.26
Intraoperative pleural injury	6 pts. (23%)	12 pts. (24%)	0.77
Postoperative delirium	3 pts. (11%)	1 pts. (1.5%)	0.08
Surgical site infection	0 pts. (0%)	2 pts. (3%)	0.35
Reoperation due to cerebrospinal fluid leakage, wound dehiscence	4 pts. (14%)	4 pts. (6%)	0.23
Pneumocephalus due to postoperative cerebrospinal fluid leakage	1 pts. (3.6%)	0 pts. (3.0%)	0.89
Intracranial subdural hematoma due to postoperative cerebrospinal fluid leakage	0 pts. (0%)	2 pts. (3%)	0.35
Cerebellar hemorrhage due to low cerebrospinal fluid pressure	1 pts. (3.6%)	0 pts. (0%)	0.29

✓ Mann–Whitney Utests, Pearson’s chi-square, Fisher’s exact tests

Pre- and postoperative Frankel scores (≥65 y.o.)

		Frankel score at final follow-up				
		A	B	C	D	E
Preoperative Frankel score	A	2				
	B					
	C	1 [†]		3	2	2
	D				1	1
	E			2 [*]	4	9

22 patients (**88%**) maintained or regained their ambulatory capacity at the final follow-up.

- ◆ In one case[†], neurological function deteriorated immediately after surgery.
- ◆ In two cases^{*}, neurological function deteriorated 3 years after surgery due to tumor recurrence at adjacent vertebra.

Discussion

- TES provided favorable maintenance of ambulation capacity and local control of spinal metastases, during a patient's lifetime.

Postoperative ambulation were associated with longer survival after surgery for metastatic spinal tumor.

Hirabayashi H, et al. Cancer 2003 97: 476-484

Local recurrence after palliative surgery for spinal metastasis

Renal cell carcinoma metastasis: 15%-48%

Thyroid cancer metastasis: 57%

King GJ, et al. Spine 1991 16: 265-271

Tatsui C, et al. Journal of Neurosurgery Spine 2014 20: 108-16

Demura S, et al. Journal of Neurosurgery Spine 2011 14: 172-176.

TES can provide favorable prognosis, especially in those with spinal metastasis of renal cell carcinoma and thyroid carcinoma

Discussion

- Elderly patients who underwent TES tended to have more-frequent perioperative complications than nonelderly patients, although the difference was not statistically significant.

Perioperative complications

	≥65 years old (n=27)	<65 years old (n=60)	P
Pleural effusions <small>Requiring thoracentesis or thoracic cavity drainage</small>	6 pts. (26%)	7 pts. (14%)	0.32
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✓ Mann-Whitney Utests, Pearson's chi-square, Fisher's exact tests

Conclusions

- Even in patients with advanced age, TES provided favorable local control for spinal metastases during the patients' lifetimes, especially in those with spinal metastasis of renal cell carcinoma, thyroid carcinoma, and breast cancer.
- Elderly patients who underwent TES tended to have more-frequent perioperative complications than nonelderly patients.

Disclosure

I have nothing to disclose.

