



Survival and Clinical Outcomes in Patients with Metastatic Epidural Spinal Cord Compression: Results from the AOSpine Prospective Multi-Centre Study of 142 patients

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Introduction

Metastatic Epidural Spinal Cord Compression (MESCC) affects 2.5 to 10% of cancer patients. The impact of surgery on Health Related Quality of Life (HRQoL) is not well established. This study prospectively evaluated survival as well as neurological, functional, and HRQoL outcomes in MESCC patients undergoing operative management.

Methods

142 surgically treated patients with a single symptomatic MESCC lesion were enrolled in a prospective North American multi-center study and followed for at least 12 months. Clinical outcomes including Brief Pain Inventory (BPI), ASIA Impairment Scale (AIS), SF-36, Oswestry Disability Index (ODI), and EQ-5D scores, were obtained both pre-operatively and 6 weeks and 3, 6, 9 and 12 months.

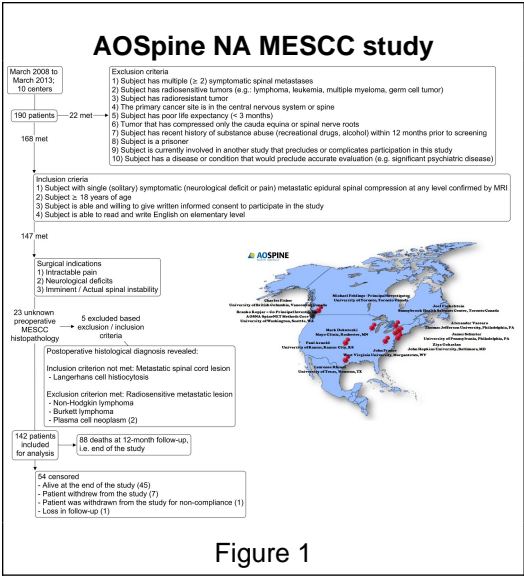


Figure 1

Results

The median survival was 7.7 months. The 30-day and 12-month mortality rates were 9% and 62%, respectively. There was improvement (a) at 6 months post-operatively for ambulatory status (McNemar's test, $p < 0.0013$), lower extremity and total motor scores (Wilcoxon Signed Rank Test, $p < 0.0019$ and 0.0007 , respectively), and (b) at 6 weeks, 3, 6, and 12 months for ODI, EQ-5D, and pain interference (paired t test, $p < 0.0125$). Moreover, at 3 months after surgery the AIS grade was improved (Stuart-Maxwell test $p = 0.0041$). SF-36 scores improved post-operatively in 6 out of 8 domains. Ten patients had wound complications (10.4%) and 2 patients (1.41%) required a second surgery (screw malposition and epidural hematoma).

Patient characteristics			
Variable	Value	n	(142)
Age, mean years (SD; median; range)	59.4 (11.97; 59.5; 29 – 85)	142	
Female	59 (42%)	142	
Comorbidities	108 (76%)	142	
Site of primary tumor		142	
Lungs	34 (24%)		
Kidney	22 (16%)		
Breast	21 (15%)		
Prostate	19 (14%)		
Gastrointestinal	10 (7%)		
Unknown	13 (9%)		
Other	21 (15%)		
Other metastasis located outside the spine	88 (61%)	142	
Bone metastases	18 (21%)	88	
Visceral metastases	44 (51%)	88	
Both bone and visceral metastases	24 (28%)	88	
Number of vertebral body involved		142	
1	99 (70%)		
2	17 (12%)		
3	19 (13%)		
> 4	7 (5%)		
Ability to walk 4 steps independently	102 (72%)	142	
Bladder / Bowel dysfunction	24 (17%) 17 (12%)	141	
Principal indication for surgical procedure		142	
Intractable pain	55 (39%)		
Neurological deficits	57 (40%)		
Instability / Imminent instability	30 (21%)		
Number level operated on, mean (SD; median; range)	5.3 (2.56; 5; 1 – 18)	142	
Surgical procedures		142	
Anterior decompression and reconstruction only	10 (7%)		
Posterior approach only	83 (58%)		
Combined anterior and posterior approach	49 (35%)		
Spinal device used	134 (94%)	142	
Plates	19		
Pedicle screws	124		
Rods	110		
Cage	36		
Other spine device	22		
Mean operative time from opening to closure in minutes (SD; median; range)	291.44 (272.0; 148.16; 80 – 1065)	142	

Table 1

Scores by follow-up visit				
Follow-up	n	Mean pre-operative score (SD)	Mean post-operative score (SD)	p-value
ISNCSCI Motor score upper extremities				
6 weeks	73	48.63 (4.01)	48.82 (4.45)	0.9507 ^a
3 months	56	48.61 (4.73)	49.20 (3.54)	0.5811 ^a
6 months	45	48.56 (4.89)	49.64 (1.72)	0.2266 ^a
12 months	22	47.05 (7.05)	49.91 (0.43)	0.0625 ^a
ISNCSCI Motor score lower extremities				
6 weeks	71	44.75 (10.28)	47.01 (7.91)	0.0158 ^a
3 months	55	45.04 (10.18)	48.51 (7.00)	0.0038 ^a
6 months	44	45.34 (9.55)	49.45 (1.80)	0.0019 ^a
12 months	22	45.41 (7.71)	50.00 (0)	0.0078 ^a
ISNCSCI Motor score total				
6 weeks	71	93.37 (11.85)	95.80 (10.77)	0.0420 ^a
3 months	55	93.65 (12.08)	97.69 (8.48)	0.0133 ^a
6 months	44	93.91 (12.03)	99.23 (3.15)	0.0007 ^a
12 months	22	92.45 (12.96)	99.91 (0.43)	0.0020 ^a
BPI - Pain severity				
6 weeks	94	6.41 (2.68)	4.39 (2.38)	<0.0001*
3 months	69	6.49 (2.76)	4.07 (2.47)	<0.0001*
6 months	46	6.64 (2.57)	4.32 (2.68)	<0.0001*
12 months	17	5.62 (2.82)	3.06 (1.97)	0.0192*
BPI - Pain interference				
6 weeks	94	7.16 (2.63)	4.82 (2.46)	<0.0001*
3 months	69	7.05 (2.69)	4.13 (2.56)	<0.0001*
6 months	46	6.83 (2.47)	4.18 (2.68)	<0.0001*
12 months	17	6.70 (2.42)	3.82 (2.61)	0.0089*
ODI				
6 weeks	73	54.10 (21.74)	46.34 (19.45)	0.0016*
3 months	58	52.55 (21.46)	35.40 (19.79)	<0.0001*
6 months	43	54.47 (21.12)	29.37 (15.88)	<0.0001*
12 months	33	48.79 (21.00)	33.09 (19.83)	0.0014*
EQ-5D				
6 weeks	74	0.44 (0.26)	0.57 (0.24)	<0.0001*
3 months	59	0.49 (0.27)	0.67 (0.20)	<0.0001*
6 months	46	0.50 (0.26)	0.74 (0.15)	<0.0001*
12 months	34	0.52 (0.26)	0.68 (0.22)	0.0061*
SF-36 - Physical Component t-score (PCS)				
6 weeks	74	30.69 (9.74)	27.91 (13.44)	0.0158*
3 months	61	31.66 (9.73)	32.21 (9.68)	0.7133*
6 months	47	32.31 (8.74)	33.37 (11.22)	0.5961*
12 months	34	35.89 (8.97)	35.60 (11.09)	0.4168*
SF-36 - Mental Component t-score (MCS)				
6 weeks	74	43.71 (11.21)	45.72 (12.52)	0.2467*
3 months	61	44.55 (11.37)	47.86 (11.18)	0.0511*
6 months	47	43.44 (10.60)	50.77 (11.10)	0.0006*
12 months	34	43.83 (11.58)	47.89 (13.21)	0.1237*
SF-36 - Physical Functioning t-score				
6 weeks	75	30.68 (13.73)	26.62 (10.23)	0.0203*
3 months	61	31.53 (14.58)	31.12 (10.73)	0.8351*
6 months	47	31.96 (14.96)	34.84 (12.54)	0.3227*
12 months	34	34.44 (15.28)	35.43 (13.38)	0.7602*
SF-36 - Bodily Pain t-score				
6 weeks	75	29.92 (8.02)	36.61 (8.59)	<0.0001*
3 months	61	30.17 (8.06)	40.08 (10.32)	<0.0001*
6 months	48	30.76 (7.00)	41.59 (10.65)	<0.0001*
12 months	34	31.53 (7.85)	40.22 (12.02)	0.0005*
SF-36 - General Health t-score				
6 weeks	75	43.56 (10.22)	40.09 (10.59)	0.0075*
3 months	61	45.63 (9.16)	41.13 (11.00)	0.0044*
6 months	48	45.36 (9.81)	40.25 (11.13)	0.0026*
12 months	34	46.55 (9.65)	42.95 (12.27)	0.0937*

Table 2

ISNCSCI: International Standards For Neurological Classification Of Spinal Cord Injury; **BPI:** Brief Pain Inventory; **ODI:** Oswestry Disability Index

& Wilcoxon Signed Rank Test

* Paired t-test

Scores by follow-up visit (cont'd)				
SF-36 - Energy / Fatigue t-score				
6 weeks	74	43.23 (10.93)	41.92 (10.14)	0.3977*
3 months	61	44.36 (10.64)	44.82 (9.22)	0.8047*
6 months	48	44.81 (9.05)	45.78 (10.67)	0.5462*
12 months	34	46.86 (9.74)	46.86 (11.34)	1.0000*
SF-36 - Social Functioning t-score				
6 weeks	75	31.40 (12.43)	30.31 (13.00)	0.5380*
3 months	61	31.90 (12.92)	36.20 (11.70)	0.0190*
6 months	48	32.31 (12.58)	40.37 (12.04)	0.0002*
12 months	34	31.18 (11.36)	37.76 (12.90)	0.0240*
SF-36 - Role Limitations Due to Physical Problems t-score				
6 weeks	75	30.04 (10.55)	25.70 (9.09)	0.0039*
3 months	61	31.24 (10.24)	31.24 (10.70)	1.0000*
6 months	47	30.96 (9.89)	33.58 (12.02)	0.2055*
12 months	34	31.64 (10.79)	34.93 (12.69)	0.1680*
SF-36 - Role Limitations Due to Emotional Problems t-score				
6 weeks	75	37.01 (15.99)	38.15 (16.11)	0.6340*
3 months	61	39.37 (15.07)	40.39 (15.28)	0.6309*
6 months	47	37.60 (15.46)	45.13 (13.66)	0.0102*
12 months	34	37.70 (17.27)	40.90 (16.27)	0.3227*
SF-36 - Emotional Well-Being t-score				
6 weeks	74	43.54 (9.93)	46.29 (11.43)	0.0622*
3 months	61	43.41 (10.23)	48.35 (9.53)	0.0028*
6 months	48	43.08 (10.23)	50.30 (10.95)	0.0004*
12 months	34	44.38 (10.58)	49.18 (12.26)	0.0462*

Table 2

Conclusions

Surgical intervention, as a complementary adjunct to radiation and chemotherapy, provides immediate and sustained improvement in pain, neurological, functional, and QoL outcomes with acceptable risks in patients with a focal symptomatic MESCC lesion.

References

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