

# Cervical spine surgery for Spondylitic Myelopathy: Ventral vs. Dorsal approach

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4 Year program

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**Sackler Faculty of Medicine**  
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**פרויקט ח"ץ Arrow Project**

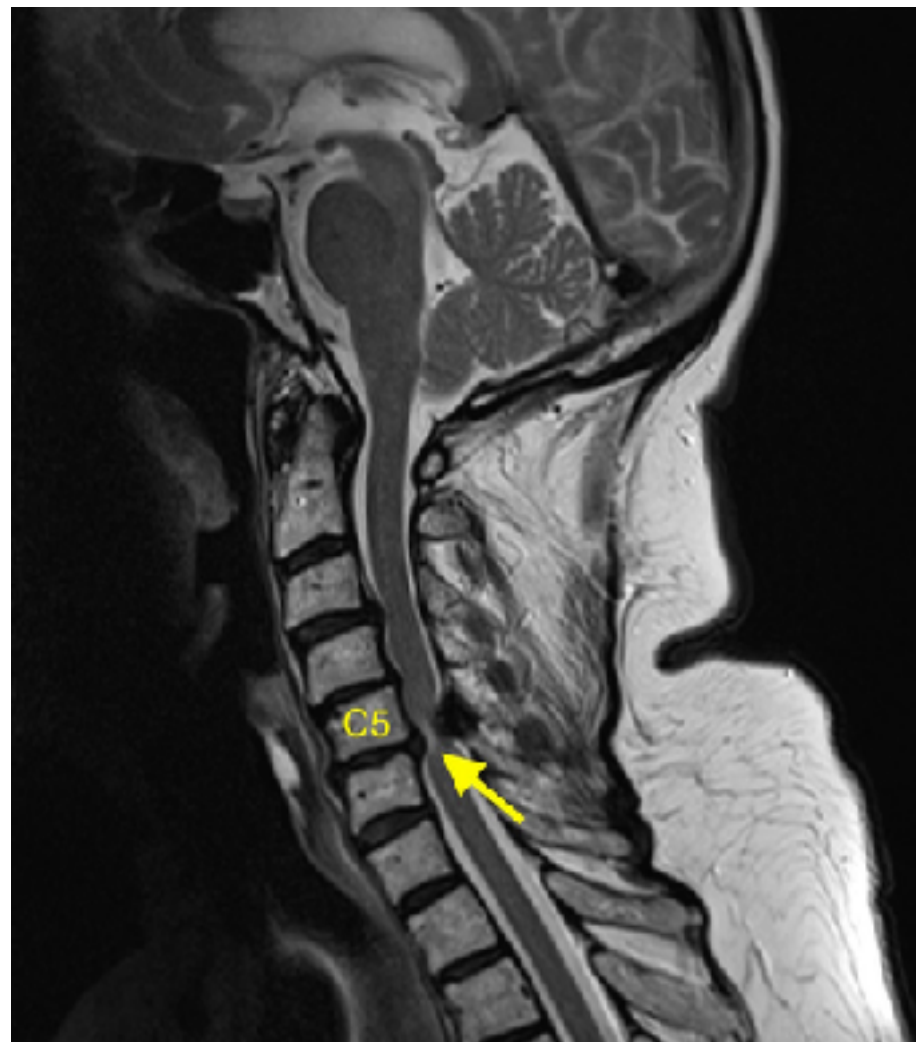


שיבא - מרכז רפואי אקדמי מצטיין

# Background

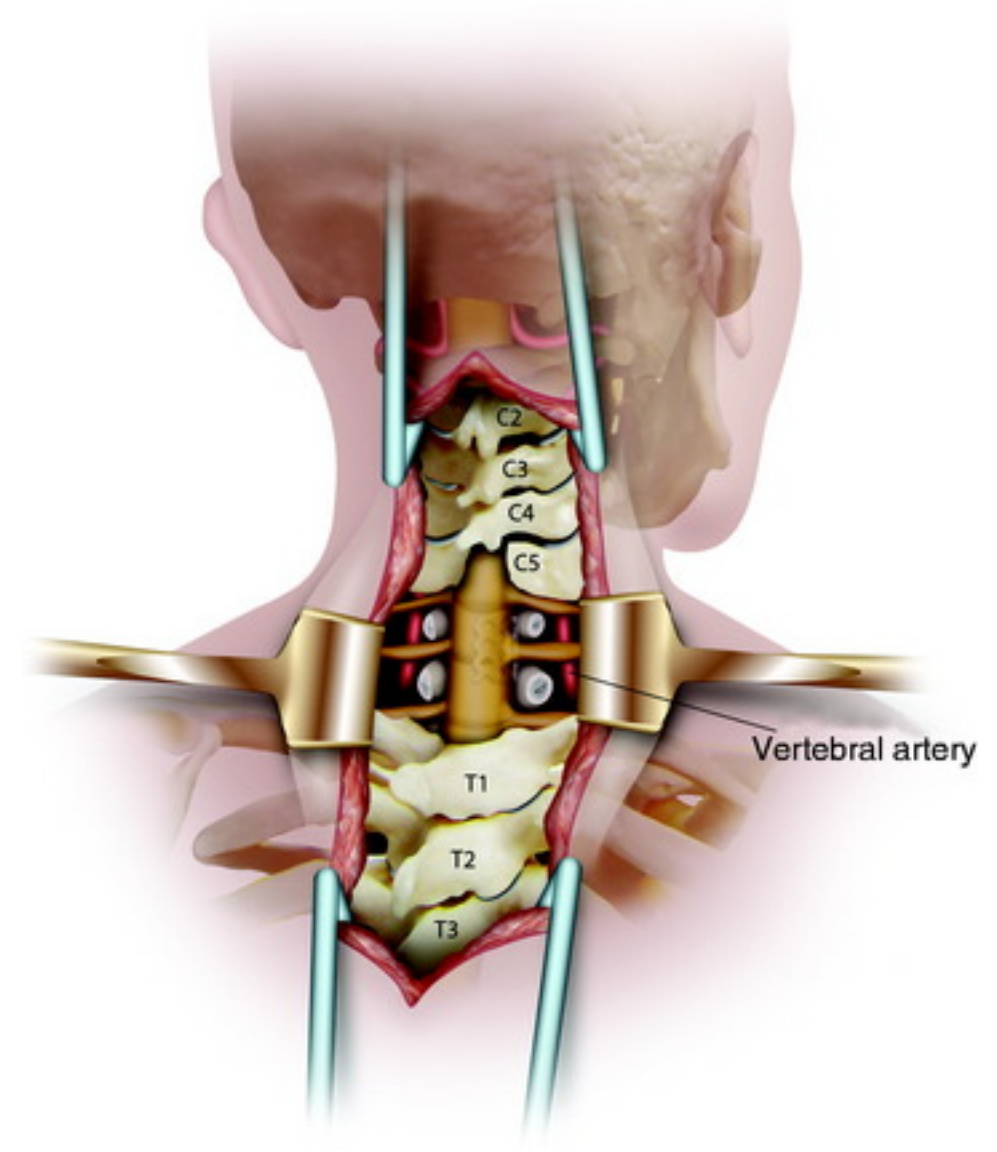
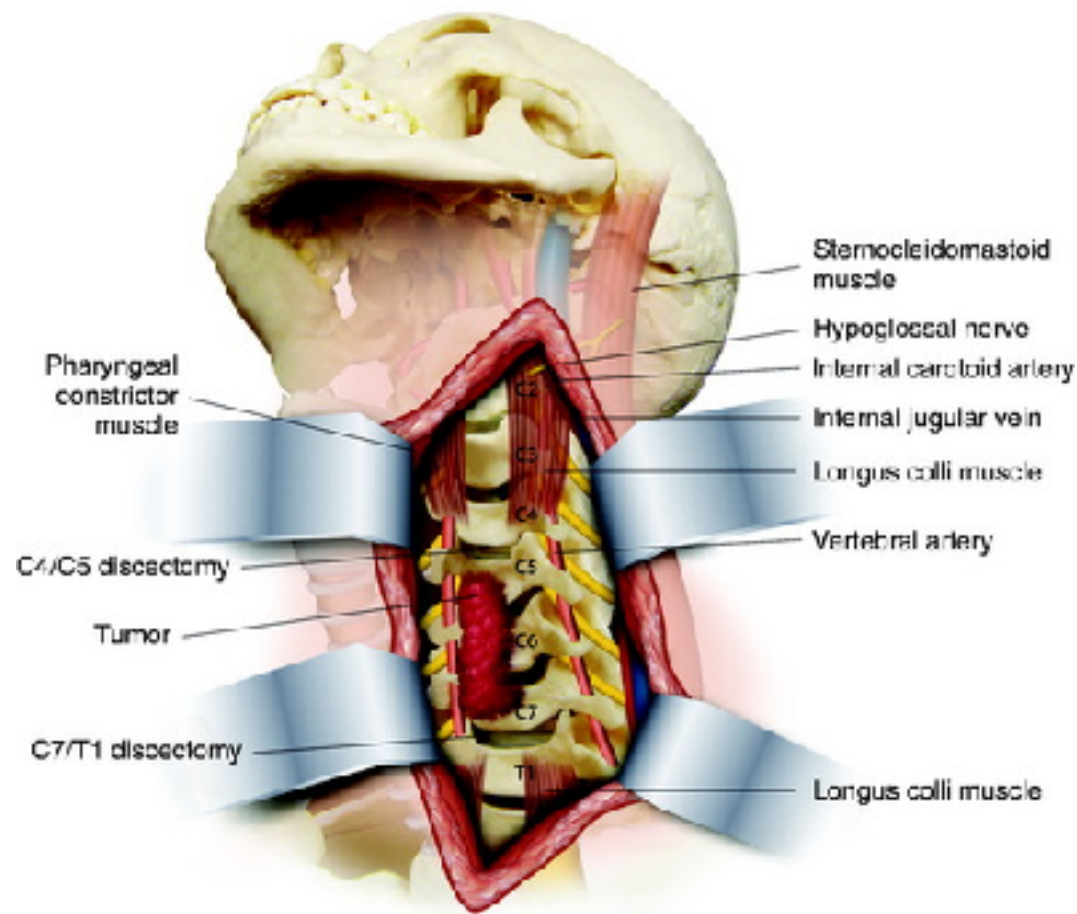
Cervical Spondylitic Myelopathy is a degenerative process affecting the cervical vertebral bodies and intervertebral discs.

This process can lead to stenosis of the central spinal canal, compressing the cervical spinal cord and producing a syndrome of spinal cord dysfunction.



# Background

- Cervical Spine surgery is a common procedure that can be used for a wide range of pathologies including myelopathy.
- There are two different approaches which can be used:
  - Ventral Cervical Approach.
  - Dorsal Cervical Approach.



# Aim

World Neurosurg. 2016 Oct;94:1-5. doi: 10.1016/j.wneu.2016.06.099. Epub 2016 Jun 30.

## **Cervical Spine Surgery: Approach-Related Complications.**

Harel R<sup>1</sup>, Stylianou P<sup>2</sup>, Knoller N<sup>3</sup>.

- The current study examines which approach is safer for three or more levels treated for cervical myelopathy.
- We try to collect additional data that can help us determine which of the approaches involves less complication rates, and better outcome.

# Methods

- Retrospective Cohort.
- Evaluation of files and images of patients who underwent surgery either by the Anterior or the Posterior Cervical Approach.
- The exposure variable is the surgery approach - Anterior/Posterior.
- The outcome variables are demographics, Surgery duration and EBL, neurologic change, complications - infection, instrumentation and mortality.

# Sample Size Calculation

$Z_{\alpha}$  – alpha error, 2 sided = 1.96

$Z_{1-\beta}$  – Power of study 80% = 0.8416

$\sigma$  – SD = 0.307

$$n = \frac{2(Z_{\alpha} + Z_{1-\beta})^2 \sigma^2}{\Delta^2}$$

$\Delta$  – Effect size = 0.087

$$\frac{2(1.96+0.8416)^2(0.307)^2}{(0.087)^2} = 195$$

# Data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
	ID	Date	Family Name	First Name	Age	Gender	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type	Ant. type	Post. type
9	310781620.00	23/11/2011	Dovzhik	David	62	1	1	2	E									1	1	2	13	103	17	107	2		4	2
10	314058033	26/10/2011	Milhim	Ahmed	37	1	1	1	D										1	2	13	103	16	106	2		3	1
11	4204517.00	26/10/2011	Zidki	Sarah	62	0	1	2	E										1	2	16	106	17	107	1	1	1	
12	70363437.00	26/10/2011	Chen	Hertzel	61	1	1	2	E									1	1	2	15	15	17	107	1		2	1
13	54726591.00	27/12/2011	Barnes	Alphons	54	1	1	3E	D										1	2	13	103	16	106	2		3	2
14	57686685.00	27/11/2011	Hazam	Rachel	49	0	2	3	D								1			2	0	0	17	107	4			
15	8800594750	29/11/2011	zumovska	Irina	40	0	1	1	E										1	2	15	15	17	107	1		2	1
16	8274658.00	09/02/2011	Havkin	Boaz	63	1	1	2	D	1									1	2	13	103	17	107	3		4	2
17	69550572.00	09/02/2011	Peretz	Hana	52	0	1	2	D										1	2	13	103	14	104	1	1	1	
18	43430586.00	09/02/2011	Azulay	Nissim	29	1	1	2	D						1				1	2	12	102	13	13	1	1	1	
19	53633145.00	02/03/2011	Mizrani	Dina	55	0	1	2	D						1			1	2	15	15	16	106	1		1	1	
20	21851233.00	02/03/2011	Hirbawi	Mahdi	35	1	1	2	D							1		1	2	14	104	21	201	3		4	3	
21	40138406.00	07/03/2011	Almagor	Anat	30	0	1	2	D									1	3	15	15	16	106	1	1	1		
22	42375931.00	16/03/2011	Trabulsi	Dina	66	0	1	3	D						1		1	1	2	14	104	15	105	1	1	1		
23	59691782.00	16/03/2011	Nakash	Uzi	45	1	1	2	D	1								1	2	14	104	16	106	1		2	1	
24	4020848.00	16/03/2011	Levy	Annon	64	1	2	2	D									1	2	12	102	17	107	3				
25	55576302.00	04/04/2011	Mordocha	Yakov	52	1	2		C									1	2	13	103	17	107	5				
26	65187981.00	14/04/2011	Cohen	Shlomo	71	1	1	3	C							1	1	1	2	16	106	21	201	1		2	1	
27	31834450.00	27/04/2011	Mesika	Benny	36	1	1	2	D									1	2	15	15	17	107	1		2	1	
28	1565662.00	27/04/2011	Levy	Moshe	69	1	2		D							1			2	13	103	17	107	5				
29	36367470.00	29/04/2011	Memovich	Michael	35	1	1	3E	A									1	8	14	104	16	106	1		2	1	
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
	ID	Date	Surgeon	Patient	Age	Gender	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type	Spine Level	Spine Type
9	310781620.00	23/11/2011	Dovzhik	David	62	1	1																					
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675 cervical surgeries  
663 patients  
406 Myelopathy patients  
216 3 level and higher  
156 AA, 60 PA

Complete

ANT NEW

Kyphosis

Ant

Post

+

Ready

8



# Data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
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675 cervical surgeries  
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216 3 level and higher  
156 AA, 60 PA

# Results

	N	Minimum	Maximum	Mean	Std. Deviation
1 age	156	26.00	83.00	59.2692	11.87643
EBL (cc)	146	0	1000	90.88	195.691
length_of_stay	155	1	28	4.67	4.642
length_of_followup	148	1	11	2.06	1.395
surgery_duration	146	50	257	101.53	29.549
Anesthesia_duration	146	76	283	146.22	36.096
v1	166	.0	139.0	42.097	21.3407
Predicted probability	156	.11231	.36127	.2415781	.05498458
Predicted probability	147	.01633	.42565	.0902060	.06648084
Predicted probability	147	.01633	.42565	.0902060	.06648084
Predicted probability	147	.00056	.68741	.0709363	.14130396
no_of_levels_new	156	3.00	5.00	3.4038	.55392
Predicted probability	147	.07322	.47429	.1643192	.06694172
Predicted probability	147	.00065	.81057	.1398196	.18882783
Valid N (listwise)	136				
2 age	60	4.00	86.00	64.3667	14.64607
EBL (cc)	52	0	1300	160.58	288.732
length_of_stay	60	1	22	6.60	4.656
length_of_followup	59	1	4	1.75	.467
surgery_duration	52	61	222	122.69	30.637
Anesthesia_duration	50	118	321	181.52	44.249
v1	58	-110.0	150.0	46.483	39.1825
Predicted probability	60	.13373	.39049	.2658688	.05938319
Predicted probability	53	.00000	.34990	.1229639	.09084736
Predicted probability	53	.00000	.34990	.1229639	.09084736
Predicted probability	53	.03139	1.00000	.8029724	.26288486
no_of_levels_new	60	3.00	7.00	4.3500	.73242
Predicted probability	53	.14889	.98466	.3542361	.21233301
Predicted probability	53	.03406	1.00000	.5446440	.22962893
Valid N (listwise)	48				

**Table 1:** Patients demographics, risk factors and surgical indication.

	Anterior approach	Posterior Approach	p value
Number	156	60	
Age	59	64	0.009
Gender (males %)	71.8%	80%	0.09+
ASA (1 & 2 Grades %)	56.4%	41.7%	0.26
ASIA D & E (%)	89.8%	81.7%	0.29
smoking %	41%	20%	0.002
Obesity %	%31.4	%20	0.065
Diabitis Melitus (%)	25%	31.7%	0.21
IHD (%)	5.20%	23.3%	0.39
HTN (%)	42.3%	46.7%	0.33
Kyphosis (%)	12.8%	5%	0.07