

Prognostic Factors for Recovery in Spinal Cord Injury After Open Descending and Thoracoabdominal Aortic Aneurysm Repair

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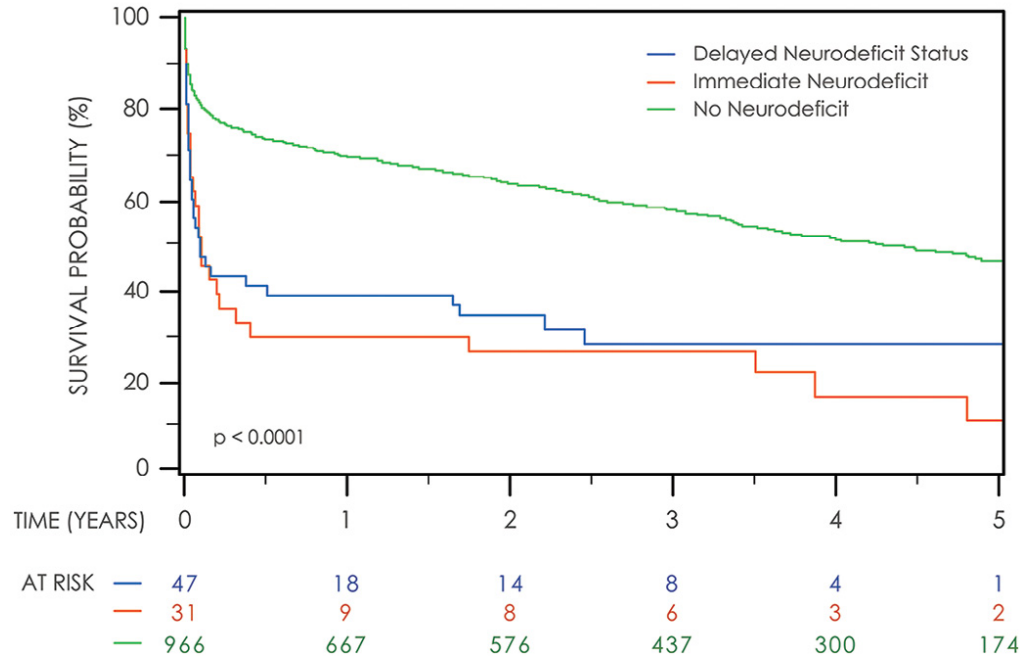
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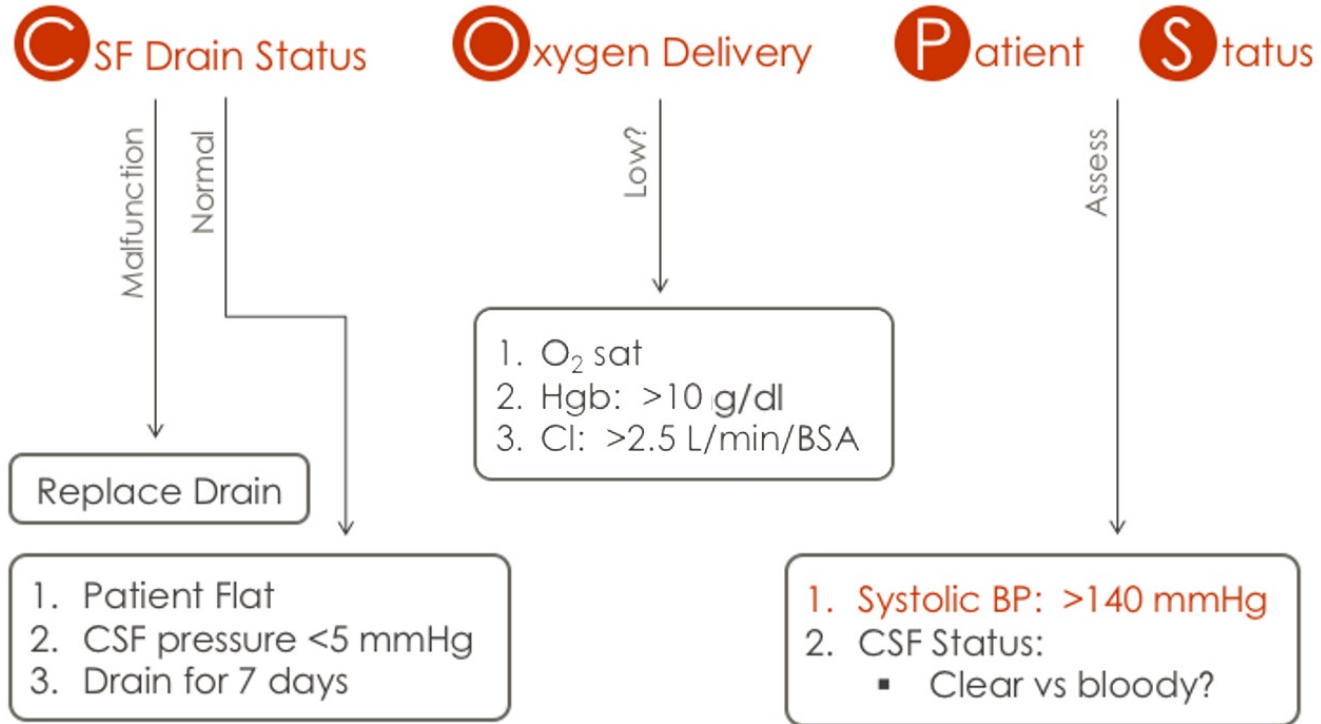
Objective

Spinal cord injury (SCI) after descending thoracic and thoracoabdominal aortic aneurysm (DTAA/TAAA) repair triggers poor prognosis.

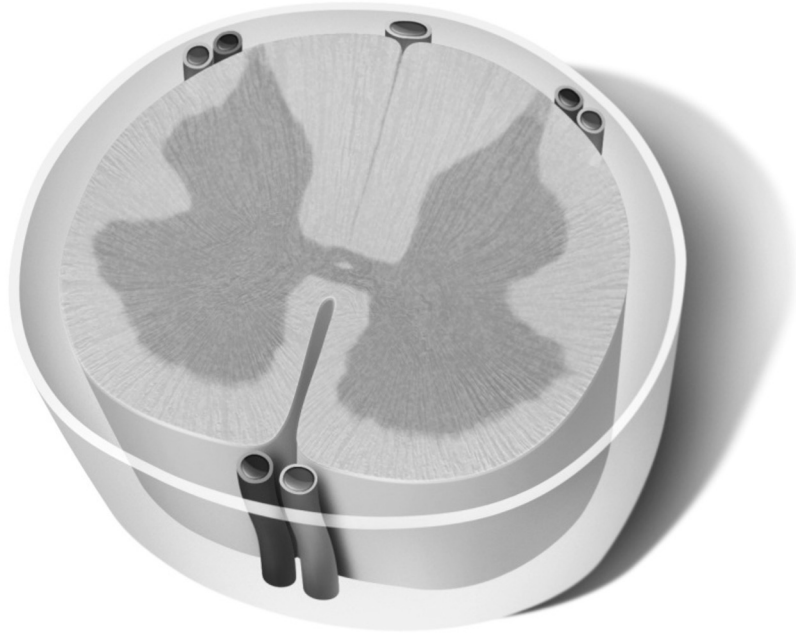
Special protocol to treat SCIs are used in our institution. We retrospectively reviewed what are the predictors for recovery from SCI.



Modified COPS Protocol to Treat SCI



2004-Current



SCI=paraplegia+paraparesis

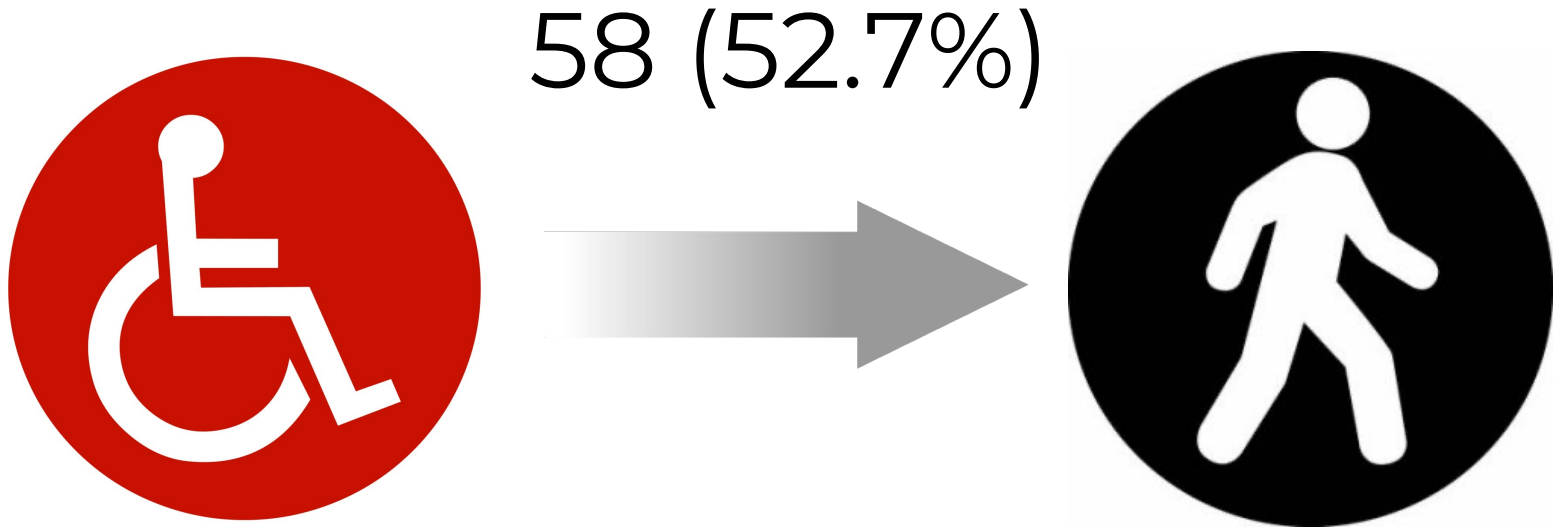
- 1125 DTAA/TAAA repairs
- 65.0 ± 12.2 years old



110 SCI (9.8%)

- 28 immediate
- 82 delayed

How Many Recovered from SCI?



Functional recovery: ambulatory at discharge or an increase in modified Tarlov score of 2 or more.

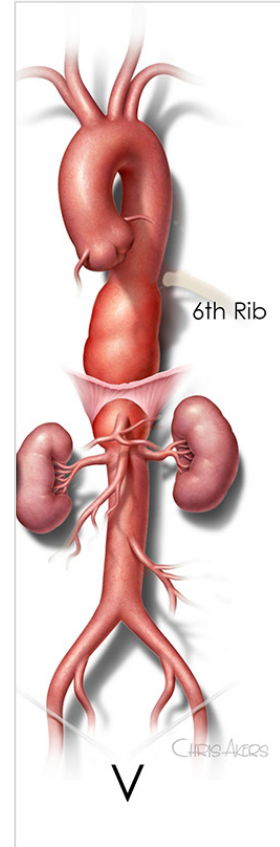
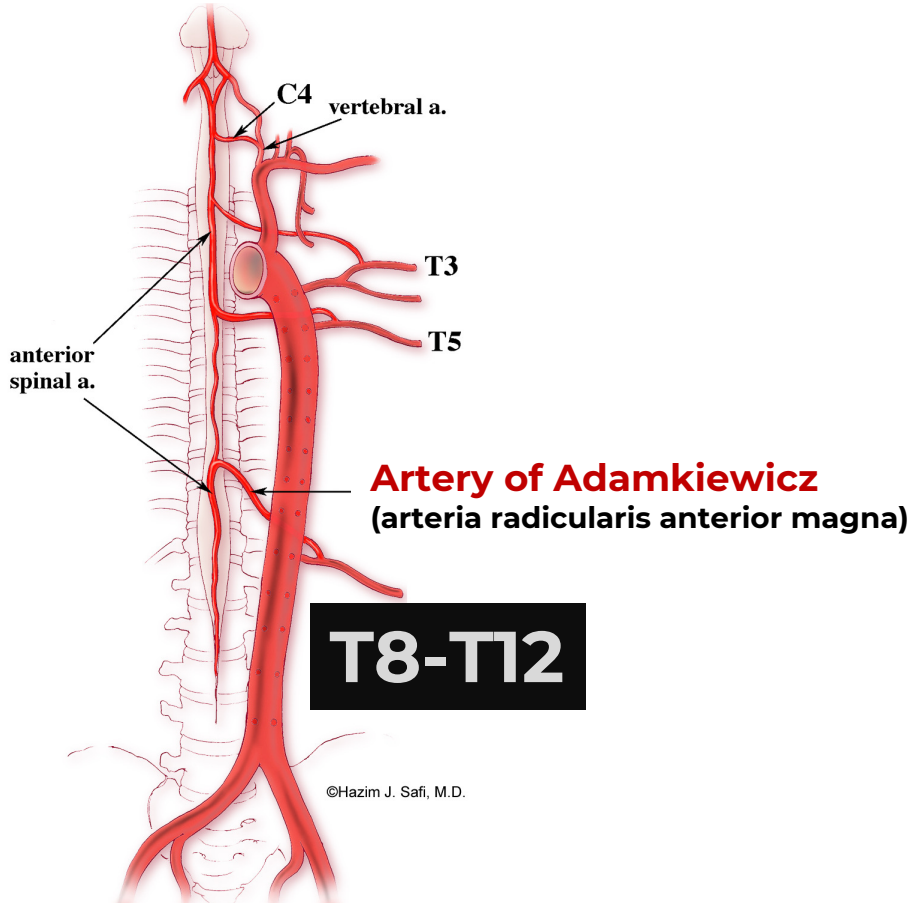
	Recovered M=58	No Recover N=52	P-value
Age	64.8±12.4	65.2±12.2	0.804
Female	19 (33%)	16 (31%)	0.823
Heritable Aortic Dz	12 (21%)	18 (35%)	0.102
CKD Stage 1	20 (35%)	13 (25%)	0.279
Stage 2	14 (25%)	16 (31%)	0.436
Stage 3a	11 (19%)	7 (13%)	0.436
Stage 3b	3 (5%)	9 (17%)	0.064
Stage 4	9 (16%)	4 (8%)	0.204
Stage 5	0 (0%)	3 (6%)	0.102
DTAAA	12 (21%)	5 (10%)	0.109
Extent I	10 (17%)	8 (15%)	0.793
Extent II	16 (28%)	13 (25%)	0.759
Extent III	13 (22%)	16 (31%)	0.321
Extent IV	7 (12%)	5 (10%)	0.680
Extent V	0 (0%)	5 (5%)	0.016
COPD	37 (64%)	24 (46%)	0.063
HTN	55 (95%)	50 (96%)	1.000
CAD	23 (40%)	17 (33%)	0.449

	Recovered M=58	No Recover N=52	P-value
Emergent	4 (7%)	13 (25%)	0.016
MEP loss	35 (60%)	39 (75%)	0.102
SSEP loss	17 (29%)	42 (81%)	<0.001
Intraop hypotension	0 (0%)	11 (21%)	<0.001
Immediate SCI	5 (9%)	23 (44%)	<0.001
Delayed SCI	53 (91%)	29 (56%)	<0.001

Predictors for Recovery

Variables (number present in SCI)	Recovery (%)	Odds Ratio Recovery vs. Permanent	Confidence Intervals	P-value
Female (N=35)	19 (54%)	1.096	0.490-2.451	0.823
Connective tissue disorder (N=30)	12 (40%)	0.493	0.210-1.158	0.102
Aortic dissection (N=51)	27 (53%)	1.018	0.480-2.153	0.967
Emergent repair (N=17)	4 (24%)	0.222	0.067-0.733	0.016
Extent V repair (N=5)	0 (0%)			0.021
Intraop CSFD use (N=103)	54 (52%)	0.827	0.176-3.879	1.000
MEP loss (N=74)	35 (47%)	0.507	0.224-1.151	0.102
SSEP loss (N=59)	22 (4%)	0.099	0.041-0.241	<0.001
Immediate SCI (N=28)	5 (18%)	0.119	0.041-0.346	<0.001

Why TAAA Extent V?



Possible statistical error due to very low incidence of SCI in this group

(lowest in all DTAA/TAAA repair in our experience)

Why Emergent Repair?

- Hypotension
- ICA reattachment
- CSFD

MEP vs. SSEP Loss

Loss of response to ischemia

Cortex-EEG

30 sec

Gray matter-MEP

2 min

Motor white matter-MEP

5 min -

Sensory white matter-SSEP

7 min -

Peripheral nerve-SSEP/MEP

20 min -

MEP loss:

Gray matter-"penumbra"
no infarction yet

SSEP loss:

Gray matter - "penlucida"
beginning of infarct
White matter - "penumbra"

SSEP loss = advanced ischemia

Conclusions


- Nearly half of the patients who developed SCI after DTAA/TAAA had functional recovery
- Emergent repair, SSEP loss, TAAA extent V, and immediate SCI had less likelihood of recovery from SCI.

Thank You!



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