AANS/CNS Joint Cerebrovascular Annual Meeting
Los Angeles, California
February 15-16, 2016

Impact of ASPECT Scores and Infarct Distribution on Outcome Among Patients Undergoing Thrombectomy for Acute Ischemic Stroke with the ADAPT Technique

Alejandro M. Spiotta MD; John Hungerford
Medical University of South Carolina

MUSC MEDICAL UNIVERSITY of SOUTH CAROLINA

Introduction

This study investigates the associations of ASPECTS (Alberta Stroke Program Early CT Score), infarct distribution, and sidedness of acute infarction with clinical outcomes following intervention with the 'a direct aspiration first pass technique' (ADAPT).

Methods

A retrospective review was performed from a prospectively collected database of all consecutive patients at a single tertiary referral center who underwent aspiration thrombectomy with ADAPT for emergent middle cerebral artery occlusion between Dec 2012 and May 2015. CT imaging was retrospectively reviewed by a blinded radiologist to calculate the ASPECT scores and to determine the distribution of infarction. Clinical outcomes were compared for ASPECTS, regional infarction distribution (cortical, subcortical, or both), and sidedness.

Results

154 patients were treated with the ADAPT technique during the study period. Similar overall good outcomes were achieved for patients with perfect and non-perfect ASPECT scores (p = 0.20). Similar overall good outcomes were also achieved for patients with "poor" ASPECTs (<=6) compared to those with ASPECTs >6 (p = 0.91), despite higher hemorrhage rates (p = 0.015). Regional distribution and sidedness of core infarction on the pre-intervention CT also did not correlate with worse outcomes.

Conclusions

Patients with moderate sized core infarcts involving various distributions in either hemisphere can benefit from thrombectomy and potentially achieve similar good outcomes compared with those who have no core infarction at presentation.

A treatment algorithm for acute ischemic stroke which employs hardline ASPECTS thresholds or one which excludes patients with basal gangila infarcts might preclude patients who would potentially benefit from mechanical thrombectomy with ADAPT.

All patients demographics and comparison by ASPECTS status

Variable	N	Total N = 154	Non-Perfect ASPECTS N = 122	Perfect ASPECTS N = 32	p-value
Demographics					
Age	154	67.18 (14.14)	66.81 (13.67)	68.59 (15.96)	0.53
Gender (Female)	154	77 (50.0)	56 (45.9)	21 (65.6)	0.047
Procedure Data					
Side (Left)	151	83 (55.0)	61 (51.3)	22 (68.8)	0.08
Hyperdense MCA sign	154	59 (38.3)	55 (45.1)	4 (12.5)	<0.001
Infarct Region	120				N/A
Cortical		45 (37.5)	45 (37.5)		
Subcortical		27 (22.5)	27 (22.5)		
Both Cortical and Subcortical		48 (40.0)	48 (40.0)		
Symptom onset to procedure time (minuntes)	123	454.31 (344.68)	443.54 (352.66)	498.7 (312.58)	0.48
IV tPA	142	55 (35.0)	44 (36.1)	10 (31.3)	0.61
NIHSS Presenting	154	14.89 (6.23)	15.60 (6.46)	12.19 (5.85)	0.008
NIHSS Discharge	72	1.24 (3.57)	1.49 (3.90)	0.08 (0.28)	0.008
Recanalization time (minutes)	152	39.97 (36.84)	39.64 (37.93)	41.22 (32.96)	0.83
Post-thrombectomy TICI flow	154				0.23
0-2A		8 (5.2)	5 (4.1)	3 (9.4)	
2B-3		146 (94.8)	117 (95.9)	29 (90.6)	
Outcome Data					
mRS	134				0.20
3-6	0	63 (47.0)	53 (49.5)	10 (37)	
0-2	1	71 (53..0)	54 (50.5)	17 (63)	
Complication	154	1 (0.7)	1 (0.8)	0 (0.0)	1.0
Death (mRS = 6)	134	14 (10.4)	11 (10.3)	3 (11.1)	0.90
ICH	154	10 (6.5)	9 (7.4)	1 (3.1)	0.39

'poor' ASPECTS vs more favorable ASPECTS

Variable	N	Total N = 154	ASPECTS = 6 N = 31	ASPECTS = 7 N = 123	p-value
mRS	134				0.91
3-6		63 (47.0)	12 (48.0)	51 (46.8)	
0-2		71 (53.0)	13 (52.0)	58 (53.2)	
TICI flow	154				0.58
0-2A		145 (94.2)	26 (83.9)	119 (96.7)	
2B-3		9 (5.8)	5 (16.1)	4 (3.3)	
Death	134	14 (10.4)	4 (16)	10 (9.2)	0.31
Side (Left)	151	83 (55)	18 (58.1)	65 (54.2)	0.70
ICH	154	10 (6.5)	5 (16.1)	5 (4.1)	**0.015**

Subcortical Infarction

Variable	N	Total N = 108	Subcortical Infarction N = 76	Perfect ASPECTS N = 32	p-value
mRS	94				0.18
3-6		45 (47.9)	35 (52.2)	10 (37.0)	
0-2		49 (52.1)	32 (47.8)	17 (63.0)	
TICI flow	108				0.26
0-2A		6 (5.6)	3 (3.9)	3 (9.4)	
2B-3		102 (94.4)	73 (96.1)	29 (90.6)	
Death	94	12 (12.8)	9 (13.4)	3 (11.1)	0.76
Side (Left)	107	62 (57.9)	40 (53.3)	22 (68.8)	0.14
ICH	108	9 (8.3)	8 (10.5)	1 (3.1)	0.85

Cortical Infarcts

Variable	N	Total N = 125	Cortical Infarction N = 93	Perfect ASPECTS N = 32	p-value
mRS	109				0.34
3-6		49 (45.0)	39 (47.6)	10 (37.0)	
0-2		60 (55.0)	43 (52.4)	17 (63.0)	
TICI flow	125				
0-2A		6 (4.8)	3 (3.2)	3 (9.4)	0.16
2B-3		119 (95.2)	90 (96.8)	29 (90.6)	
Death	109	11 (10.1)	8 (9.8)	3 (11.1)	0.84
Side (Left)	123	71 (57.7)	49 (53.8)	22 (68.8)	0.14
ICH	125	8 (6.4)	7 (7.5)	1 (3.1)	0.38

Both Cortical and Subcortical

Variable	N	Total N = 154	Both Cortical and Subcortical Infarctions N = 48	Cortical Infarctions N = 55	Subcortical Infarctions N = 27	p-value
mRS	134					0.73
3-6		63 (47.0)	22 (51.2)	17 (43.6)	12 (52.2)	
0-2		71 (53.0)	21 (48.8)	22 (56.4)	11 (47.8)	
TICI flow	154					0.54
0-2A		8 (5.2)	1 (2.1)	2 (4.4)	2 (7.4)	
2B-3		146 (94.8)	47 (97.9)	43 (95.6)	25 (92.6)	
Death	134	14 (10.4)	6 (14)	2 (5.1)	2 (8.7)	0.39
Side (Left)	151	83 (55.0)	28 (58.3)	21 (48.8)	11 (42.3)	0.39
ICH	154	10 (6.5)	6 (12.5)	1 (2.2)	2 (7.4)	0.17

Left Cortex vs Right Cortex

Variable	N	Total N = 91	Left Cortex Infarction N = 49	Right Cortex Infarction N = 42	p-value
mRS	80				0.26
3-6		39 (48.8)	23 (54.8)	16 (42.1)	
0-2		41 (51.3)	19 (45.2)	22 (57.9)	
TICI flow	91				0.47
0-2A		3 (3.3)	1 (2.0)	2 (4.8)	
2B-3		88 (96.7)	48 (98)	40 (95.2)	
Death	80	8 (10.0)	4 (9.5)	4 (10.5)	0.88
ICH	91	7 (7.7)	4 (8.2)	3 (7.1)	0.86

Left Subcortical vs Right Subcortical

Variable	N	Total N = 75	Left Subcortical Infarction N = 40	Right Subcortical Infarction N = 35	p-value
mRS	67				0.07
3-6		35 (52.2)	22 (62.9)	13 (40.6)	
0-2		32 (47.8)	13 (37.1)	19 (59.4)	
TICI flow	75				0.48
0-2A		3 (4.0)	1 (2.5)	2 (5.7)	
2B-3		72 (96)	39 (97.5)	33 (94.3)	
Death	67	9 (13.4)	5 (14.3)	4 (12.5)	0.83
ICH	75	7 (9.3)	4 (10)	3 (8.6)	0.83