

# ACCEPTED VERSION

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**Endovascular treatment for acute ischaemic stroke: experience in South Australia**

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Letter to the Editor:

**Endovascular Treatment for Acute Ischaemic Stroke: Experience in South Australia**

Dear Editor,

Recent evidence from the MR CLEAN,<sup>1</sup> EXTEND-IA<sup>2</sup> and ESCAPE<sup>3</sup> trials showed intra-arterial treatment in acute ischaemic stroke caused by proximal intracranial arterial occlusion resulted in better functional outcomes at 90 days when compared with standard treatment. This contests prior evidence from randomised controlled trials indicating non-superiority of endovascular therapy.<sup>4-6</sup>

We conducted a retrospective analysis of 31 consecutive patients treated with endovascular therapy for acute ischaemic stroke between November 2008 and December 2012 at The Queen Elizabeth Hospital, a tertiary referral centre at a time of change in South Australia.<sup>7</sup> Baseline characteristics and type of endovascular method are outlined in Table 1. Outcomes were assessed using Arterial Occlusive Lesion (AOL) recanalisation scores and 90-day Modified Rankin Scores (mRS) (Table 2).

Successful recanalisation, defined by AOL 2-3, was achieved in 77.4% of our patients. This was lower than MR CLEAN<sup>1</sup> and EXTEND-IA,<sup>2</sup> comparable to ESCAPE<sup>3</sup> and IMS III<sup>6</sup> but higher than MR RESCUE.<sup>4</sup> Our patient group had higher rates of death, intracranial haemorrhage (ICH) and worse functional outcomes than reported in EXTEND-IA, MR CLEAN, IMS III and SYNTHESIS.<sup>1,2,5,6</sup> However our study showed better functional outcomes and ICH was less common than in MR RESCUE.<sup>4</sup>

We used multiple endovascular modalities, which limits comparison of our results; later-generation mechanical devices may contribute to improved rates of recanalisation seen in the more recent trials.<sup>2,8</sup> Furthermore our study included patients with posterior territory stroke, which were not included in MR CLEAN, EXTEND-IA, ESCAPE or MR RESCUE, although they were included in IMS III and SYNTHESIS.<sup>1-6</sup> Stratification of our results showed these patients had poorer outcomes compared with anterior circulation vessel occlusion (Table 3). A number of factors may contribute to differences in outcomes including variability of interventional radiologist experience and time from stroke onset to treatment initiation. In our patient group the mean time from stroke onset to arrival at hospital was 59 minutes. This was better than the mean of 78 minutes in EXTEND-IA.<sup>2</sup> Our mean time to initiation of intravenous thrombolysis was 123 minutes, which compares with 127 in EXTEND-IA, 122.4 in IMS III, 110 in ESCAPE and 85 in MR CLEAN.<sup>1-3,6</sup> Mean time to the commencement of endovascular therapy was 235 minutes in our study, 210 minutes in EXTEND-IA and 260 minutes in MR CLEAN.<sup>1-3</sup>

Given the recently published evidence supporting endovascular therapy,<sup>8</sup> we suggest it is important to report outcomes from past “real world experience” which in comparison to current evidence demonstrates why the initial studies were negative. Translation of the current evidence to our stroke services is now the critical step for best clinical outcomes.

**Table 1. Baseline Characteristics\* (n=31)**

<b>Demographic Data</b>	
Age, years – mean (range)	66 (28-86)
Male gender – n (%)	15 (48.4)
<b>Stroke</b>	
Territory – n (%)	
Anterior	26 (83.9)
Posterior	5 (16.1)
Cause – n (%)	
Cardiogenic embolism	14 (45.2)
Large-artery atherosclerosis	5 (16.1)
Dissection	2 (6.5)
Unknown	10 (32.3)
NIHSS score, mean (range)	17 (7-28)
Time from stroke onset – minutes, mean (range)	
To hospital (n=27)†	58.9 (20-194)
To intravenous thrombolysis (n=14)‡	123 (73-267)
To endovascular therapy (n=31)	235 (45-405)
<b>Endovascular procedure</b>	
Mechanical device or stent – n (%)	25 (80.6)
Penumbra	20/25 (80)
Solitaire	8/25 (32)
Trevo	3/25 (12)
Merci	1/25 (4)

Permanent stent	6/25 (24)
Intra-arterial rtPA – n (%)	10 (32.3)

\*Data was recorded at time of presentation to hospital or at time of stroke if already an inpatient.

†4 patients in hospital at the time of stroke were not included; 4 other patients were transferred from another hospital (time to arrival at initial hospital was used in these cases).

‡16 patients underwent intravenous therapy prior to endovascular therapy; time parameters were recorded in 14.

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**Table 2. Complications and Outcomes (n=31)**

<b>Complications – n (%)</b>	
ICH	18 (58.1)
Symptomatic	6 (19.4)
Asymptomatic	12 (38.7)
Symptomatic cerebral oedema	3 (9.7)
Further stroke	2 (6.5)
Bleeding at other sites	7 (22.6)
Sepsis	9 (29)
Death	9 (29)
<b>Outcome measures – n (%)</b>	
AOL post-procedure	
0	5 (16.1)
1	2 (6.5)
2	9 (29)
3	15 (48.4)
mRS at 90 days*	
0-1	3 (10)
0-2	8 (26.7)
90-day mortality	14 (46.7)

\*Recorded in 30 patients.

**Table 3. Outcomes Stratified by Vessel Occlusion Location (n=31)**

<b>Vessel Occluded</b>	<b>Successful</b>	<b>90-day mRS</b>	<b>90-day</b>
	<b>recanalisation</b>	<b>0-2*</b>	<b>mortality*</b>
	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>
Anterior	19/26 (73)	8/25 (32)	10/25 (40)
Internal carotid artery	9/12 (75)	2/11(18)	5/11 (45)
Middle cerebral artery, M1	7/10 (70)	4/10 (40)	4/10 (40)
M2 – single occlusion	2/3 (66.7)	1/3 (33.3)	1/3 (33)
M2 – multiple occlusions	1/1 (100)	1/1 (100)	0/1 (0)
Posterior	5/5 (100)	0/5 (0)	4/5 (80)

\* Not recorded in 1 patient.

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