





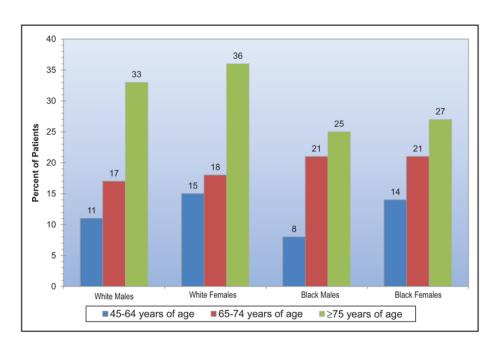


MIDTERM RESULTS OF CAROTID ENDATERECTOMY AT DONG NAI GENERAL HOSPITAL

ANH TUAN VO, MD, PhD
Thoracic and Cardiovascular surgery Department
Dong Nai General Hospital

INTRODUCTION

- Stroke: 5th leading cause of death
- Increased with age
- Create severe disability
- Burden for economy and society



1 year mortality of stroke



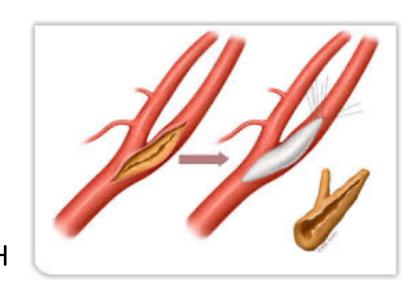






CAROTID ENDARTERECTOMY

- First operation: 1953
- Prevention of secondary stroke
- Proved to be very efficient
- Assessment of early and midterm results at DNGH











METHODS

- Retrospective case series
- Inclusion criteria: Pts underwent carotid endarterectomy at DNGH
- Exclusion criteria: Uncontactable patients
- Duration: 1/2017 10/2021









METHODS

- Surgical indications:
 - o 2021 ESO guidelines
 - Severity of stenosis: NASCET (CT scan and echo)
- Surgical methods:
 - Conventional endarterectomy
 - Eversion technique
- Cerebral perfusion: INVOS
- Shunt:
 - Decreased INVOS > 20% after carotid clamping
 - Post-clamping internal carotid pressure < 40 mmHg











RESULTS

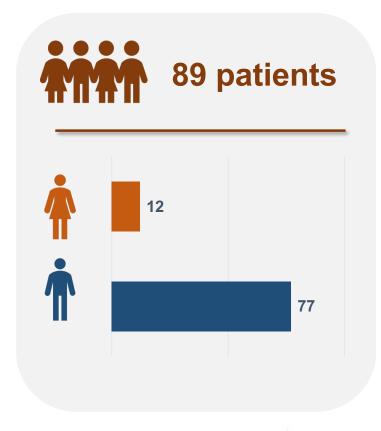








DEMOGRAPHICS





Average age: 65.2 ± 11.1 (54 - 89)

Characteristics	Number of pts
Smoking	79 (88.8%)
Hypertension	86 (96.6%)
Type II DM	25 (28.1%)
PAD	10 (11.2%)
CAD	40 (44.9%)









INTRAOPERATIVE CHARACTERISTICS



INVOS 44.9%

TEMPORARY SHUNT

17.9%

EVERSION 40.4% **CONVENTIONAL PATCH** 59.6%

EARLY RESULTS



MAIN OUTCOMES



Mean postoperative time 6.97 ± 3,96 days



Carotid related mortality

1 patients (2.2%)



Recurrent stroke

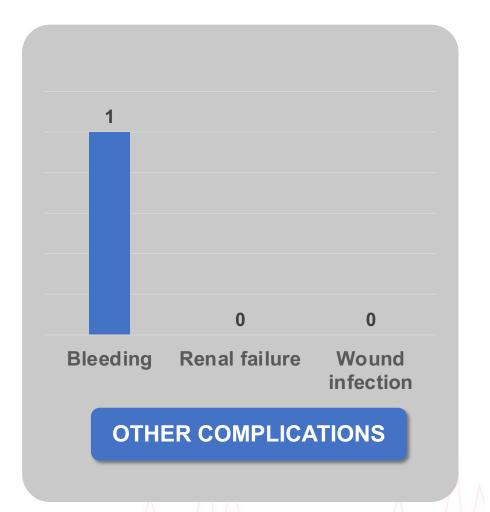
0











MIDTERM RESULTS



MAIN OUTCOMES



Mean follow-up time

34.2 months



Carotid related mortality

1 patients (2.2%)



Recurrent stroke **0**



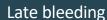












Late bleeding 2 months after surgery



Cancer

Late mortality due to cancer



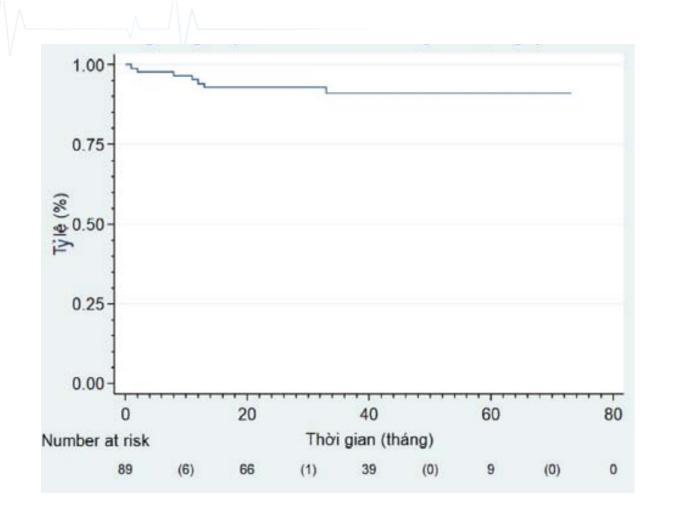
Heart failure

Late mortality due to heart failure and CAD



3 pts

2 pts



All cause mortality

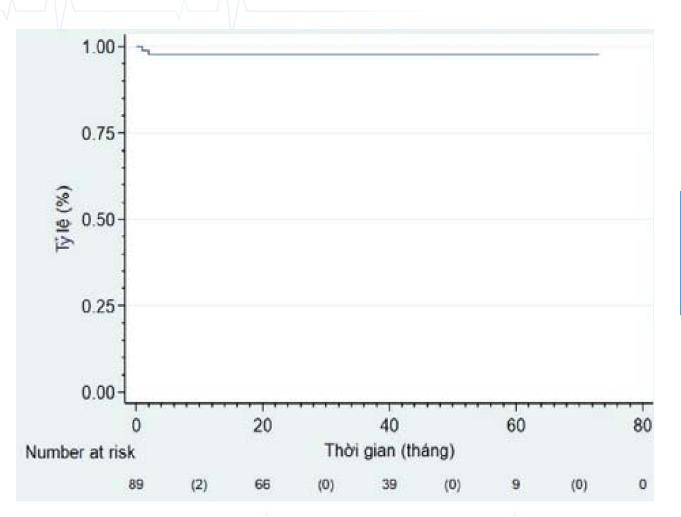
Kaplan Meier











Carotid related mortality

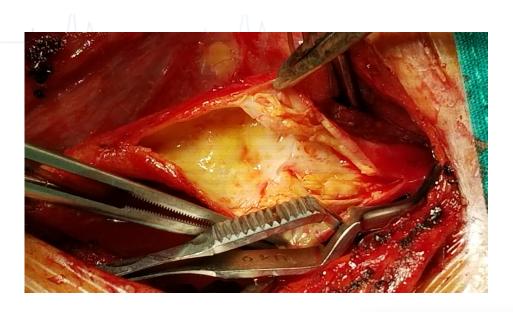
Kaplan Meier

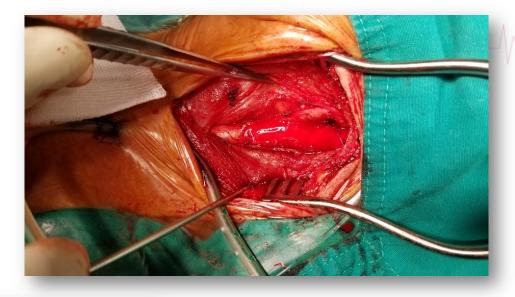














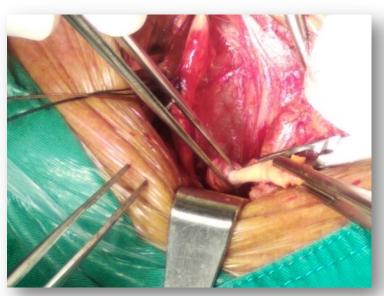
























Left



Leg





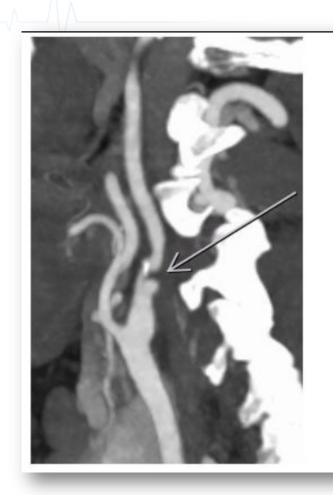


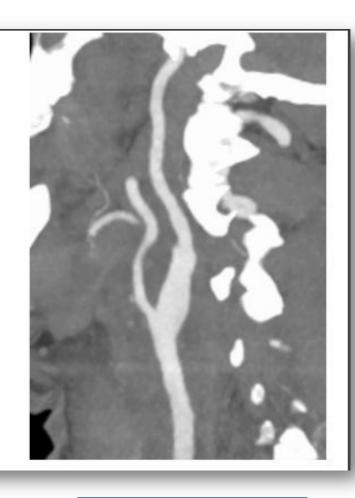












Trước phẫu thuật











DISCUSSION











European Stroke Organisation guideline on endarterectomy and stenting for carotid artery stenosis

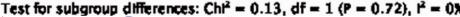
Leo H Bonati, Stavros Kakkos, Joachim Berkefeld, more...

Show all authors >

First Published May 11, 2021 Research Article Check for updates

https://doi.org/10.1177/23969873211012121

Test for overall effect: Z = 3.15 (P = 0.002) 1.2.2 Women ACST 1 2010	1.2.1 Men ACST 1 2010 8 Subtotal (95% CI) Total events 8 Heterogeneity: Not applicable Test for overall effect: Z = 3.1	1021 1021	134 134	1023	100.0%	0.67 [0.52, 0.86]	M-H, Random, 95% CI
ACST 1 2010 89 1021 134 1023 100.0% 0.67 [0.52, 0.86] Subtotal (95% CI) 1021 1023 100.0% 0.67 [0.52, 0.86] Total events 89 134 Heterogeneity: Not applicable Test for overall effect: Z = 3.15 (P = 0.002) 1.2.2 Women ACST 1 2010 40 539 65 537 100.0% 0.61 [0.42, 0.89] Subtotal (95% CI) 539 537 100.0% 0.61 [0.42, 0.89]	ACST 1 2010 8 Subtotal (95% CI) Total events 8 Heterogeneity: Not applicable Test for overall effect: Z = 3.1	1021	134				•
Subtotal (95% CI) 1021 1023 100.0% 0.67 [0.52, 0.86] Total events 89 134 Heterogeneity: Not applicable Test for overall effect: Z = 3.15 (P = 0.002) 1.2.2 Women ACST 1 2010 40 539 65 537 100.0% 0.61 [0.42, 0.89] Subtotal (95% CI) 539 537 100.0% 0.61 [0.42, 0.89]	Subtotal (95% CI) Total events 8 Heterogeneity: Not applicable Test for overall effect: Z = 3.1	1021	134				
Heterogeneity: Not applicable Test for overall effect: Z = 3.15 (P = 0.002) 1.2.2 Women ACST 1 2010	Heterogeneity: Not applicable Test for overall effect: $Z = 3.1$						
Heterogeneity: Not applicable Test for overall effect: Z = 3.15 (P = 0.002) 1.2.2 Women ACST 1 2010	Heterogeneity: Not applicable Test for overall effect: $Z = 3.1$						
Subtotal (95% CI) 539 537 100.0% 0.61 [0.42, 0.89]	1 2 2 Women						
Subtotal (95% CI) 539 537 100.0% 0.61 [0.42, 0.89]	T.E.E WOMEN						
Total events 40 65			65				
	Total events 4		65				
Heterogeneity: Not applicable							
Test for overall effect: $Z = 2.55$ (P = 0.01)		(P = 0.01)	}				











Carotid Stenting Versus Endarterectomy for Asymptomatic Carotid Artery Stenosis

A Systematic Review and Meta-Analysis

Paola Moresoli, Bettina Habib, Pauline Reynier, Matthew H. Secrest, Mark J. Eisenberg and Kristian B. Filion 🖂

Originally published 5 Jul 2017 | https://doi.org/10.1161/STROKEAHA.117.016824 | Stroke. 2017;48:2150-2157

	CA	S	CE	Α	Risk Ratio		
Trial	Events	Total	Events	Total	RR	(95% CI)	Weight (%)
Any periprocedural stroke or death							
ACT I [13]	31	1072	6	348	┼■ 1.68 ((0.71; 3.99)	46.9
Brooks et al. [29]	0	43	0	42	→ 1.00 (i	0.02;49.27)	2.3
CREST [30]	15	594	8	587	1.85 ((0.79; 4.34)	50.9
Kuliha et al. [36]	0	38	0	25	→ 1.00 (0.02;53.24)	0.0
Random effects model		1747		1002	1.72 (0.95; 3.11)	
Heterogeneity: I-squared=0%							
Periprocedural disabling stroke							
ACT I [13]	5	1072	1	348	 	0.19;13.85)	33.0
Brooks et al. [29]	0	43	0	42	→ 1.00 (0.02;49.27)	10.0
CREST [30]	3	594	2	587	1.48 ((0.25; 8.84)	47.5
Kuliha et al. [36]	0	38	0	25	→ 1.00 (0.02;53.24)	9.6
Random effects model		1747		1002	1.41 (0.41; 4.84)	
Heterogeneity: I-squared=0%							
					I		









PICO 3.1: In patients with asymptomatic carotid stenosis, do endarterectomy and stenting differ in the long-term risk of ipsilateral stroke, including peri-procedural stroke in any territory or peri-procedural death?

	Stent	ing	Endartere	ctomy		Risk Ratio			Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	Year		M-H, Random, 95% CI	
Kentucky 2004	0	43	0	42		Not estimable	2004)	
Houston 2014	1	27	0	28	1.3%	3.11 [0.13, 73.11]	2014		-	
ACT-1 2016	41	1089	12	364	31.9%	1.14 [0.61, 2.15]	2016		-	
CREST 2016	36	594	28	587	55.2%	1.27 [0.79, 2.05]	2016		- 	
Carmel Medical Center 2017	2	68	1	68	2.3%	2.00 [0.19, 21.54]	2017		-	
SPACE-2 2019	6	197	5	203	9.3%	1.24 [0.38, 3.99]	2020		-	
Total (95% CI)		2018		1292	100.0%	1.25 [0.88, 1.79]			•	
Total events	86		46							
Heterogeneity: $Tau^2 = 0.00$; C	$hl^2=0.5$	5, df =	4 (P = 0.97)	$); l^2 = 0$	*			0.02	n's 4 sh	50
Test for overall effect: $Z = 1.2$	3 (P = 0.3)	22)						0.02	0.1 1 10 Favours Stenting Favours Endarterecton	







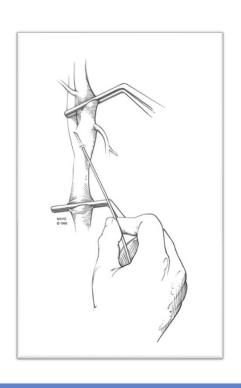


PICO 3.8: In patients with asymptomatic carotid stenosis, do endarterectomy and stenting differ in the risk of peri-procedural stroke or death?

There is moderate quality evidence that stenting is likely associated with an increased risk of periprocedural stroke or death as compared to endarterectomy (RR: 1.62, 0.96–2.76; 9 more events per 1000 patients, from 1 less to 27 more; Figure 3.8).

	Stenti	ng	Endartere	ctomy		Risk Ratio		Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	Year	M-H, Random, 95% CI
Kentucky 2004	0	43	0	42		Not estimable	2004	
CREST 2010	15	594	8	587	38.8%	1.85 [0.79, 4.34]	2010	 •
Houston 2014	0	29	0	31		Not estimable	2014	
Ostrava 2014	0	38	0	25		Not estimable	2014	
ACT-1 2016	31	1089	6	364	37.4%	1.73 [0.73, 4.11]	2016	 •
Carmel Medical Center 2017	2	68	1	68	5.0%	2.00 [0.19, 21.54]	2017	- •
SPACE-2 2019	5	197	5	203	18.7%	1.03 [0.30, 3.50]	2020	· · · · · · · · · · · · · · · · · · ·
Total (95% CI)		2058		1320	100.0%	1.62 [0.96, 2.76]		•
Total events	53		20					
Heterogenetty: Tau ² = 0.00; C	$ht^2=0.6$	7, df =	3 (P = 0.86	$3); t^2 = 0$	×			0.01 0.1 1 10 100
Test for overall effect: $Z = 1.7$								0.01 0.1 1 10 100 Favours Stenting Favours Endarterectomy

BRAIN PROTECTION STRATEGY







Post clamping pressure measurement

Brain oxygen saturation (INVOS)

Temporary shunt









> J Cardiovasc Surg (Torino). 2017 Jun;58(3):431-438. doi: 10.23736/S0021-9509.16.08173-8. Epub 2014 Jun 11.

Clinical validation of 40-mmHg carotid stump pressure for patients undergoing carotid endarterectomy under general anesthesia

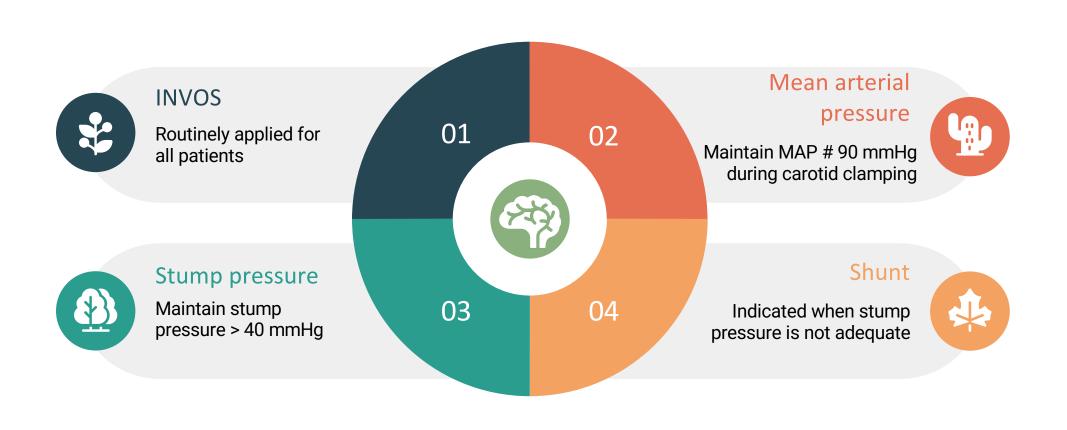
Saeid Shahidi ¹, Alan Owen-Falkenberg ², Bo Gottschalksen ³

Results: One hundred and twenty consecutive CEAs were performed in recently symptomatic patients. A significant correlation between SP and the contralateral stenosis degree of internal carotid artery (ICA) was found in our study P=0.05. Sixteen patients (14%) had SP<40 mmHg after clamping the carotid arteries. Raising blood pressure intra-operatively by 10-20% reduced the incidence of shunt insertion to only three patients (80% reduction). Of the 120 CEAs, only 2.5% (95% CI 1-6%) of patients required shunt. There was no post-operative TIA or stroke in our study. Two patients (1.65%) suffered early TIA from ipsilateral ICA after discharge from the vascular unit.

Conclusions: Using a mean SP of 40 mmHg as a threshold seems to be a safe, easy and cheap method for selective shunt insertion in fast track CEA under general anesthesia with a zero falsenegative rate. Raising the systemic blood pressure by 10-20% during cross clamping increased SP above the threshold value 40 mmHg, thus avoiding shunt insertion in a number of patients.



OUR STRATEGY TO PROTECT THE BRAIN



ROLE OF CAROTID SURGERY IN PROVICIAL HOSPITAL

NEUROLOGY TEAM

Contribute in creating a sophisticated neurology team

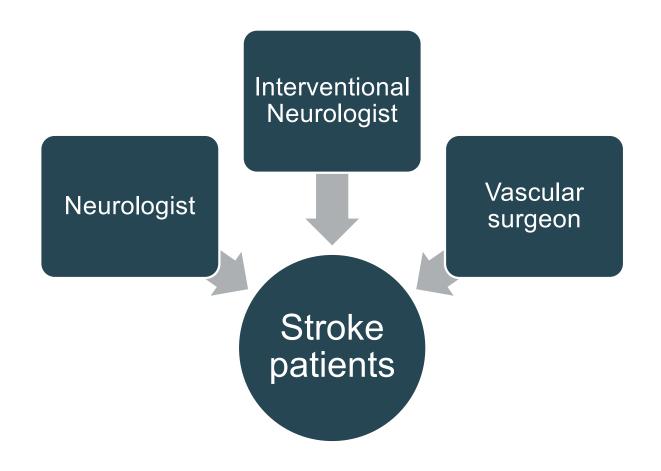
PATIENTS-FOCUS MEDICINE

Provide a full varieties of treatment options for patients

TIME IS BRAIN

Shorten the time from diagnosis to treatment

COORDINATION DIAGRAM



CONCLUSIONS

- Hollistic approach and comprehensive treatment options
- Could be implemented safely and effectively in provincial hospital
- Contribution in developing the hospitals

THANK YOU FOR YOUR ATTENTION







