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The results of EVT for Chronic Aortic Occlusion

- a multicenter retrospective study -

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COI disclosure

Disclosure

Speaker name: Taku Kato

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest



Background

Safety procedure with high success rate

Favorable patency

First author	Year	N	N eAIOD	Age, mean y	Male (%)	Technical success (%)	Clinical improvement (%)	Mortality (%) 30 d	Morbidity (%)	Follow-up, mean mo	Length of stay, mean d
Nyman ^a	2000	30	21	61	43	93	83	6.7	27	19/11 ⁸	2 ^{median}
Scheinert ^a	2001	212	212 ^b	60	78	90	88	0	11	31	4.8
Ali	2003	22	22	63	91	95	100	0	NS	12	NS
Greiner ^a	2003	25	23	NS	60	86	88	0	NS	16	NS
Rzucidlo ^a	2003	34	29	63	62	100	97	3	3	21 ^{max}	NS
Domanin ^a	2005	42	28	60	71	100	100	0	12	NS	NS
Lagana ^a	2006	19	11	66	63	95	NS	0	21	20	3.2
Ballzer	2006	89	89	64	72	97	92	0	16	36	NS
De Roeck ^a	2006	38	26	59	89	97	100	3	5	26	NS
Park	2007	218	66	64 ^d	95	98 ^d	NS	0	6 ^d	30 ^d	NS
Piffaretti	2007	43	43	66	70	100	NS	0	5 ^f	32	4.1
Bjorses ^a	2008	173	88	64	46	99	86	1.2	14	36	NS
Chang	2008	171	171	67	62	98	92	2.3	22	24 ^{median}	2 ^{median}
Gandini ^a	2008	138	138 ^c	63	75	99	99	0	7	108	NS
Hans	2008	40	40	59	60	95	NS	0	15	32	1
Sixt	2008	375	179	63	80	96	70 ^e	0	NR	NS	NS
Sharafuddin ^a	2008	66	47	64	70	94	NS	4.5	14	37 ^{median}	NS
Kashyap ^a	2008	83	65	64	57	96	NS	3.6	16	21	NS
Moise	2009	31	31	65	29	93	NS	0	45	12	3 ^{median}

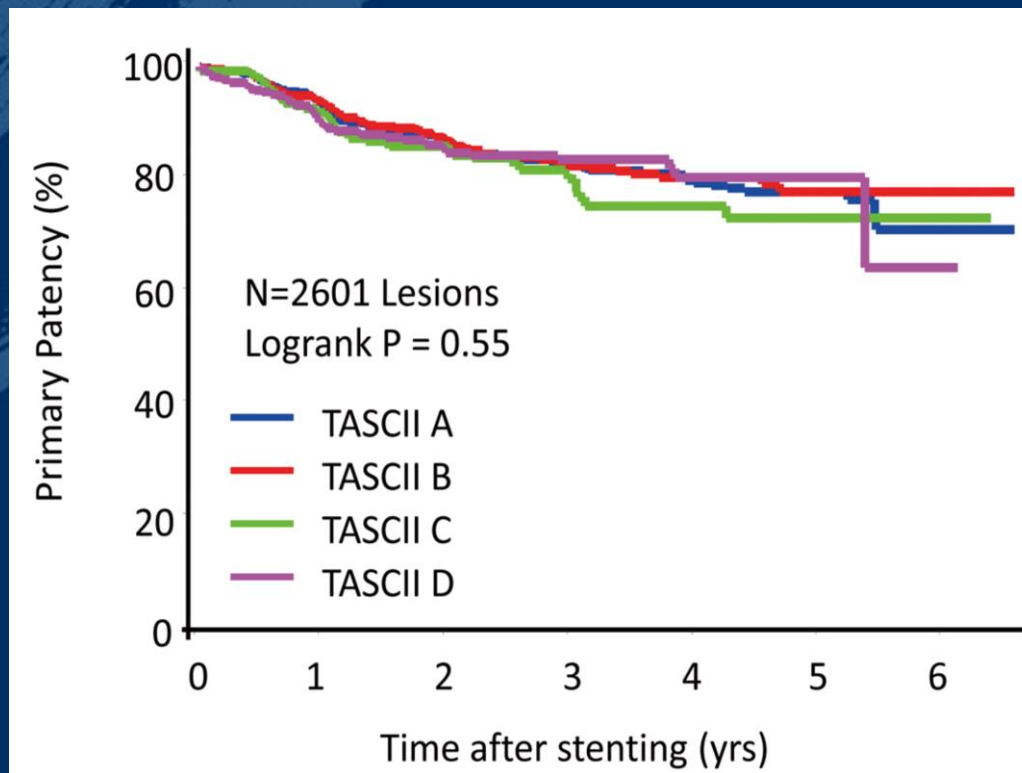
First author	Year	1 year		2 year		3 year		4 year		5 year	
		PP (%)	SP (%)	PP (%)	SP (%)	PP (%)	SP (%)	PP (%)	SP (%)	PP (%)	SP (%)
Nyman	2000	97	100 ^a								
Scheinert	2001	84	88			78	86	76	85	66	80
Ali	2003			84	95 ^b						
Greiner	2003		91 ^a		65 ^a						
Rzucidlo	2003	70	88								
Domanin	2005	70	88								
Lagana	2006	89	100								
Ballzer	2006					90	96				
De Roeck	2006	94	100	89	94	89	94	77	94	77	94
Park	2007	C 94 D 93	C 97 D 94			C 94 D 74	C 97 ^a D 85 ^a			C 78 D 74	C 74 ^a D 85 ^a
Piffaretti	2007	92		86						81	
Bjorses	2008	97	100	88	97	83	95	74	91	65	83
Chang	2008									60	98
Gandini	2008	95	97	93	96	91	94	88	93	86	90
Hans	2008							69	89		
Sixt	2008	C 86 D 85	C 98 D 98								
Sharafuddin	2008							81	94 ^a		
Kashyap	2008	90	97	82	97	74	95				
Moise	2009	85	100			66	90				

J Vasc Surg. 2010;52:1376

Favorable results of EVT for aortoiliac lesions have been reported.



Background



Soga et al. Circ J. 2012;76:2697

Primary patency after successful stenting in aortoiliac lesions does not differ between TASCII lesion categories.



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Background

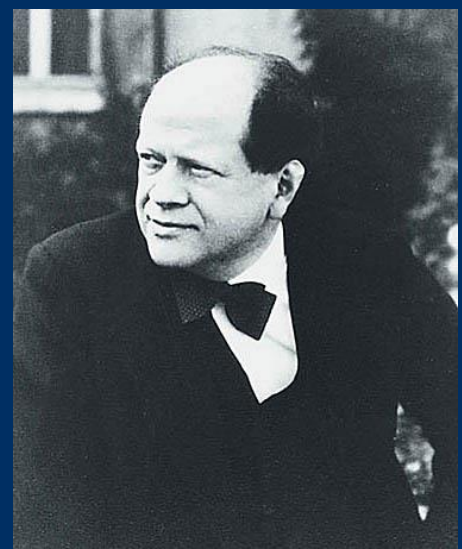
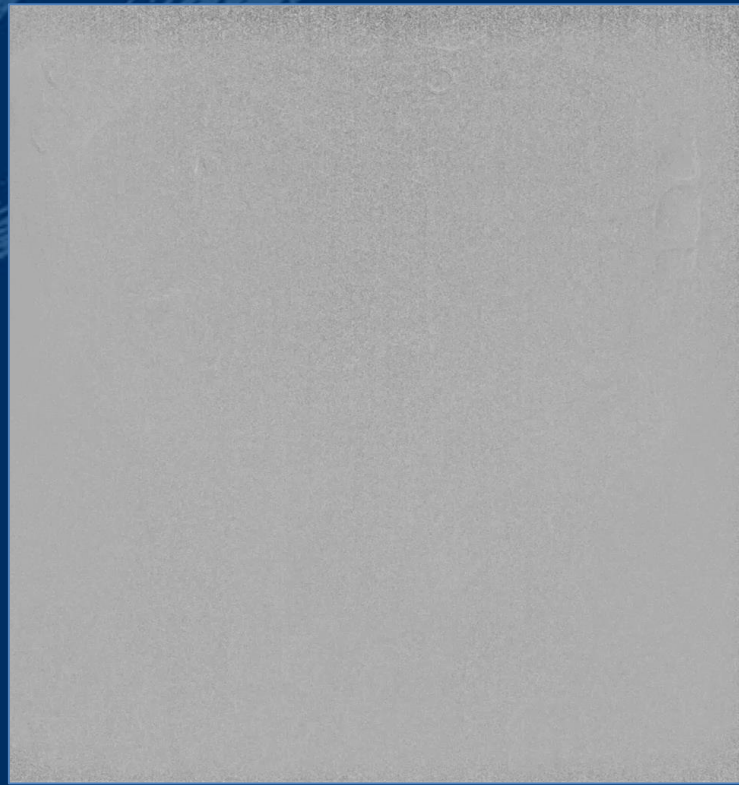
EVT for a complex aortoiliac lesion is still challenging and controversial despite recent progresses in techniques and therapeutic devices.



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Chronic Aortic Occlusion (CAO)

Chronic occlusion of infrarenal abdominal aorta
with or without iliac artery occlusion

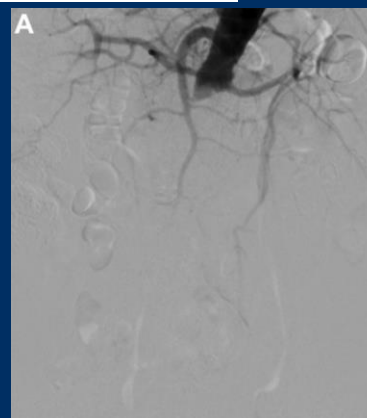
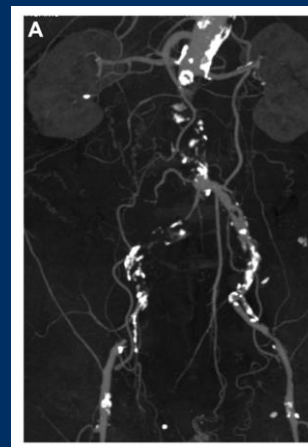
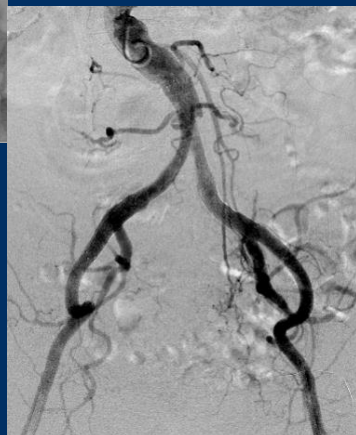
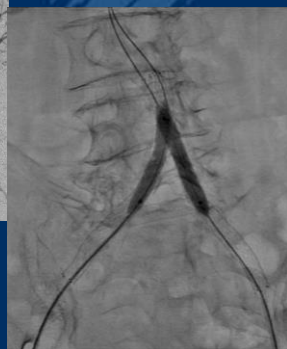
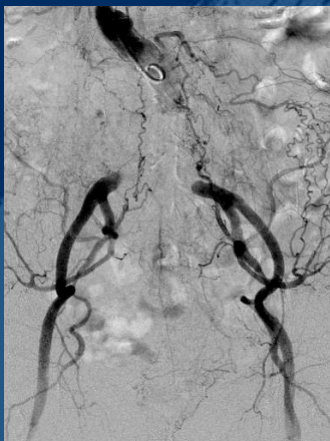


Rene Leriche, 1879-1955



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EVT for CAO





L I N C

Single-center Studies of EVT for CAO

Endovascular management of chronic Infrarenal aortic occlusion

Mireille A, et al.

J Endovasc Ther. 2009;16:84-92

31 patients of CAO,
treated from 2000 to 2005

Procedural success: 29/31 (**93%**)

36 months primary patency: **66%**

36 months secondary patency: **90%**

Outcomes of endovascular treatment of chronic total occlusion of the infrarenal aorta

TH Kim, et al.

J Vasc Surg. 2011;53:1542

49 patients of CAO,
treated from 1995 to 2009

Procedural success: 40/49 (**81.6%**)

36 months primary patency: **80%**

36 months secondary patency: **92%**

Mid-term clinical outcome following endovascular therapy in patients with chronic aortic occlusion

Dohi T, et al.

Cardiovasc Interv Ther. 2013;28:327

25 patients of CAO,
treated from 2005 to 2012

Procedural success: 24/25 (**96%**)

36 months primary patency: **76%**

36 months secondary patency: **94%**



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Purpose

To evaluate the clinical outcomes of EVT for CAO
using multicenter registry data



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Method

- ◆ Multicenter, Retrospective Study
- ◆ 73 consecutive patients who underwent EVT for CAO at 15 centers in Japan from April 2003 to December 2015



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Endpoint

Primary Endpoint

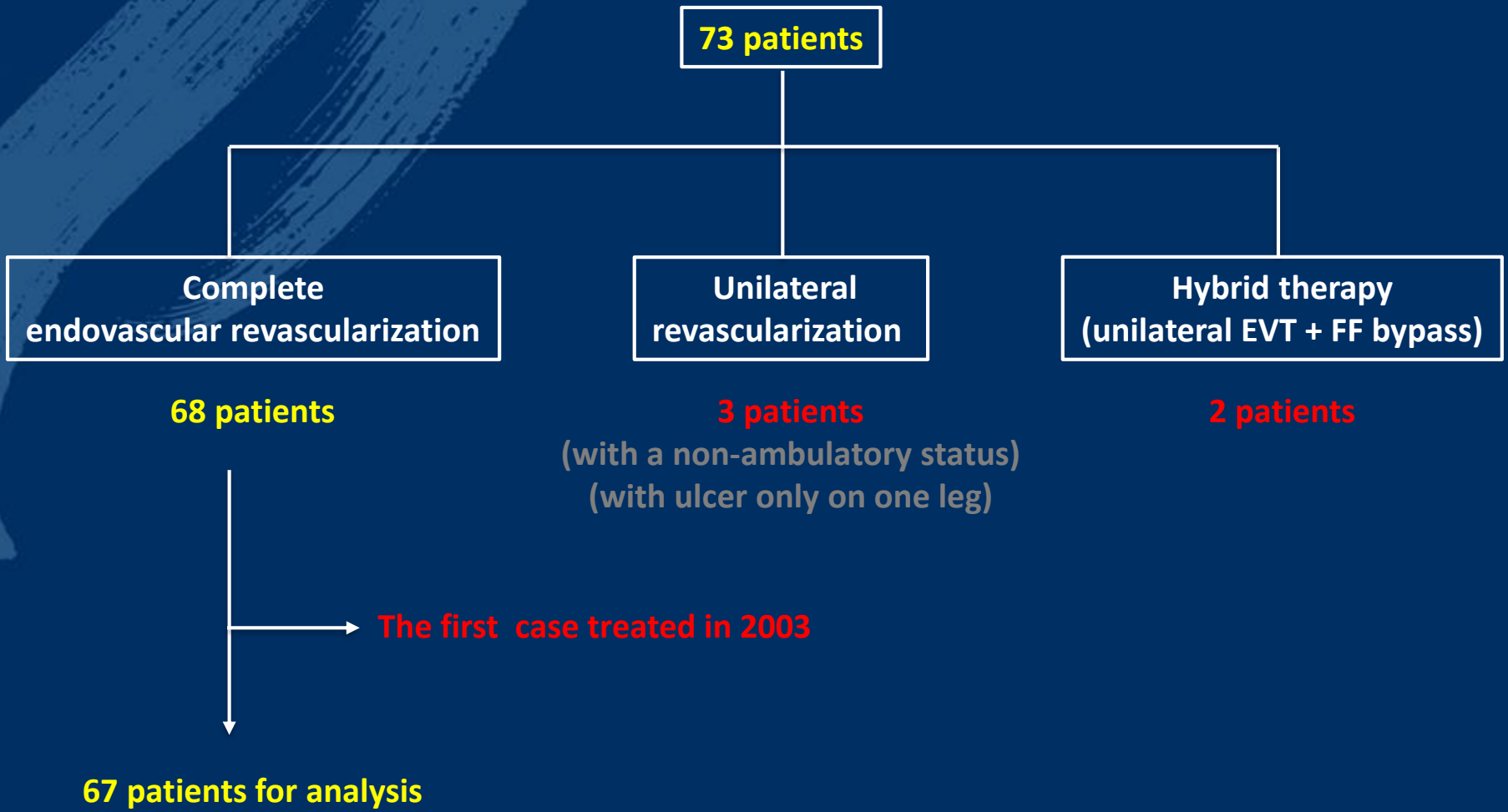
Primary and secondary patency at 12 months after EVT

Secondary Endpoint

Procedural success and safety rates



Revascularization strategy and exclusion of analysis





L I N C

Patient and lower limb characteristics (N=67)

	Mean \pm SD	<u>Rutherford classification</u>	N (%)
Age (years)	70.3 \pm 12.5	1	0 (0)
Body mass index (kg/m ²)	21.4 \pm 3.2	2	6 (9.0)
		3	44 (65.7)
	N (%)	4	9 (13.4)
Male	50 (74.6)	5	6 (9.0)
Coronary artery disease	30 (44.8)	6	2 (3.0)
Cerebrovascular disease	18 (26.9)		
Congestive heart failure	11 (16.4)	<u>ABI before treatment</u>	Mean \pm SD
Hypertension	55 (82.1)	Right	0.46 \pm 0.20
Dyslipidemia	38 (56.7)	Left	0.40 \pm 0.25
Diabetes	25 (37.3)		
Smoking history	49 (73.1)	BUN (mg/dL)	17.8 \pm 9.9
COPD	8 (11.9)	CRE (mg/dL)	1.38 \pm 2.0
CKD (eGFR < 60)	25 (37.3)	Hb (g/dL)	12.8 \pm 2.1
Hemodialysis	5 (7.5)	Ht (%)	38.6 \pm 5.8
		LDL (mg/dL)	104 \pm 49
		HDL (mg/dL)	49.1 \pm 16
		HbA1c (%)	6.31 \pm 1.3

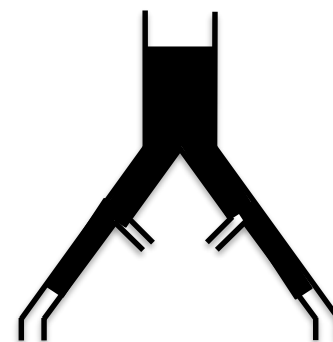


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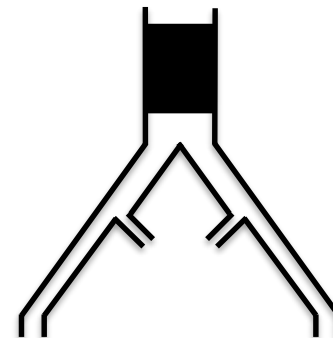
Lesion Characteristics (N=67)

	Mean \pm SD or N (%)
<u>Occlusion pattern</u>	
Aorto-iliac occlusion	56 (83.6)
Isolated aortic occlusion	11 (16.4)
Lesion length (mm)	121 \pm 78.0
<u>Calcification</u>	
None	13 (19.4)
Mild	20 (29.9)
Moderate	16 (23.9)
Severe	18 (26.9)
Presence of FP lesion	23 (34.3)

Aorto-iliac occlusion



Isolated aortic occlusion





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Primary Endpoint

12-month primary patency	90.7% (39/43)
secondary patency	97.7% (42/43)

Secondary Endpoint

Procedural success rate	94.0% (63/67)
Complication rate	4.5% (3/67)



L I N C

Interventional procedure (N=67)

	N (%)		N (%) or Mean \pm SD
<u>Procedure success</u>		<u>Wiring strategy</u>	
Success	63 (94.0)	Intraluminal	51 (76.1)
Failure	4 (6.0)	Subintimal	16 (23.9)
Guidewire crossing failure	4	IVUS usage	59 (88.1)
<u>Periprocedural complication</u>	3 (4.5)	Number of stents (per case)	3.2 \pm 1.4
Stroke	1	<u>Total number of stents</u>	201
Distal embolism	1	Self-expandable stent	181 (90.0)
Access site complication	1	Balloon-expandable stent	20 (10.0)
	Mean \pm SD	<u>Distal protection</u>	5 (7.5)
Contrast medium (ml)	155 \pm 79.6	Occlusion balloon-guiding cathe.	5
Fluoro dose (Gy)	1.4 \pm 1.3		

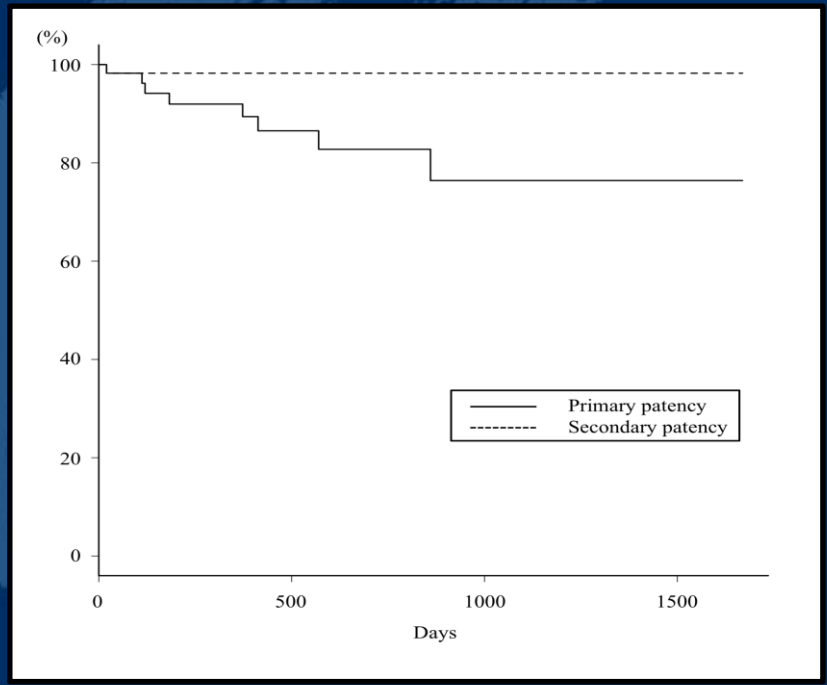


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Clinical follow up after Successful EVT (N=63)

12-month primary patency (N=43) 90.7 (39)
 12-month secondary patency (N=43) 97.7 (42)

Follow up period (month) Mean ± SD
 17.8 ± 13.9



	N (%)
<u>Restenosis/reocclusion</u>	8 (12.7)
<u>TLR</u>	7 (11.1)
Balloon angioplasty	2
Stent implantation	4
Fogarty catheter thrombectomy	1
<u>Death</u>	8 (11.8)
Malignancy	3
Sudden death	1
Heart failure	1
Sepsis	1
Ischemic colitis	1
Unknown	1
<u>Amputation</u>	1 (1.8)
Toe amputation	1
<u>Bleeding</u>	3 (4.4)
Intestinal hemorrhage	1
Chronic subdural hematoma	1
Other	1



Various parameters between the ISR and non-ISR group

	<u>ISR (n=8)</u>	<u>non-ISR (n=55)</u>	P
Female gender (%)	37.5	23.6	0.328
Age (years)	68.1 ± 14.9	69.9 ± 12.1	0.495
Diabetes (%)	25.0	41.8	0.265
CKD (%)	25.0	38.2	0.432
CLI before treatment	12.5	27.3	0.970
Aorto-iliac occlusion (%)	87.5	81.8	0.503
Lesion length (mm)	118 ± 74	119 ± 80	0.662
Moderate or severe calcification	50.0	47.3	0.805
FP lesion	25.0	32.7	0.831
IVUS usage rate	100	87.3	0.994



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Summary

- ◆ 67 patients who underwent EVT for CAO
- ◆ 12-months primary and secondary patency rates were 90.7 and 97.7% respectively.
- ◆ Procedural success and complication rates were 94.0 and 4.5% respectively.



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Limitation

1. Non-randomized, retrospective
2. Small number
3. Short follow-up period



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Conclusion

EVT for CAO could be performed safely with high success rate, and its clinical outcome was acceptable in spite of lesion complexity.

EVT for CAO can be alternative to surgery, especially in elderly patients with severe comorbidities.



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- a multicenter retrospective study -

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