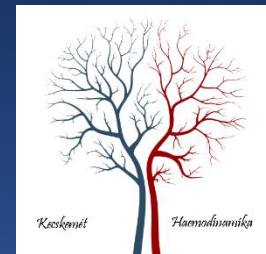


Comparison of transradial and transfemoral approach for carotid artery stenting: RADCAR study (RADial access for CARotide artery stenting)

Zoltán Ruzsa MD PhD et al.



TCT 2013



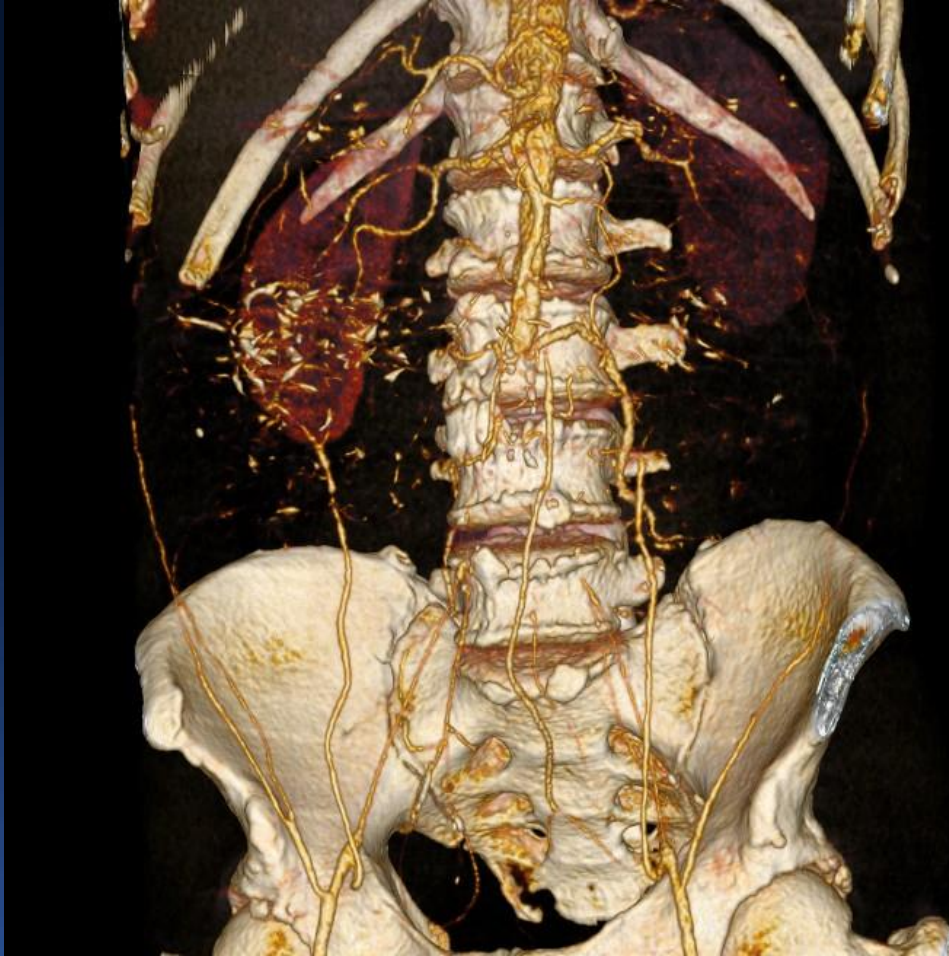
Disclosure Statement of Financial Interest

I, Zoltán Ruzsa MD. PhD.

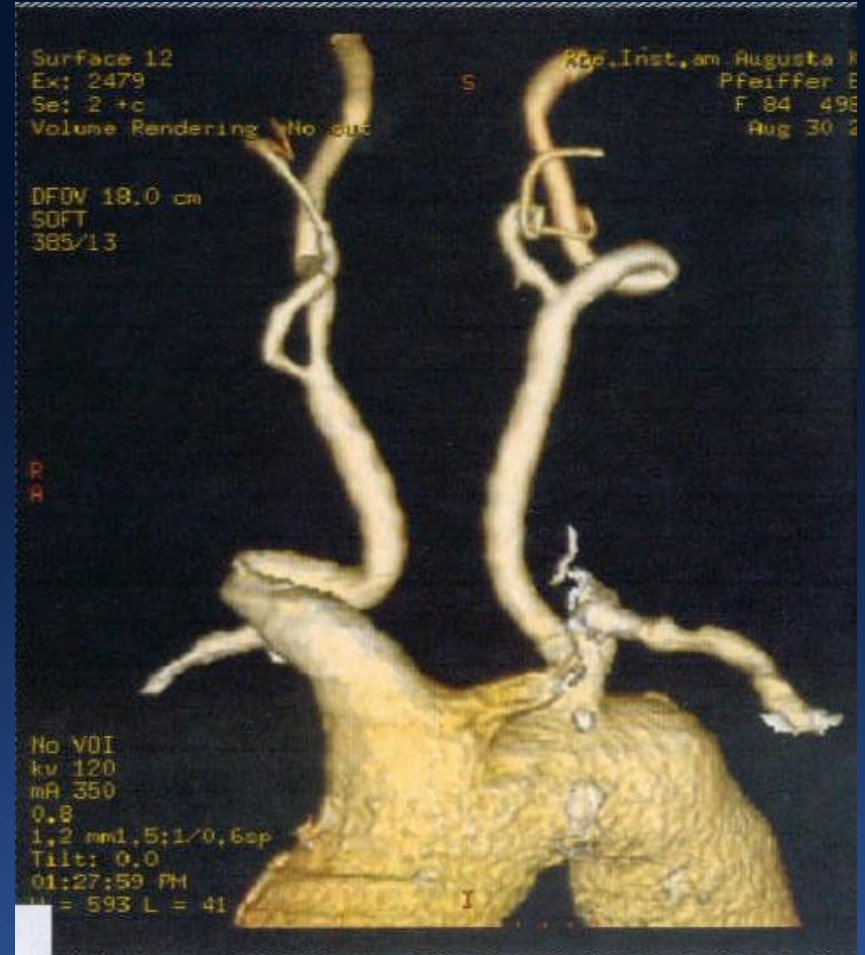
DO NOT have a financial interest /arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

Background

Severe access ¹



Cannulation problems ^{3,4}



1. Yoo BS. *Catheter Cardiovasc Interv.* 2002 Jun;56(2):243-5.

2. Gan HW. *Catheter Cardiovasc Interv.* 2010 Mar 1;75(4):540-3.

3. Shaw JA. *Catheter Cardiovasc Interv.* 2003 Dec;60(4):566-9.

Background (Transradial CAS)

	Publ. year	Study	Patient No	Success (%)	Cross over (%)	Asympt RAO (n, %)	Major vasc complication	MACCE
Pinter et al. ¹	2007	Pilot	20	90	10	5	0	0
Folmar J et al. ²	2007	Pilot	42	83	?	0	0	2.3
Patel et al. ³	2010	Pilot	20	80	?	0	0	5
Bakoyiannis C et al. ⁴	2010	Pilot	9	100	0	0	0	0
Mendiz Oa et al ⁵	2011	Pilot	79	98.8	?	0	0	2
Ruzsa et al. ⁶	2012	Pilot	68	97.1	2.85	2.94	1.4	1.4
Etxegoien N et al ⁷	2013	Pilot	382	91	?	6	0	0.6

1. *Pinter et al. J Vasc Surg. 2007 Jun;45(6):1136-41.*
2. *Folmar J et al. Catheter Cardiovasc Interv. 2007 Feb 15;69(3):355-61.*
3. *Patel et al. Catheter Cardiovasc Interv. 2010 Feb 1;75(2):268-75.*
4. *Bakoyiannis C et al. Int Angiol. 2010 Feb;29(1):41-6.*
5. *Mendiz OA. Vasc Endovascular Surg. 2011 Aug;45(6):499-503.*
6. *Ruzsa et al. Cardiologia Hungarica. 2012; 42 : 6-X*
7. *Etxegoien N. Catheter Cardiovasc Interv. 2012 Dec 1;80(7):1081-7.*

Methods

Study population.

- The clinical and angiographic outcomes of 260 consecutive patients with high risk for carotid endarterectomy (9) treated by CAS with cerebral protection were evaluated in a prospective randomized multicenter study between 2010 and 2012.
- Patients were randomized to TR (n =130) or TF (n =130) groups.

Endpoints

The following parameters were applied to evaluate the potential advantages of TR access:

- Primary endpoint: MACCE, rate of major and minor access site complications.
- Secondary endpoints: angiographic outcome of the CAS, and consumption of the angioplasty equipment, fluoroscopy time and X Ray dose, procedural time, cross over to another puncture site and hospitalisation days.

Inclusion and exclusion criteria.

- *Inclusion criteria* were: (1) Symptomatic (history of stroke or transient ischemic attack within 6 months) internal carotid artery stenosis (>70%) determined by magnetic resonance imaging or computer tomography and (2) critical asymptomatic (80%) ICA stenosis.
- *Exclusion criteria* were: (1) history of acute or recent stroke (<2 months), myocardial infarction, and surgery or trauma within the preceding 2 months, (2) unconsciousness or unwillingness to undergo the procedure, (3) known subclavian or brachiocephalic artery stenosis, (4) known iliac or common femoral stenosis, (5) contraindications of the transradial access (Negative Allen test, non-palpable radial artery).

Study Flow chart

305 surgically high risk patients referred CAS

Inclusion criteria

- 1. Asymptomatic critical ICA stenosis (>80%) months**
- 2. Symptomatic significant ICA stenosis (>70%) the**

Exclusion criteria

- 1. History of stroke, AMI and surgery within 2 months**
- 2. Unconsciousness and unwillingness to undergo procedure**
- 3. Known subclavian or anonym artery stenosis**
- 4. Known iliac and common femoral artery stenosis**
- 5. Contraindication of the radial artery puncture**

Excluded 5 patients

Randomized and enrolled 260 patients in the study

130 patients for transradial CAS

130 patients for transfemoral CAS

Cross over

117 (90%) patients performed from the primary access

2 patients (1.5%) performed from secondary access

13 (10%) patients performed from secondary access

128 (98.5%) patients performed from the primary access

Right sided lesion

Aortography with 15 ml contrast

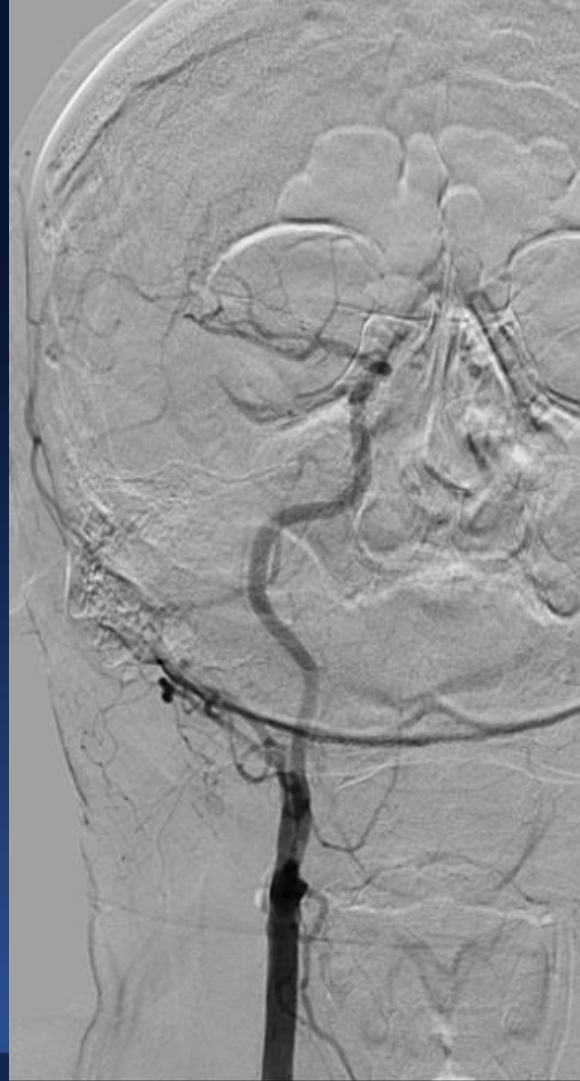


Pulling back and rotating the Simmons catheter

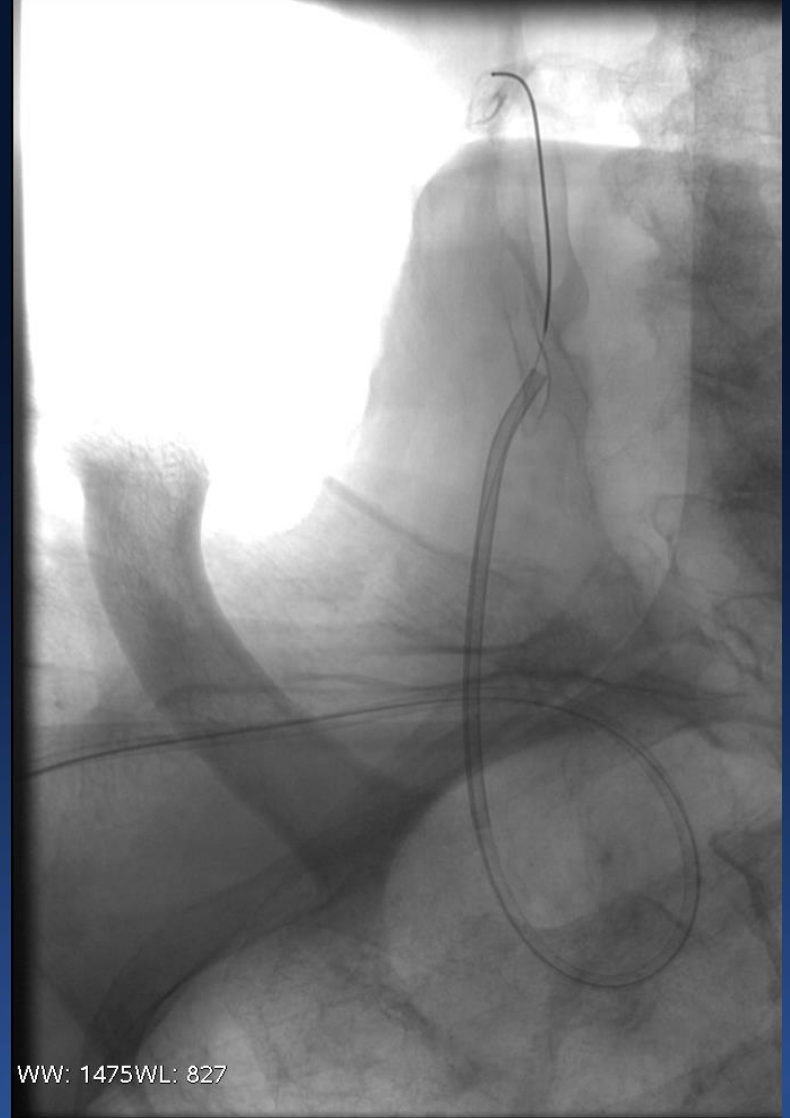
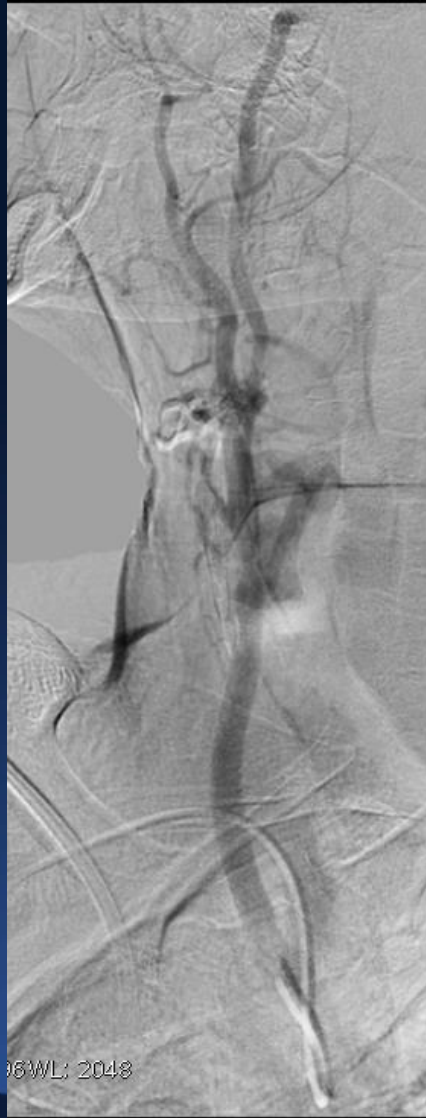


Right sided lesion

Selective angiography in AP and LAO90 view



Right sided lesion



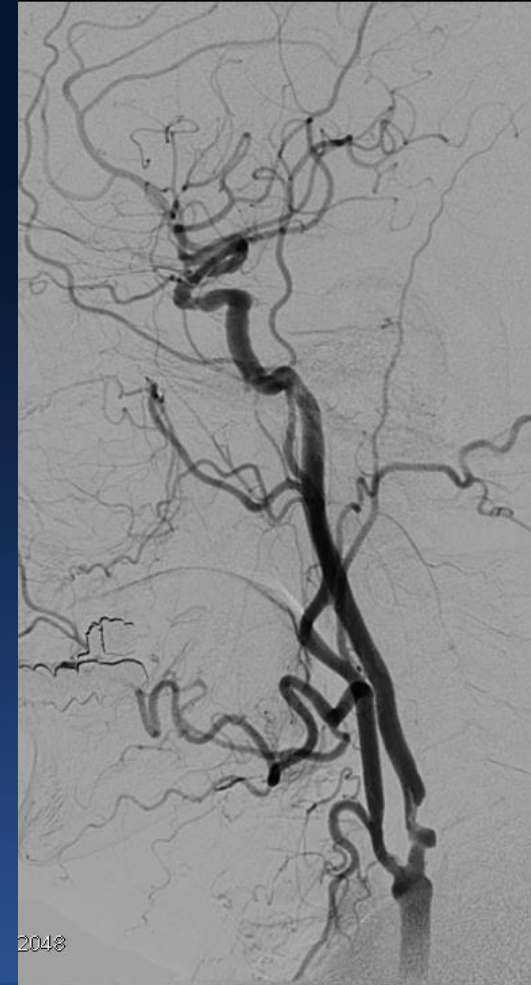
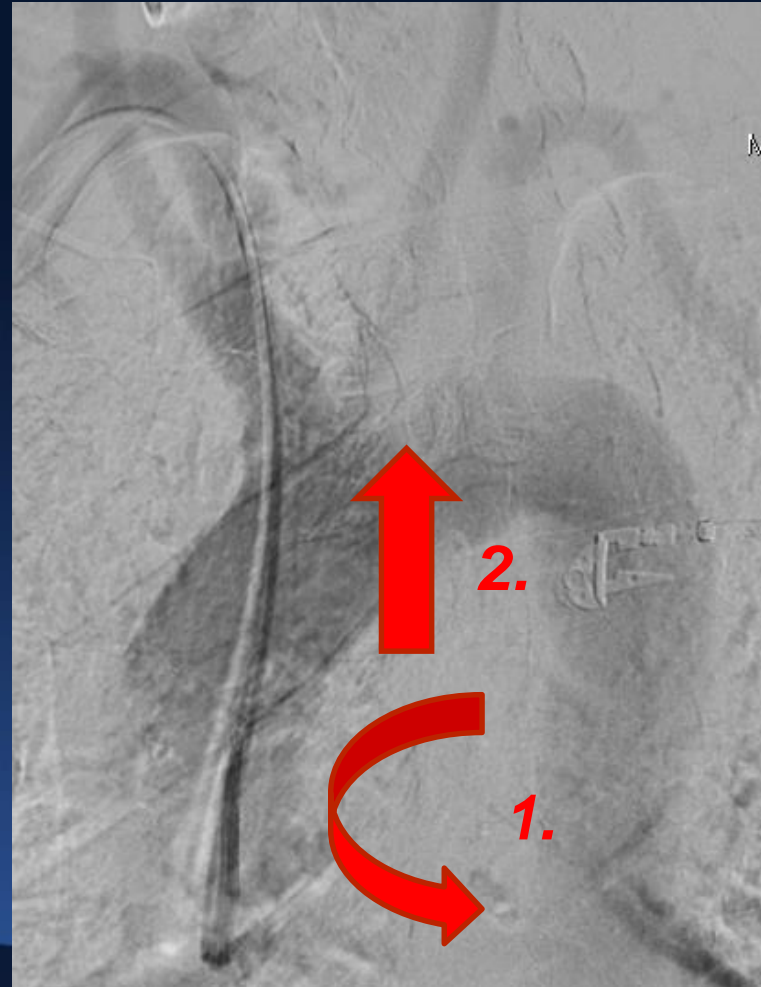
Right sided lesion



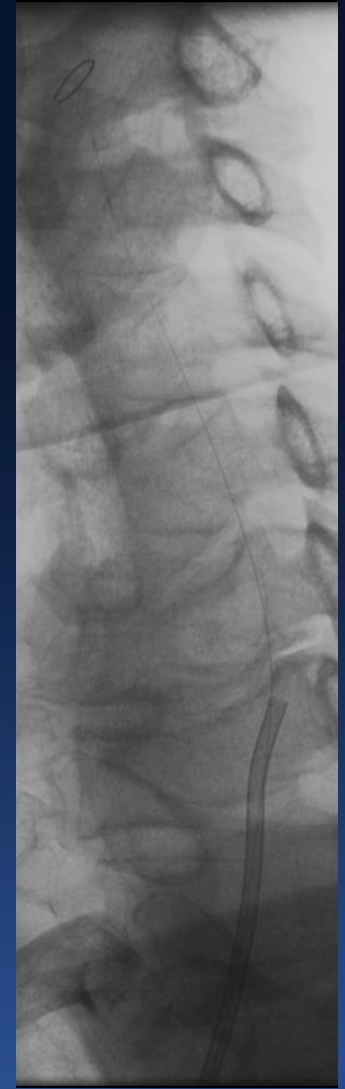
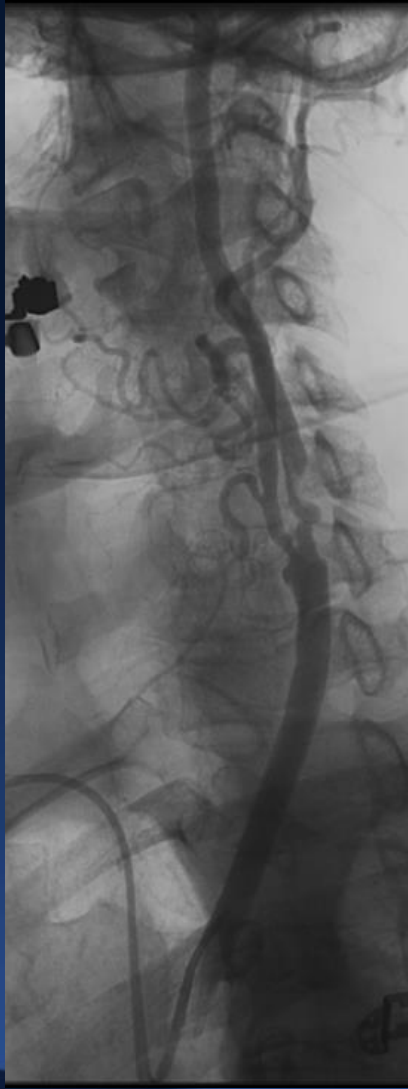
Left sided lesion

Aortography with 15 ml contrast

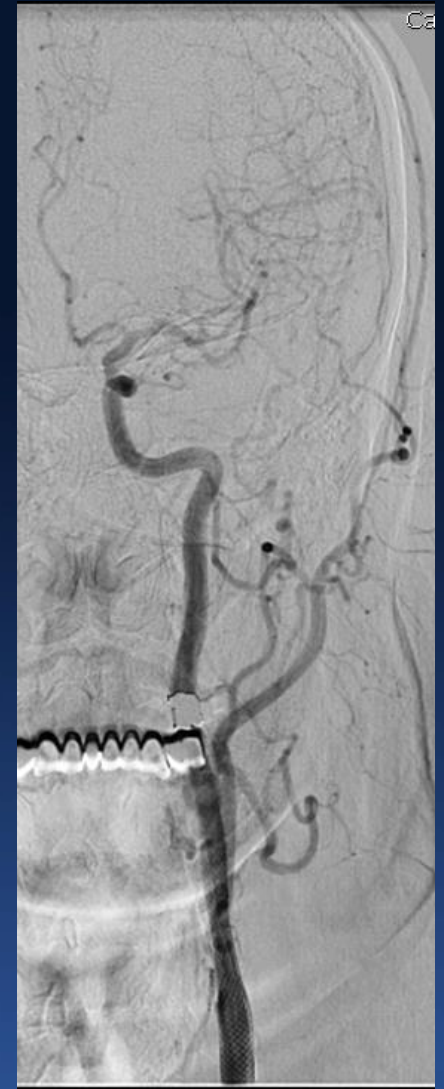
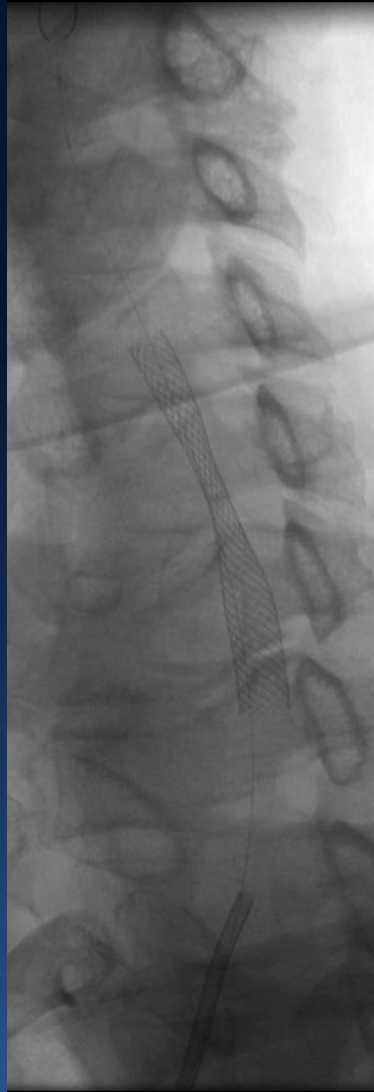
Selective angiography in AP and LAO90 view



Left sided lesion



Left sided lesion



Demographic and clinical data of all study patients

	Radial group (n=130)	Femoral group (n=130)	P value
Age	66.8±8.9	66.7±10.2	0.856
Male (%)	60.8	65.4	0.441
Hypertension (%)	77.7	88.5	0.021
Hyperlipidaemia (%)	56.2	47.7	0.172
Diabetes mellitus (%)	36.2	36.9	0.898
Obesity (%)	14.6	34.6	0.0003
Smoker (%)	28.5	26.9	0.889
Peripheral artery disease (%)	13.9	13.8	1.000
Coronary artery disease (%)	24.6	24.6	0.776
Positive family history (%)	6.9	9.2	0.495
Dialysis (%)	6.2	3.1	0.237

Angiographic data

	Radial group (n=117)	Femoral group (n=128)	p value
Aortic arch morphology			
Arch type I. n (%)	79 (67.5)	108 (84.4)	0.002
Arch type II-III n (%)	38 (32.5)	20 (15.6)	0.073
Stenosis localisation			
- Left sided n (%)	50 (42.7)	75 (58.6)	0.131
- Right sided n (%)	67 (57.3)	53 (41.4)	
Reference diameter (ICA) (mm)	5.7±0.9	5.7±0.9	0.854
Stenosis diameter (%)	81.9	84.1	0.286

Procedural data

	Radial group (n=117)	Femoral group (n=128)	p value
Successful puncture in all patients n (%)	128 (98.5)	130 (100.0)	0.156
Successful cannulation n (%)	119 (91.5)	129 (99.2)	0.003
Successful procedure from primary access n (%)	117 (90.0)	128 (98.5)	0.003
Cross over n (%)	10.0	1.5	0.003
Puncture time (sec)	30±48	25±19	0.347
Cannulation time (sec)	118±152	93±95	0.141
Procedure time (sec)	1744±742	1665±744	0.409
X Ray dose (mGy)	223±138	182±106	0.008
Fluoroscopy time (sec)	613±289	579±285	0.359
Contrast volume (ml)	117.9±39.3	110.1±36.3	0.111
Hospitalization days	1.17±0.40	1.25±0.45	0.006

Consumption of devices

Diagnostic catheter / procedure (%)	122 (104.3)	110 (85.9)	0.011
Guide catheter / procedure (%)	108 (92.3)	77 (60.2)	<0.001
Guiding sheath (%)	9 (7.7)	51 (39.8)	<0.001
Buddy wire (%)	45 (38.5)	69 (53.9)	0.016
Balloon / procedure (%)	128 (109.4)	147 (114.8)	0.355
Stent used / procedure (%)	112 (95.7)	126 (98.4)	0.204

MACCE (Major Adverse Cerebral and Cardiac Events)

	Radial group (n=117)	Femoral group (n=128)	p value
MACCE n (%)	1 (0.9)	1 (0.8)	0.949
- Death	1 (0.9)	0 (0.0)	0.295
- Myocardial infarction	0 (0.0)	0 (0.0)	1.000
- Reintervention	0 (0.0)	0 (0.0)	1.000
- Stroke	1 (0.9)	1 (0.8)	0.949

Vascular complications

Minor n (%)	9 (7.7)	6 (4.7)	0.327
- Spasm	0 (0.0)	0 (0.0)	1.000
- Haematoma	1 (0.9)	6 (4.7)	0.072
- Asymptomatic RAO	8 (6.8)	0 (0.0)	0.003
- Other	0 (0.0)	0 (0.0)	1.000
Major n (%)	1 (0.9)	1 (0.8)	0.949
- Symptomatic RAO	1 (0.9)	0 (0.0)	0.295
- Bleeding and compartment syndrome	0 (0.0)	1 (0.8)	0.338
- Other	0 (0.0)	0 (0.0)	1.000
Total vascular complication n (%)	10 (8.6)	7 (5.5)	0.344

Conclusion

- Carotid artery stenting with cerebral protection devices can be safely and effectively performed using radial access with acceptable morbidity and high technical success.
- In severe PAD, tortuouse iliac artery and aortic arch abnormalities (Bovine arch, Arch II-III) the transradial angioplasty can be better than transfemoral angioplasty
- There are no differences in total procedure duration, fluoroscopy time between the two approaches, but the radiation dose is significantly higher in the radial group and the hospitalisation is shorter with the transradial access.

Case 1.- Bovine arch direct cannulation

Access: JR 7F

Guiding: 7F JR3,5

Guidewire: Filter wire

Stent: Carotis Wallstent 7x30 mm

Balloon: Sterling 4x20 and 6x20 mm



Case 2.-Loop technique

Access: 7F

Guiding: 7F XF40

Guidewire: Filter wire

Stent: Carotis Wallstent 7x30 mm

Balloon: Sterling 5x20 mm

