Transcarotid As An Alternative Access Route For Trancatheter Aortic Valve Implantation

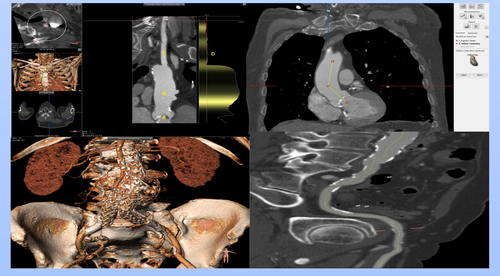
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BACKGROUND: Transfemoral (TF) is the most commonly used access for trancathehter aortic valve implantation (TAVI) due to the best safety profile and favorable long-term outcomes. Alternative access must be used in 15-20% TAVI candidates due to significant peripheral artery disease (PAD) and significant descending aortic disease (1-3) . TAVI procedure through the common carotid artery (CCA) seems to be a promising alternative approach, for high-vascular-risk patients (4-7)

METHODS: The approach was selected by a multidisciplinary (cardiologists and cardiac surgeons) **„Heart Team"** after analyzing preoperative coronary angiography, transthoracic echocardiography (TTE) and Multi-Slices Computed Tomography MSCT of the peripheral arteries and aorta. Patients with the following conditions were qualified to the transcarotid access:

- severe PAD (stenotic, heavily calcified)
- tortuous or small diameter < 6 mm iliofemoral arteries
- descending and abdominal aortic disease (an aneurysm, thrombus, stentgraft)



MSCT analysis of accesses and aorta prior to TAVI procedure

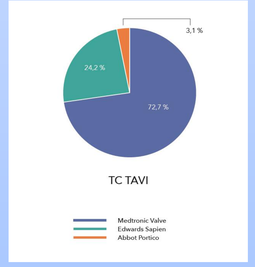
RESULTS: Thirty-three TC TAVI procedures were performed in our hospital from September 2017 to November 2019. The results were presented according to guidelines from Valve Academic Research Consortium – 2 (VARC-2) consensus (8) There were one in-hospital death no related to access (rupture aortic ring) and one cerebrovascular complication (TIA).

Patient characteristic

Variables	TC-TAVI (n=33)
Age (years)	77 (72-85)
Male	17 (51.5)
BMI (kg/m²)	28 (24-31.5)
EuroSCORE II (%)	6.0 (4.8-10.7)
Cardiac comorbidities	
Prior MI	11 (33.3)
Prior Cardiac operation	10 (30.3)
Prior PCI	14 (42.4)
Atrial fibrillation	9 (27.3)
Pacemaker	1 (3.0)
Hypertension	33 (100.0)
Other comorbidities	
Dyslipidemia	24 (72.7)
Diabetes mellitus	19 (57.6)
COPD	8 (24.2)
PAD	12 (36.4)
Prior stroke	1 (3.0)
Prior TIA	0 (0)
TNT level (ng/ml)	0.021 (0.01-0.03)
Creatinine level (mg/dl)	1.08 (0.87-1.28)
Hemoglobin level (g/l)	12.9 (11.4-14.3)

Procedural outcomes

Variables	TC-TAVI (n=33)
Perioperative	
Device success	32(96.9)
Procedural time (min)	65 (60-80)
Prosthesis dislocation	0 (0)
General anaesthesia	33 (100)
ViV procedure	0 (0)
Balloon aortic predilatation	4 (12.1)
Balloon aortic postdilatation	7 (21.2)
Coronary oclusion	0 (0)
Conversion to SAVR	0 (0)
IABP	0 (0)
Inotropic drugs	6 (18.2)
Temporary pacemaker	9 (27.3)
Procedural mortality	**1 (3)**



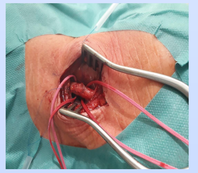
Types of valve prostheses used during TC-TAVI

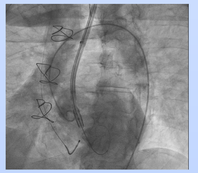
BMI: body mass index, NYHA: New York Heart Association, COPD: chronic obstructive pulmonary disease, PAD: peripheral arterial disease, MI: myocardial infarction, PCI: percutaneus coronary intervention, TIA: Transient Ischemic Attack, TNT: troponin T level, VIV: valve in valve procedure, SAVR: surgical valve replacement, IABP: intra-aortic balloon pump, ICU: intensive care unit.

The procedural success rate defined as the implantation of the valve with no coronary obstruction and less than moderate paravalvular leak (PVL) was 94%. Parameters of regional cerebral oximetry were symmetrical on the implantation and opposite side in all cases and only during rapid ventricular pacing transiently decreased below the value of 50% (significantly lower on the implantation side)

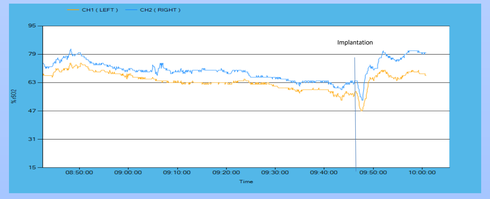
Procedural outcomes

Variables	TC-TAVI (n=33)
Postoperative	
Myocardial infarction	1 (3)
Life-threatening bleeding	0 (0)
TIA	1 (3.0)
Stroke	0 (0)
Tamponade	1 (3.0)
Major vascular complication	0 (0)
Mechanical ventilation time (minutes)	240 (90-390)
New dialysis	0 (0)
ICU stay (days)	2 (2-3)
Hospital stay (days)	6 (6-7)
Blood transfusion	3 (9.1)
New atrial fibrillation	2 (6,3)
New pacemaker implantation	5 (15,1)
TNT level (ng/ml)	0.138 (0.11-0.22)
Creatinine level (mg/dl)	1.05 (0.86-1.35)
Hemoglobin level (g/dl)	10.7 (9.8-11.9)
30-day mortality	**2 (6.06)**
Wound infection	0 (0)

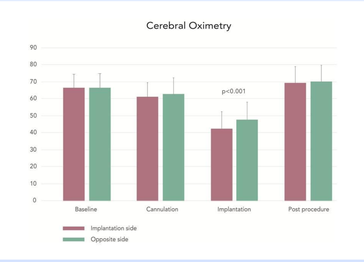


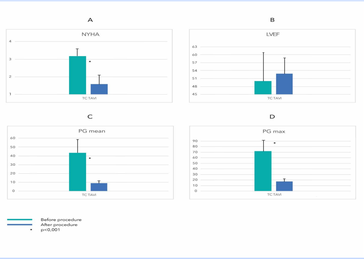






Measurement of cerebral oximetry during the TC TAVI procedure





CONCLUSIONS: Our results show that TC approach is feasible and safe. With proper preprocedural imaging and planning as well as patients selection TC access became our first-choice alternative approach for TAVI.

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