

# UPDATE ON VALVE AND LV DAMAGE FOLLOWING ENDOVASCULAR REPAIRS

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Background

Methods

Results

Conclusion



Thoracic endovascular aortic repair (TEVAR) is the treatment of choice for descending thoracic aortic pathologies.



Preclinical studies have reported on acute stiffening of the aorta following TEVAR, resulting in acute elevated pulse pressure, hypertension, and heart failure

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To date, three clinical studies have suggested negative cardiac remodeling following TEVAR ran Bakel et al. 2018, Vallerio et al. 2019, Kreibich et al. 2019



n=8



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#### Single center: 2005-2018 519 TEVAR procedures performed

462 patients without pre- and post-TEVAR echocardiography

57 patients with pre- and post-TEVAR echocardiography

26 patients with previous replacement of the ascending aorta and/or the aortic arch and/or the descending aorta

#### **Study population**

31 patients without previous thoracic aortic intervention





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Patient characteristics including information on antihypertensive medications were collected and analyzed

Pre- and post-TEVAR echocardiographic data were collected and compared

Aortic details were measured in multiplanar reconstruction

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#### Patient characteristics

Background	Methods	Results	Conclusion
Patient	characteristics		
			N=31
Age (ye	ars)		69±9
Male			22 (71)
History	of smoking		14 (45)
Hyperlip	pidemia		15 (48)
Hyperte	nsion		26 (74)
IDDM2			7 (23)
COPD			2 (6)
History	of stroke		2 (6)
Coronal	ry artery disease		11 (35)
Chronic	renal impairment		5 (16)
Values a insulin de	re n (%) or mean ± standard deviation. COP ependent diabetes mellitus Type 2;	D, chronic obstructive pulmonary disea	ase; IDDM2,



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### **TEVAR** details

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#### **TEVAR details**

	N=31
Number of stent-grafts used	1±1
1 stent-graft	22 (71)
2 stent-grafts	7 (23)
3 stent-grafts	2 (6)
Proximal landing zone	
Zone 1	2 (6)
Zone 2	7 (23)
Zone 3	12 (39)
Zone 4	10 (32)
Proximal stent-graft diameter (mm)	29±4
Most distal stent-graft diameter (mm)	27±7
Distance covered (mm)	163±66
Values are n (%) or mean ± standard deviation.	

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#### **TEVAR outcome**

	N=31
Acute coronary syndrome	0 (0)
Stroke	1 (3)
Temporary spinal cord injury	3 (10)
Permanent spinal cord injury	1 (3)
Visceral malperfusion	0 (0)
Acute renal failure	1 (3)
In hospital death	0 (0)
Death during follow-up	4 (13)
Follow-up time (years)	2±4
Time to echocardiography (years)	2±2

Values are n (%) or or mean ± standard deviation.

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#### Antihypertensive medication

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#### Antihypertensive medication

	Pre-TEVAR	Post-TEVAR	р
ARBs	8 (26)	7 (23)	1.000
Beta blocker	19 (61)	27 (87)	0.040
ACE inhibitor	12 (39)	16 (52)	0.444
ССВ	15 (48)	23 (74)	0.067

Values are n (%).

ACE, angiotensin-converting-enzyme; ARBs, angiotensin II receptor blockers; CCB, calcium channel blockers

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#### Antihypertensive medication

Background Methods Results Conclusion p=0.037 35 Antihypertensive medication 30 Pre-TEVAR Post-TEVAR р 25 of patients ARBs 8 (26) 7 (23) 1.000 20 **Beta blocker** 19 (61) 27 (87) 0.040 **Number** 15 10 ACE inhibitor 12 (39) 16 (52) 0.444 CCB 15 (48) 23 (74) 0.067 7 10 Values are n (%). ACE, angiotensin-converting-enzyme; ARBs, angiotensin II receptor 5 blockers; CCB, calcium channel blockers 0 pre-TEVAR post-TEVAR Mono-Therapy Duo-Therapy Tripple-Therapy

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Transthoracic echocardiography							
N=31	Pre-TEVAR	Post-TEVAR	р				
Ejection fraction (%)	54±6	51±7	0.026				
TAPSE (mm)	24±6	20±6	0.028				
Aortic root diameter	35±4	36±6	0.937				
E/E' medial	11±5	11±4	0.925				
E/E' lateral	9±5	8±3	0.673				
LVPWd (mm)	11±2	11±2	0.891				
LVSd (mm)	11±3	12±2	0.726				
LVEDD (mm)	49±11	51±9	0.779				
LV mass (g)	219±84	237±102	0.747				

Values are n (%) or mean ± standard deviation.

TAPSE, tricuspid annular plane systolic excursion; LV, left ventricular; LVPWd, LV posterior wall thickness at end-diastole; LVSd, Interventricular septal thickness at end-diastole; LVEDD, LV enddiastolic dimenson

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LVPWd (mm)

LVEDD (mm)

LV mass (g)

LVSd (mm)

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11±2

12±2

51+9

237+102

Results

р

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TAPSE



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Growing data suggest negative cardiac remodelling with a decrease in left and right ventricular function following TEVAR



Cardiac remodelling occurs despite a significant increase in oral antihypertensive medication



The impact of stiffer endovascular grafts compared to the native aortic wall should be considered by endovascular specialists and manufactures

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