Endovascular treatment of severely diseased high risk carotid artery lesion in patient with severe aortic valve stenosis before valve repair

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Disclosure

Speaker’s name:

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I have the following potential conflicts of interest to report:

- Lecture honoraria (Penumbra, Inc.)
Patient

• A 66 year old lady
• Recent onset of severe dyspnea, chest pain and heart palpitations
• Urgently admitted to ICU
• Serious overall condition

• Previous hospitalizations due to known severe aortic stenosis
• Patient previously refused surgical aortic valve replacement after improving on medical therapy
Clinical history

Severe aortic valve stenosis
Coronary heart disease
Previous myocardial infarction in 2004
Previous PCI’s with stents in 2004
Paroxysmal atrial fibrillation
Chronic heart failure

No history of cerebrovascular disease/events
Lab tests & examinations

NT-pro BNP = 3879.0 ng/ml
Troponin I = 9.49 ng/ml
CK-MB = 29.8 ng/ml
Serum creatinine = 107 μmol/l
Estimated GFR = 48 ml/min

ECG: SR with LHBBB
Chest x-ray: pulmonary congestion
Echocardiography:

- Severe aortic valve stenosis
- Aortic valve area $< 1.0 \text{ cm}^2$; $\text{PG}_{\text{mean}} = 46 \text{ mmHg}$
- Secondary mitral regurgitation, grade III
- Low LV ejection fraction of 28%
- Severe pulmonary hypertension of 65 mmHg
Coronary angiography
Carotid angiography
Treatment strategy?

• Decompensated chronic heart failure due to severe aortic valve stenosis
• Coronary artery disease
• Myocardial infarction (Type 2) secondary to an ischemic imbalance
• Previous Myocardial infarction
• Severe stenosis of ACI sin
  = Patient at high risk for surgery/intervention!
Heart team available in hospital

- Anesthesiologist
- Cardiac surgeon
- Radiologist (+/- intervent.)
- Interventional cardiologist
- Primary cardiologist
- Echo-cardiographer
- Patient
Brain team

- Vascular surgeon
- Interventional radiologist (cardiologist)
- Neurologist

Patient
Multidisciplinary approach

Cardiac surgeon
Interventional cardiologist
Primary cardiologist
Radiologist (+/- intervent. )
Neurologist
Vascular surgeon
Echo-cardiographer
Anesthesiologist

Patient
Treatment strategy proposed

Carotid artery stenting

Balloon dilatation for aortic valve

Surgical aortic valve replacement
Carotid stenting

Left femoral approach

6 Fr sheathless catheter (Cook Flexor Shuttle)

Distal protection with SpiderFX 5.0 mm filter (Covidien Ev3)
Carotid stent

CGuard carotid stent

Self-expanding, Nitinol

Open cell stent platform

MicroNet mesh (pore Ø 150 – 180 µm) for trapping potential emboli against the arterial wall

RX (Rapid Exchange) delivery system
Carotid stenting

Mild predilatation
3.0 x 30 mm

Stent
7.0 x 40 mm

Postdilatation
5.5 x 20 mm
Post carotid stenting

- Excellent angiographic result with patent ECA and no debris or thrombotic material was seen in filter after retrieval.
- Patient was conscious during whole procedure and no neurological symptoms was noticed during or at the end of procedure.
- Neurological examination after procedure in intensive care unit and on following day showed no change neurological status.
Balloon dilatation for AoV

- Patient sedated (without general anesthesia)
- Transthoracic echocardiography control
- Vascular access for aortic balloon catheter through right common femoral artery (12 Fr)
- Pig tail catheter through left common femoral artery (6 Fr)
- Temporary pacemaker in the right ventricle via the right femoral vein
Balloon dilatation for AoV

Balloon inflation, (NUCLEUS) 20 mm x 40 mm
Balloon dilatation for AoV

Transthoracic echocardiography after dilatation:

Aortic valve $\text{PG}_{\text{mean}}$: 46 mmHg $\rightarrow$ 32 mmHg

Aortic regurgitation: grade II
Surgical aortic valve replacement

8 days later patient had conventional aortic valve replacement:

- On pump
- Bioprosthetic valve Hancock 2
- Aortic valve $PG_{\text{mean}}$: $32 \text{ mmHg} \rightarrow 17 \text{ mmHg}$
- Uncomplicated recovery
- Patient discharged from hospital
Recovery

• Uncomplicated recovery
• Good overall neurological and cardiological status
• Patient discharged from hospital 12 days later
• Excellent rehabilitation course
• No adverse events during 3 and 6 months follow-up period
Conclusions

Carotid artery stenting with mesh covered stent yielded excellent clinical and angiographic result for high risk ICA lesion.

Multidisciplinary approach and collaboration among physicians are crucial for exploring all treatment possibilities and providing best care for the patient.
Thank you!