

**Dr. P.P. Mohammed Musthafa**

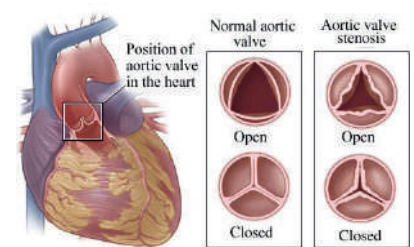
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## TRANSCATHETER AORTIC VALVE IMPLANTATION/ REPLACEMENT (TAVI/TAVR)

### Aortic stenosis

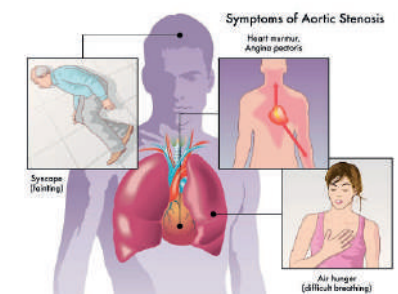
The aortic valve is the heart valve directing the flow of blood from left ventricles to the rest of the body. Aortic stenosis occurs when the valve becomes thickened, hardened, and inflamed. This may happen as a result of rheumatic fever, congenital abnormality or by degeneration in old age. This leads to restricted movement of the valve leaflets and ineffective blood flow to the body and the coronary arteries.



### Symptoms associated with low cardiac output in severe AS are

- Shortness of breath
- Chest pain
- Lightheadedness and fainting
- Fatigue
- syncope
- Pulmonary oedema

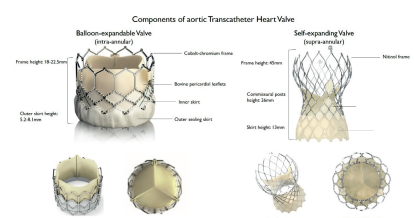
It is important to keep it in mind that some people with aortic stenosis may not have any symptoms until they reach a very advanced stage.



As the aortic valve orifice reduces, it becomes more difficult for the heart to pump blood. To compensate, the heart muscle stretches and thickens eventually leading to Left Ventricular Hypertrophy. Once aortic stenosis become severe and symptoms develop, it is a life threatening situation. At this stage, aortic valve replacement is mandatory to have a normal life. Aortic valve replacement can be done either by surgical or nonsurgical method.

### What does TAVI/TAVR Mean?

In open heart surgery, the diseased valve is removed and replaced by an artificial valve. In TAVI/TAVR, replacing the native valve without removing it using a catheter threaded up the artery, loaded with a valve stent that sits on top of the diseased valve. This can also be performed for stenosis in post-aortic valve surgical replacement with a neo prosthetic valve. Two types of valves commonly used are balloon-expandable and self-expandable.



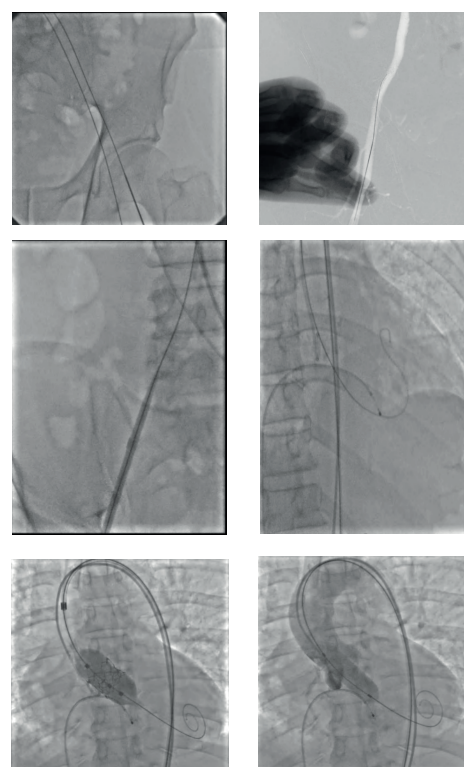
TAVI is a less invasive procedure. The valve is advanced via a transcatheter approach. A catheter is inserted into the artery. The new valve is carefully compressed and taken up this catheter, and inserted on top of the native valve using a special delivery device. Ideal placement of the new valve is determined by angiography and echocardiography. Once the valve is functioning appropriately, the catheter is removed. After that, the femoral puncture site is closed. We have successfully performed more than 25 cases at our centre in the past few years.

## ONE OF OUR CLINICAL EXPERIENCE AT MICC

A 75-year-old male, a known case of severe aortic stenosis, was presented with angina and dyspnea on exertion. The patient had a history of multiple episodes of hospital admissions with decompensated heart failure. He had persistent heart failure symptoms despite being on GDMT. During the course of hospital admission, he was on inotropes and received non-invasive ventilator assistance for low cardiac output. Features of prerenal AKI were also present and were managed conservatively. Considering advanced age with the above clinical presentation, he was a high-risk case for both surgical and transcatheter aortic valve replacement (TAVR). However, due to considerably lower perioperative morbidity with mortality risk of TAVI compared to surgical AVR, the patient was counselled for TAVI, for which he consented.

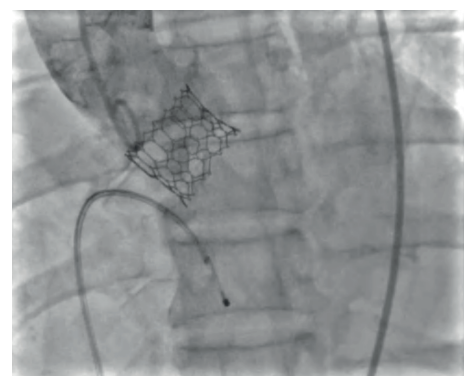
## PROCEDURE:

The procedure was done under general anesthesia. Bilateral femoral arterial accesses were obtained. Right-sided access was utilized for the delivery sheath and introduction of the stented valve. Left-sided anterior access was used for the check coronary angiogram. Left femoral venous access was obtained for temporary pacemaker insertion into the right ventricle. Through the right-sided arterial access, an aortogram was taken. The aortic valve was crossed with an AL catheter and stiff wire. The catheter was then advanced into the left ventricle (LV), and the stiff wire was exchanged with a super stiff wire to support the delivery sheath and valve. Since large arterial sheaths were expected to be used, the arterial access was planned to be closed with perclose proglide sutures to ensure adequate hemostasis. The native aortic valve was then pre-dilated with a non-compliant balloon with RV pacing (to decrease cardiac output and prevent balloon displacement into the aorta). A check coronary angiogram was done to ensure the coronary origin was adequately proximal to the valve position and to avoid coronary occlusion post valve deployment. The valve was then deployed across the aortic valve. A post-procedure check aortogram is performed to assess coronary arteries and aortic regurgitation. The remaining hardware is then removed from the LV after confirming the gradient across the aortic valve. The femoral access is then closed with the perclose device system (sutures that were previously placed in the femoral artery), and hemostasis is achieved. A post-procedure check echocardiogram is always performed to ensure procedural safety and optimal hemodynamics.



## RESULTS

Parameters	Pre TAVR	Post TAVR
Aortic valve area	0.9CM2	1.4cm2
Peak systolic Trans Aortic Valve gradient	86mmHg	20mmHg
Aortic Velocity	4.6m/s	2.2m/s
Mean Aortic Gradient	53m/s	11mmHg
AR Grade		No AR



## FOLLOW UP:

The patient was discharged on day 4 of the post-procedure period, and he was advised to have a review after 1 week. The patient showed symptomatic improvement, and the echocardiogram showed a normally functioning aortic prosthesis. Additionally, severe left ventricular (LV) dysfunction improved to mild LV dysfunction on follow-up. The patient is now leading a normal life.