Case Report

Open heart valve replacement: A case report

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Abstract

Background: Heart valve replacement surgery is a procedure performed to treat heart valve disease, a condition characterized by damage or dysfunction of one or more of the heart's four valves: the aortic valve, mitral valve, tricuspid valve, and pulmonary valve. When a valve becomes diseased, it can cause symptoms such as shortness of breath, chest pain, fatigue, and fainting spells. Severe valve disease can lead to heart failure and other serious complications. Open-heart valve repair/replacement is widely used to treat various valvular pathologies. The development of percutaneous valve replacement technology may pave the way for less invasive treatment options. This study characterized the epidemiology of valvular repair and replacement procedures in the U.S. The Nationwide Inpatient Sample (NIS) was used to identify closed and open heart valvotomy, heart valve replacement, annuloplasty, and percutaneous valvotomy procedures between 1993 and 2007. NIS is an annual survey of ~1,000 hospitals and contains 20% of the U.S. inpatient hospitalizations. The prevalence of these procedures was calculate as a function of age, gender, race, census region, and type of hospital.

Key words: Heart valve replacement surgery; Aortic Valve Replacement (AVR); Mitral Valve Replacement (MVR)

Citation: Muthuselvi, J. Sheetal D. Open heart valve replacement: A case report). Nightingale J. 2025;1(5):14-22.

Academic Editor: Dr. Venkita S. Suresh

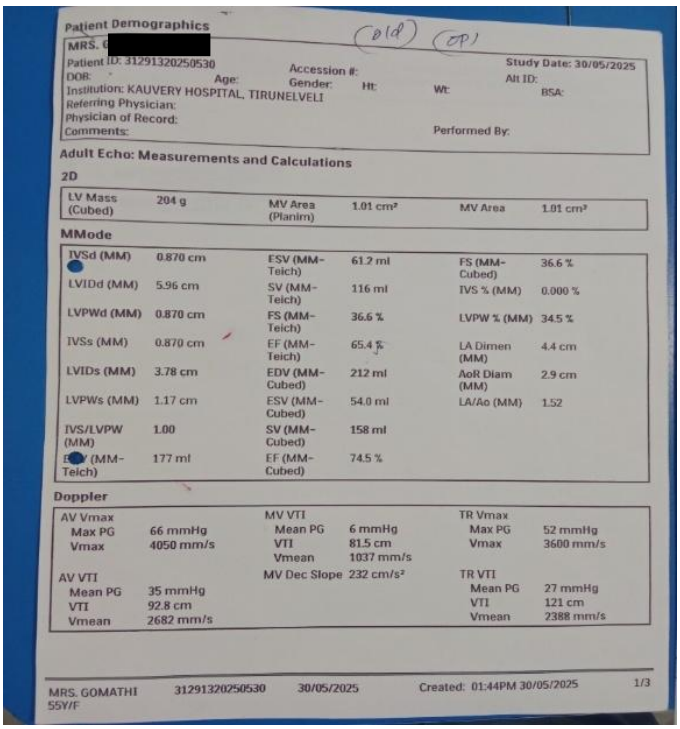
1. Case Presentation

A 58yrs old Female, admitted with Complaints of Dyspnoea while walking On the Stairs, DVR [Double Valve Replacement] surgery. Patient Echo and ECG taken. Patient Known Case off CAD on 2 Weeks before Present.MV and AV Thickened. Mild MS, moderate MR, moderate AS, moderate AR, RA, LV dilated, normal lv systolic function, mild LVH. Then patient diagnosed then plan for double valve replacement.

1.1 On Clinical Assessment

BP	100/50 mm/hg,
HR	78b/mts,
Resp	18b/ mts,
Tem	98.60F
SPo2	99%

1.2 Pre-Operative Investigation



Patient Demographics

MRS. [redacted] (old) (OP)

Patient ID: 31291320250530 Accession #: Study Date: 30/05/2025
DOB: Age: Gender: Ht: Wt: Alt ID: BSA:
Institution: KAUVERY HOSPITAL, TIRUNELVELI
Referring Physician:
Physician of Record:
Comments: Performed By:

Adult Echo: Measurements and Calculations

2D

LV Mass (Cubed)	204 g	MV Area (Planim)	1.01 cm²	MV Area	1.01 cm²

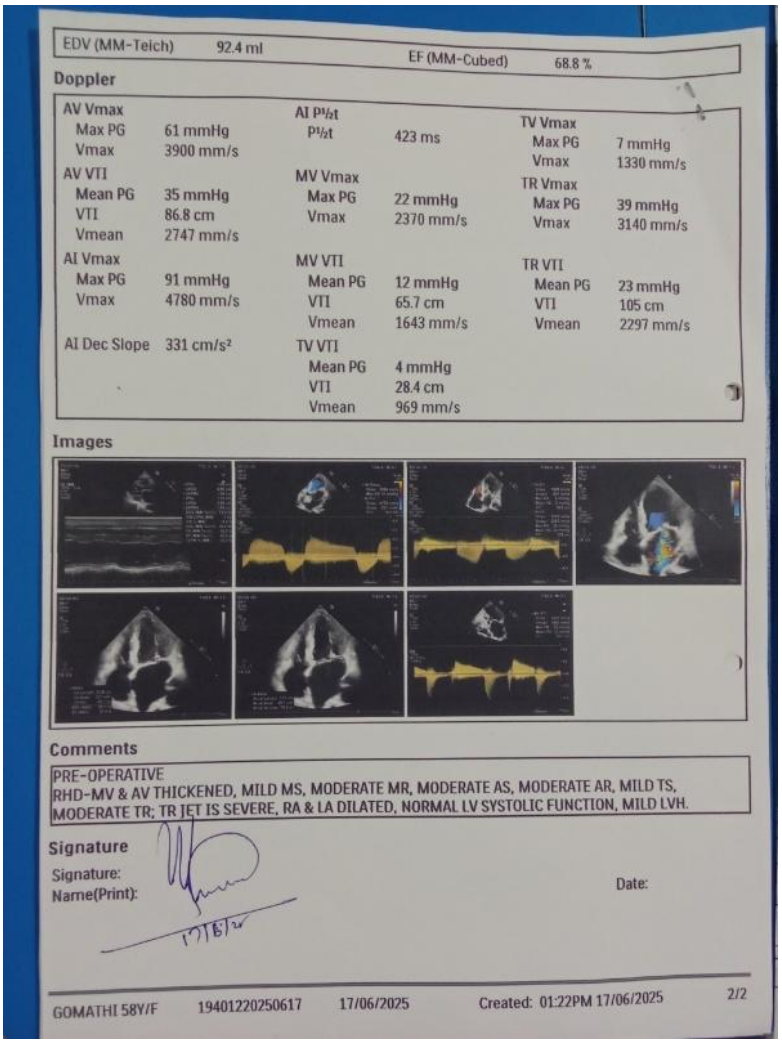
MMode

IVSd (MM)	0.870 cm	ESV (MM-Teich)	61.2 ml	FS (MM-Cubed)	36.6 %
LVIDd (MM)	5.96 cm	SV (MM-Teich)	116 ml	IVS % (MM)	0.000 %
LVPWd (MM)	0.870 cm	FS (MM-Teich)	36.6 %	LVPW % (MM)	34.5 %
IVSs (MM)	0.870 cm	EF (MM-Teich)	65.4 %	LA Dimen (MM)	4.4 cm
LVIDs (MM)	3.78 cm	EDV (MM-Cubed)	212 ml	AoR Diam (MM)	2.9 cm
LVPWs (MM)	1.17 cm	ESV (MM-Cubed)	54.0 ml	LA/Ao (MM)	1.52
IVS/LVPW (MM)	1.00	SV (MM-Cubed)	158 ml		
[redacted] (MM-Teich)	177 ml	EF (MM-Cubed)	74.5 %		

Doppler

AV Vmax		MV VTI		TR Vmax	
Max PG	66 mmHg	Mean PG	6 mmHg	Max PG	52 mmHg
Vmax	4050 mm/s	VTI	81.5 cm	Vmax	3600 mm/s
		Vmean	1037 mm/s		
AV VTI		MV Dec Slope	232 cm/s²	TR VTI	
Mean PG	35 mmHg			Mean PG	27 mmHg
VTI	92.8 cm			VTI	121 cm
Vmean	2682 mm/s			Vmean	2388 mm/s

MRS. GOMATHI 31291320250530 30/05/2025 Created: 01:44PM 30/05/2025 1/3
55Y/F


EDV (MM-Teich) 92.4 ml EF (MM-Cubed) 68.8 %

Doppler

AV Vmax		AI P½t		TV Vmax	
Max PG	61 mmHg	P½t	423 ms	Max PG	7 mmHg
Vmax	3900 mm/s			Vmax	1330 mm/s
AV VTI		MV Vmax		TR Vmax	
Mean PG	35 mmHg	Max PG	22 mmHg	Max PG	39 mmHg
VTI	86.8 cm	Vmax	2370 mm/s	Vmax	3140 mm/s
Vmean	2747 mm/s				
AI Vmax		MV VTI		TR VTI	
Max PG	91 mmHg	Mean PG	12 mmHg	Mean PG	23 mmHg
Vmax	4780 mm/s	VTI	65.7 cm	VTI	105 cm
		Vmean	1643 mm/s	Vmean	2297 mm/s
AI Dec Slope	331 cm/s²	TV VTI			
		Mean PG	4 mmHg		
		VTI	28.4 cm		
		Vmean	969 mm/s		

Images

Comments

PRE-OPERATIVE
RHD-MV & AV THICKENED, MILD MS, MODERATE MR, MODERATE AS, MODERATE AR, MILD TS, MODERATE TR; TR JET IS SEVERE, RA & LA DILATED, NORMAL LV SYSTOLIC FUNCTION, MILD LVH.

Signature

Signature:
Name(Print):
Date:

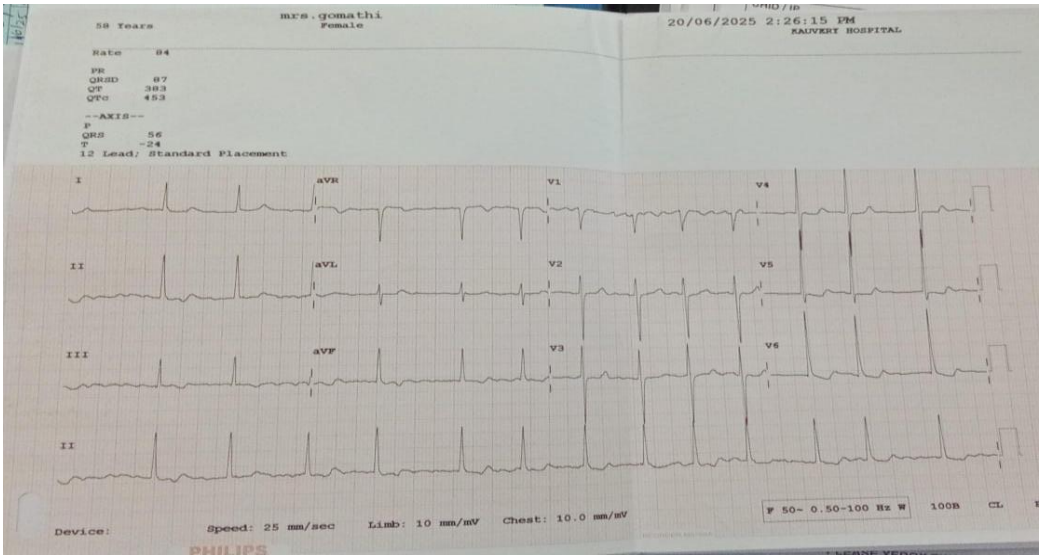
GOMATHI 58Y/F 19401220250617 17/06/2025 Created: 01:22PM 17/06/2025 2/2

1.3. Lab Investigation

HB	9.4
PCV	27.8
WBC	16130
Platelet	201000
PT [Prothrombin Time]-	16.0
Potassium	4.5
Sodium	132.4
Urea	25.19
Creatinine	– 1.18

Blood grouping typing	B* Positive
Triple h	Negative
Bleeding time	3min
Clotting time	4min

1.4. ECG



After informed consent. Pre medications given. Pre investigation enclosed. anesthetist fitness was obtained and patient underwent DVR- MVR with 17mm mitral valve/AVR with 18 mm miltonia valve replacement was done.

1.5. Operational Notes

- Median sternotomy pericardium opened.
- Heparinised opened. Heparinised CPB estabilize by aorta bicaval cannulation LV vented via RSPV. AXC heart arrested by ostial delnido CP.
- Heart cooled to 29-degeree celcius. transverse aortotomy done.
- Aortic Valve excised SVC and IVC and IVC snugged RA. Opened.
- IAS opened mitral valve excised replaced with 27mm mitonia valve with 2.0 ethi-bound interrupted pledgetted mattress sutures.
- Aortic valve replacement done using 18mm miltonia valve with 2.0 ethibound interrupted pledgetted mattress suture. Aortotomy closure done rewarmining started.IAS closed heart deaired AXC released. Heart picked up in controlled AF rhythm. RA closed.

- On full rewarming came off CPB protamine given. Heart decannulated haemostasis secured.
- Routine closure done with drain tube and pacing wire insitu.
- TEE done showed normally functioning aortic and mitral valve prosthesis.

Aortic Valve Surgery: Ross Procedure (Auto transplant of pulmonic valve to the aortic position)

- Re-implantation of the coronary arteries
- Homograft valve in the pulmonic position
- Indications

a. Younger patients
b. No anticoagulation
c. Requires similar sized aortic and pulmonic roots

Post procedure uneventful. Patient was shifted to CT ICU with ventilator.

2.. CT – ICU Care

- After surgery, patient was taken to the intensive care unit and monitored.
- Cardiac monitors – to monitor vital signs
- Patient with Mechanical ventilator support.
- Infusion pumps – e g. Inj. NTG, Inj. Dobutamine, Inj. Nor adrenaline to regulate the Heart rate and BP.
- ICD tube connected with negative pressure suction.
- Pain medication given as appropriate.
- Inotropes slowly tapered and stopped.
- ICD Tube removed after 2 days.
- Patient hemodynamically stable and patient shifted to ward.

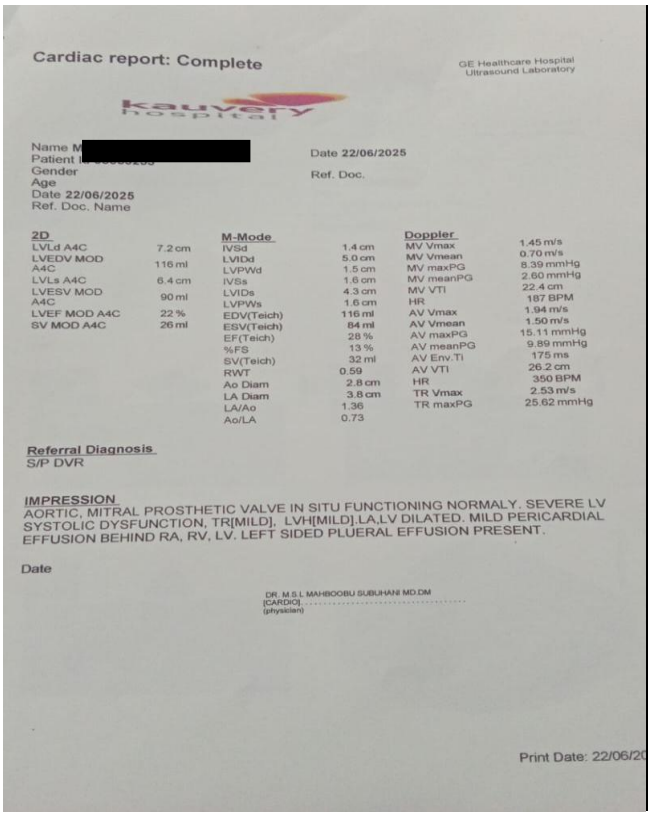
3. Treatment

Drug	Dosage	Frequency
Tab. Acitrom	2mg	OD
Inj. Pitaz	4.5g IV	TDS
Tab.Ecospirin	75mg	OD
Inj. Pan	40 mg	OD
T. dytor	5 mg	BD
T. Conco	2.5 mg	OD
T. Dolo	650 mg	TDS
Neb Duolin	1.25 mg + 500 mcg	TDS
Neb Budecort	0.5 mg	TDS

4. Nursing Management

- Counselling given to the attenders related to post op care.
- Healthy dietary habit advised, then explained avoid green leaf vegetables.
- Wound kept clean and healthy
- Chest physiotherapy given
- Encouraged spirometry exercises
- I/O chart maintained. Early ambulation is done Educated the patient to avoid weight lifting.
- After 1 week INR to be checked in lab.
- Early ambulation is done Educated the patient to avoid weight lifting.

Post OP Chest X-ray



Cardiac report: Complete

GE Healthcare Hospital Ultrasound Laboratory

kauvery hospital

Name M [redacted]
Patient I
Gender
Age
Date 22/06/2025
Ref. Doc. Name

Date 22/06/2025
Ref. Doc.

2D		M-Mode		Doppler	
LVLd A4C	7.2 cm	IVSd	1.4 cm	MV Vmax	1.45 m/s
LVEDV MOD A4C	116 ml	LVIDd	5.0 cm	MV Vmean	0.70 m/s
		LVPWd	1.5 cm	MV maxPG	8.39 mmHg
LVLs A4C	6.4 cm	IVSs	1.6 cm	MV meanPG	2.60 mmHg
LVESV MOD A4C	90 ml	LVIDs	4.3 cm	MV VTI	22.4 cm
		LVPWs	1.6 cm	HR	187 BPM
LVEF MOD A4C	22 %	EDV(Teich)	116 ml	AV Vmax	1.94 m/s
SV MOD A4C	26 ml	ESV(Teich)	84 ml	AV Vmean	1.50 m/s
		EF(Teich)	28 %	AV maxPG	15.11 mmHg
		%FS	13 %	AV meanPG	9.89 mmHg
		SV(Teich)	32 ml	AV Env.Ti	175 ms
		RWT	0.59	AV VTI	26.2 cm
		Ao Diam	2.8 cm	HR	350 BPM
		LA Diam	3.8 cm	TR Vmax	2.53 m/s
		LA/Ao	1.36	TR maxPG	25.62 mmHg
		Ao/LA	0.73		

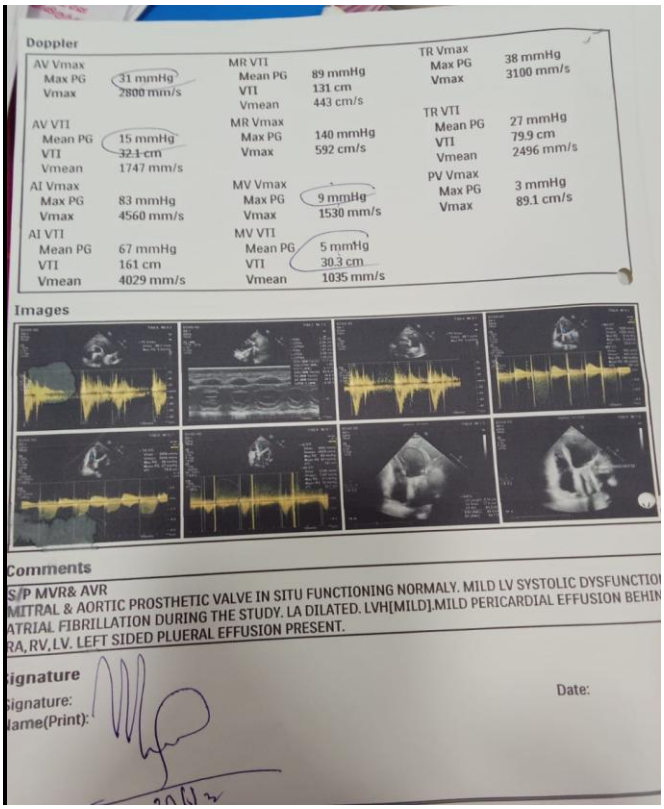
Referral Diagnosis
S/P DVR

IMPRESSION
AORTIC, MITRAL PROSTHETIC VALVE IN SITU FUNCTIONING NORMALY. SEVERE LV SYSTOLIC DYSFUNCTION, TR[MILD], LVH[MILD],LA,LV DILATED. MILD PERICARDIAL EFFUSION BEHIND RA, RV, LV. LEFT SIDED PLUERAL EFFUSION PRESENT.

Date

DR. M.S.L MAHBOOBU SUBUHANI MD.DM
[CARDIO]
(physician)

Print Date: 22/06/20



Doppler

AV Vmax		MR VTI		TR Vmax	
Max PG	31 mmHg	Mean PG	89 mmHg	Max PG	38 mmHg
Vmax	2800 mm/s	VTI	131 cm	Vmax	3100 mm/s
AV VTI		Vmean	443 cm/s	TR VTI	
Mean PG	15 mmHg	MR Vmax		Mean PG	27 mmHg
VTI	32.1 cm	Max PG	140 mmHg	VTI	79.9 cm
Vmean	1747 mm/s	Vmax	592 cm/s	Vmean	2496 mm/s
AI Vmax		MV Vmax		PV Vmax	
Max PG	83 mmHg	Max PG	9 mmHg	Max PG	3 mmHg
Vmax	4560 mm/s	Vmax	1530 mm/s	Vmax	89.1 cm/s
AI VTI		MV VTI			
Mean PG	67 mmHg	Mean PG	5 mmHg		
VTI	161 cm	VTI	30.3 cm		
Vmean	4029 mm/s	Vmean	1035 mm/s		

Images

Comments

S/P MVR& AVR
MITRAL & AORTIC PROSTHETIC VALVE IN SITU FUNCTIONING NORMALY. MILD LV SYSTOLIC DYSFUNCTIO
ATRIAL FIBRILLATION DURING THE STUDY. LA DILATED. LVH[MILD],MILD PERICARDIAL EFFUSION BEHIN
RA, RV, LV. LEFT SIDED PLUERAL EFFUSION PRESENT.

Signature
Signature:
Name(Print):

Date:

S/P MVR AND AVR: Mitral & aortic prosthetic valve in situ functioning normally, mild LV Systolic dysfunction, atrial fibrillation during the study. LA dilated. LVH (mild) pericardial effusion behind RA, RV, LV,Left side pleural effusion present.

5. Dietary advice

During the post-operative period clear liquid was given, followed by liquid diet is started. After that semi solid diet was given to patient, which was tolerated and after that advised to take potassium rich diet and avoid green leafy vegetables.

5.1 Condition at Discharge

General condition was good

Vitals stable

5.2 Discharge Advice

S No	Drug	Dose	Frequency	Duration
1	T. Abphylline		BD	1 week
2	T. Warfarin	¾ mg	OD(6pm)	alternative day
3	T. Ecosprin	75 mg	BD	1 week
4	T. Dytor plus	10mg	OD (0-1/2-0)	1 week
5	T. Ultracet			sos
6	T. Cardarone	50 mg	OD	1 week
7	T. Digoxin	0.25mg	OD	Alternative day
8	T. Vibact		OD	1 week
9	T. Becosule		OD	1 week
10	T. Ceftas	200mg	BD	1 week
11	T. Clonotril	0.25mg	OD	1 week
12	T. Prolomet xl	12.5mg	OD	1 week
13	T. Pan dsr	40mg	OD(Before Food)	1 week

5.3 Follow Up

Review after 1 week with ECG, ECHO, and urea. creatinine, sodium, potassium, PT INR, In case of any breathlessness, bleeding, pain, swelling around the surgical site.

6. Conclusion

DVR can be a life-changing procedure for individuals with severe heart valve disease, offering a chance for improved health and quality of life.

Reference

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