

DISCHARGE SUMMARY

PATIENT NAME: BABY OF SHASHI	AGE: 4 MONTHS & 17 DAYS, SEX: M
REGN: NO: 13426492	IPD NO: 23226/25/1201
DATE OF ADMISSION: 03/02/2025	DATE OF DISCHARGE: 10/02/2025
CONSULTANT: DR. K. S. IYER / DR. NEERAJ AWASTHY	

DISCHARGE DIAGNOSIS

1. S/P Patent ductus arteriosus stenting done using Medtronic integrity Coronary stent (3.5 X 18mm) on 08/10/2024 at Fortis Escorts Heart Institute, New Delhi for

- Complex cyanotic congenital heart disease
- Large perimembranous ventricular septal defect (Non-routable aorta)
- Pulmonary atresia (membranous atresia)
- Patent ductus arteriosus dependent pulmonary circulation
- Confluent branch Pulmonary arteries
- L-malposed aorta
- Patent foramen ovale (right to left shunt)

2. Now elective admission for 2nd stage palliative surgery (Bidirectional Glenn Shunt)

- Cyanotic Congenital Heart Disease with decreased pulmonary blood flow
- Single ventricle physiology
- Congenitally Corrected Transposition of great arteries
- Large inlet ventricular septal defect
- Pulmonary atresia
- Patent ductus arteriosus stent in situ, left sided

OPERATIVE PROCEDURE

Right sided Bidirectional Glenn Shunt (The cephalic end of Superior vena cava anastomosed end-side to Right pulmonary artery) + Azygous vein ligation + Patent ductus arteriosus clipping done on 04/02/2025

RESUME OF HISTORY

Baby of Shashi is a 4 months old male infant (date of birth: 18/09/2024) from Agra who is a case of complex congenital heart disease. He is 1st in birth order and is a product of full term LSCS (lower segment caesarian section) delivery, born to 3rd gravida. His birth weight was 3 kg. Mother had history of previous two fetal losses. Maternal age is currently 30 years.

On day 3rd day of life during follow up physician noticed bluish discoloration of feet and lips and was advised Echo. Echocardiography was done and baby was diagnosed to have complex congenital heart disease (duct dependent pulmonary circulation), then patient was referred to Safdarjung. He was initially stabilized at Safdarjung hospital on prostin infusion. He was then referred to Fortis Escorts Heart Institute, New Delhi for medical stabilization on 06/10/2024.

He was admitted in Fortis Escorts Heart Institute, New Delhi in emergency basis. Baseline investigations (CBC, RFT, LFT, viral markers, Blood grouping/cross matching, S creatinine) were sent and ECG and chest x-ray was done. Echo done revealed duct dependent pulmonary circulation. his baseline saturation was 70-80% and prostaglandin infusion was not continued. He underwent CT pulmonary angio on 07/10/2024 which revealed Situs solitus, D-loop ventricles. Large subaortic VSD. Dilated RA and RV. Pulmonary atresia. L-Malposed aorta. PDA dependent pulmonary circulation. He was planned for Patent ductus arteriosus stenting in view of restricted Patent ductus arteriosus as a case of duct dependent pulmonary circulation.

On admission his venous blood gas was done which showed pH 7.25, pCO₂ 57.6mmHg, pAO₂ 78 mmHg, metabolic acidosis (BE -3.6mmol/L), Lactate 0.72mmol/L and bicarbonate 24.9mmol/L.

He underwent Patent ductus arteriosus stenting done using Medtronic integrity Coronary Stent (3.5 mmX18 mm) on 08/10/2024.

He was intubated on 3rd day of admission for Patent ductus arteriosus stenting and ventilated with adequate analgesia and sedation for 28.25 hours and extubated on 4th day of admission. Following extubation he was supported with nasal CPAP in view of resting tachypnoea till 6th day of admission. He was weaned from oxygen to air by 7th day of admission.

He was supported with dobutamine (3rd - 6th day of admission → 5mic/kg/min @ 1 ml/hr).

Post procedure the patient was kept in CCU for observation. He was gradually started on oral feed and weaned off supports. He was discharged on 13/10/2024 in stable condition with advice to regular follow up.



**DIVISION OF PEDIATRIC CARDIOLOGY
CARDIAC CATHETERISATION AND ANGIOGRAPHY REPORT**

NAME	: Baby of shashi	SEX	: MALE	REGISTRATION NUMBER	: 13426492
HEIGHT (cms)	: 50	WEIGHT	: 3 kg	IPD NO	: 195604/24/1201
BSA(M Sq)	:	HB(%)	: 12.7	CATH NO	:
SEDATION	: GA			CATH DATE	: 08/10/2024
ADMITTING DIAGNOSIS	:				
	:	Situs solitus Levocardia D loop Atrioventricular concordance Confluent branch PA's			
ABNORMALITIES	:	Pulmonary atresia Large perimembranous VSD(R-L) L malposed Aorta STRECHED PFO PDA dependent pulmonary circulation			
PROCEDURE DONE	:	PDA stenting			
PREVIOUS SUREGRY	:	Nil			
VASCULAR ACCESS	:				
	:	Left Axillary artery	4F		
CATHETERS/ BALLOONS/STENTS		FRENCH	SIZE	LENGTH	
MEDTRONIC INTEGRITY coronary Stent			3.5 X 18 mm		
GUIDE WIRES:		SIZE	LENGTH	CONFIGURATION	
Whisper G wire		0.014	180	Extra Floppy	
ALL STAR		0.035	260	Floppy	

Hemodynamics :

Pressure Data:						
Site	Sys	Dia	Mean	Sat	PO2	
AAO	50	28	40	84.2	75.4	



Angiogram and comments :	<ol style="list-style-type: none"> 1. Aortogram (Left Lateral & AP/cranial 30) showed left arch with PDA from undersurface of arch filling both branch Pas. 2. Stenting of the patent ductus arteriosus done using Medtronic integrity coronary Stent (3.5 mmX18 mm) 3. Post stenting Aortogram (LAO30 Cranial 15) showed good flow across stent and Branch PA's. 4. Post Procedure TTE showed PDA stent in situ with good bolus of flow across PDA stent and branch PAs
Final Diagnosis:	<p>Cyanotic congenital heart disease Pulmonary atresia (membranous atresia) L malposed aorta Large perimembranous VSD Nonroutable to aorta PFO (right to left shunt) PDA dependent pulmonary circulation Confluent branch Pas Normal Sinus Rhythm Normal LVEF S/P PDA stenting done using Medtronic integrity Coronary Stent (3.5 mmX18 mm) on 08/10/2024</p>

He was on regular follow up.

He was seen at FEHI, New Delhi on 03/01/2025. His saturation at that time was 78% with weight of 5.7 Kg. Echo was done which revealed Patent ductus arteriosus stent in situ, good flow through stent, Congenitally Corrected Transposition of great arteries, large inlet ventricular septal defect (LV non-routable to aorta), laminar flow in arch, normal LVEF, Right pulmonary artery 7.5mm (Exp 5.5mm), Left pulmonary artery origin 3.5mm, distal 5.8mm. He was advised surgical management (**palliative surgery Bidirectional Glenn Shunt**).

Now he is admitted at FEHI, New Delhi for further evaluation and management. On admission, his saturation was 80-85%, His Hb 12.5 g/dl and Hematocrit 41.6% on admission.



PULMONARY CT ANGIOGRAPHY done on 24/01/2025 revealed

Summary:

- Situs solitus; levocardia.
- D-loop configuration of ventricles is noted; morphological right ventricle is located on right side and morphological left ventricle is noted on left side.
- Atrio-ventricular concordance & ventriculo-arterial discordance.
- Large subaortic VSD.
- **Dilated RA and RV.**
- **TGA with L-malposed aorta.**
- Patent PDA stent is seen.
- No pericardial effusion is seen.

Cardiac chambers:

- Situs solitus; levocardia.
- D-loop configuration of ventricles is noted; morphological right ventricle is located on right side and morphological left ventricle is noted on left side.
- Atrio-ventricular concordance & ventriculo-arterial discordance.
- Large subaortic VSD.
- **Dilated RA and RV.**
- No pericardial effusion is seen.

Pulmonary arteries:

- **Pulmonary atresia is seen.**
- **Confluent branch pulmonary artery is seen.**
- The distal MPA measures approx. 9.8mm.
- The right PA measurements are:
 - Mediastinal part: 7.8mm.
 - Hilar part: 6.5mm.
- The left PA measurements are:
 - Mediastinal part: 8.0mm.
 - Hilar part: 7.4mm.
- **Patent PDA stent is seen arising from the undersurface of distal arch of aorta and terminating into the MPA slightly towards right side. The internal diameter measures 2.5mm.**



Aorta:

- **TGA with L-malposed aorta. Aorta arises from the morphological right ventricle and lies anterior to the MPA.**
- The aortic root appears normal. The ascending aorta appears normal, measuring approx. 15.5 x 16.0mm.
- Both coronary arteries arise from separate coronary sinuses.
- The aortic arch is left sided with normal origin of arch branches.
- DTA at level of diaphragm measures approx. 6.5mm.
- No MAPCAs are seen.

Venous drainage:

- 3 Normal systemic and pulmonary venous drainage is seen.
- Single right sided SVC is seen.

Additional findings:

- Trachea and major bronchi appear normal.
- No pleuro-pericardial effusion is seen.
- Visualized liver and spleen appear normal.
- No evidence of coarctation of aorta is seen.

In view of his diagnosis, symptomatic status, CT angio and echo findings he was advised early high risk surgery after detailed counselling of family members regarding possibility of prolonged stay as well as uncertain long term issues.

Weight on admission 6.17 kg, Height on admission 60 cm, Weight on discharge 6.17 kg

His Weight on admission 6.17 kg. (3rd – 15th Percentile); Z score 0 to – 2 SD

His blood Group B positive

Baby and his Mother SARS-COV-2 RNA was done which was negative.



All blood and urine culture were sterile.

INVESTIGATION:

ECHO

Done on 06/10/2024 which revealed Situs solitus, levocardia. D-loop ventricle. Normal systemic and pulmonary venous drainage stretched PFO. Laminar inflow. Large per membranous VSD with outlet extension (bidirectional shunting). L- malposed aorta. PA posterior with aortic anterior. Pulmonary atresia with central pulmonary atresia. PDA dependent pulmonary circulation. PDA measuring =4mm. arch not well profiled. No collection. RPA= 4mm. LPA= 4mm (exp= 5mm)

Done on 22/10/2024 revealed normal segmental analysis, patent foramen ovale, laminar inflow, large inlet ventricular septal defect (Bidirectional shunting), Patent ductus arteriosus stent in situ, good bolus of flow across Patent ductus arteriosus stent, good flow in branch Pulmonary arteries, L-malposed aorta (aorta in anterior and left to PA), laminar flow across aorta and arch, normal LVEF, no Coarctation of aorta

Done on 04/12/2024 revealed situs solitus, levocardia, L-loop, AV discordance, single outlet pulmonary atresia, Patent ductus arteriosus stent in situ, good flow across stent, patent foramen ovale (left to right), Congenitally Corrected Transposition of great arteries, large inlet ventricular septal defect (Bidirectional shunting), LV non routable to aorta, L-malposed aorta, (aorta is anterior and left to PA), laminar flow across arch and aorta, normal LVEF, no collection, MV annulus 1.3 (Z score -0.02), TV annulus 1 (Z score -1.85), Right pulmonary artery 6mm, Left pulmonary artery origin 2mm, distal 4.8mm (Exp 5.5mm)

Done on 03/01/2025 revealed Patent ductus arteriosus stent in situ, good flow through stent, Congenitally Corrected Transposition of great arteries, large inlet ventricular septal defect (LV non-routable to aorta), laminar flow in arch, normal LVEF, Right pulmonary artery 7.5mm (Exp 5.5mm), Left pulmonary artery origin 3.5mm, distal 5.8mm



POST OP ECHO

Done on 04/02/2025 revealed patent and well-functioning right Bidirectional Glenn Shunt, good flow in branch Pulmonary arteries, normal LVEF, no collection

Done on 05/02/2025 revealed patent and well-functioning right Bidirectional Glenn Shunt, good flow in branch Pulmonary arteries, normal LVEF, no collection

Done on 08/02/2025 revealed patent and well-functioning right Bidirectional Glenn Shunt, good flow in branch Pulmonary arteries, laminar inflow, Congenitally Corrected Transposition of great arteries, large inlet ventricular septal defect with pulmonary atresia, laminar aortic outflow, normal LVEF, no collection

ABDOMINAL USG

Done on 03/02/2025 revealed Liver is normal in size, measures ~ 5.7cm & shows homogeneous & normal echopattern. Intrahepatic biliary radicles, hepatic veins & portal vein are normal. Gall bladder is contracted. CBD is normal in course & caliber. Pancreas is normal in shape, size & echopattern. Spleen is normal in size & echogenicity (Span - 5.1cm). Both kidneys are normal in location, size, shape & echotexture. Cortical thickness & corticomedullary differentiation are well maintained. No dilatation of pelvicalyceal system is seen. Right kidney measures 4.2cm x 2.1cm in size Left kidney measures 4.7cm x 2.5cm in size Urinary bladder is empty.

USG BRAIN

Done on 03/02/2025 revealed No obvious focal lesion seen in brain parenchyma. Ventricles are normal. No midline shift seen.



COURSE DURING STAY IN HOSPITAL (INCLUDING OPERATIVE PROCEDURE AND DATES)

Right sided Bidirectional Glenn Shunt (The cephalic end of Superior vena cava anastomosed end-side to Right pulmonary artery) + Azygous vein ligation + Patent ductus arteriosus clipping done on 04/02/2025

REMARKS: Diagnosis: - Cyanotic Congenital Heart Disease with decreased pulmonary blood flow, Single ventricle physiology- Congenitally Corrected Transposition of great arteries with large inlet ventricular septal defect with pulmonary atresia, S/P Patent ductus arteriosus stenting- 10.10.2024. Operation : - Right sided Bidirectional-Glenn Shunt, azygous vein ligation, Patent ductus arteriosus ligation. Operative Findings: - Pericardium normal, Innominate normal, Superior vena cava good size, no left superior vena cava, right atrium / left atrium normal, Aorta anterior to Main pulmonary artery, Main pulmonary artery small sized, posterior to aorta, Branch Pulmonary arteries adequate, Coronaries normal, Patent ductus arteriosus – Patent ductus arteriosus stent in situ, left sided. Procedure: - Routine induction of General Anaesthesia and placement of monitoring lines. Standard median sternotomy. Thymus dissected and right and left lobe excised. Pericardium opened till right atrium. Systemic heparinization (300 U/kg) given. Aorta, Right pulmonary artery, Left pulmonary artery and Patent ductus arteriosus dissected. Right atrium, cannulated and Cardiopulmonary bypass initiated. Azygos Vein ligated. Patent ductus arteriosus dissected and clipped and ligated with silk. High Superior vena cava cannulation done, looped and snugged. Superior vena cava clamped and divided at the Superior vena cava – right atrium junction. The right atrium end oversewn with 5-0 prolene in two layers. Right pulmonary artery opened transversely, The cephalic end of Superior vena cava anastomosed end-side to Right pulmonary artery using 6-0 prolene. Patient weaned off Cardiopulmonary bypass with supports of Dobutamine 5 µ/kg/min. Protamine given followed by decannulation. Epicardial pacing wires (2 atrial and 1 ventricular) placed. Hemostasis secured. Upper part of pericardium kept open. Right pleura left open. Routine sternal closure over drains



His post-operative course was smooth.

He was ventilated with adequate analgesia and sedation for 17.5 hours and extubated on early 1st POD to oxygen by hood. Post extubation chest x-ray revealed bilateral mild patchy atelectasis. This was managed with chest physiotherapy, nebulization and suctioning.

He was shifted to ward on 3rd POD. He was weaned from oxygen to air by 2nd POD.

He was electively supported with dobutamine (0 – 1st POD → 2.5mic/kg/min @ 1.8 ml/hr) in view of palliative surgery – Right Bidirectional Glenn Shunt, metabolic acidosis (BE -3.4mmol/L) and lactic acidosis (Lactate 3.81mmol/L).

He was also started with milrinone (0 – 4th POD → 0.8mic/kg/min @ 1.5 ml/hr) due to metabolic acidosis (BE -3.4mmol/L) and lactic acidosis (Lactate 3.81mmol/L).

Decongestive therapy was given in the form of lasix (boluses) and aldactone.

There were no post-operative arrhythmias.

Pacing wire was removed on 4th POD.

He had no fever but had mild thrombocytopenia. His TLC was 4,360/cmm and platelets 1.17 lacs/cmm on 0 POD. He was thoroughly investigated for the same. All cultures till date are negative. Antibiotics were not required. He was clinically well and afebrile all through. His pre-discharge TLC was 11,180/cmm and platelets were 1.22 lacs/cmm.

His pre-operative renal function showed (S. creatinine 0.37 mg/dl, Blood urea nitrogen 6 mg/dl)

His post-operative renal function showed (S. creatinine 0.24 mg/dl, Blood urea nitrogen 7 mg/dl) on 0 POD

His pre-discharge renal function showed (S. creatinine 0.29 mg/dl, Blood urea nitrogen 8 mg/dl)

His pre-operative liver functions showed (SGOT/SGPT = 99/59 IU/L, S. bilirubin total 0.79 mg/dl, direct 0.24 mg/dl, Total protein 6.4 g/dl, S. Albumin 4.5 g/dl, S. Globulin 1.9 g/dl Alkaline phosphatase 442 U/L, S. Gamma Glutamyl Transferase (GGT) 41 U/L and LDH 579 U/L).



He had mildly deranged liver functions on 1st POD (SGOT/SGPT = 80/31 IU/L, S. bilirubin total 2.28 mg/dl & direct 0.72 mg/dl and S. Albumin 4.6 g/dl). This was managed with avoidance of hepatotoxic drug and continued preload optimization, inotropy and after load reduction. His liver function test gradually improved. His other organ parameters were normal all through.

His predischarge liver function test are SGOT/SGPT = 52/26 IU/L, S. bilirubin total 1.06 mg/dl, direct 0.31 mg/dl, Total protein 5.7 g/dl, S. Albumin 4 g/dl, S. Globulin 1.7 g/dl Alkaline phosphatase 183 U/L, S. Gamma Glutamyl Transferase (GGT) 23 U/L and LDH 523 U/L).

Intravenous heparin was given in the immediate post-operative period for anticoagulation. Tab. Colasprin was started on 1st POD for continued oral anticoagulation.

Thyroid function test done on 04/02/2025 which revealed normal → Thyroid function test showed T3 3.74 pg/ml (normal range – 2.15 – 5.83 pg/ml), T4 1.41 ng/dl (normal range 0.92 - 1.99 ng/dl), TSH 1.800 µIU/ml (normal range – 0.730 – 8.350 µIU/ml).

Gavage feeds were started on 1st POD. Oral feeds were commenced on 4th POD.

CONDITION AT DISCHARGE

His general condition at the time of discharge was satisfactory. Incision line healed by primary union. No sternal instability. HR 120/min, normal sinus rhythm. Chest x-ray revealed bilateral clear lung fields. Saturation in air is 84%. **His predischarge x-ray done on 08/02/2025**

Family is cautioned against vomiting, refusal to feed, diarrhoea and dehydration due to any causes which may lead to potentially fatal Glenn failure.

In view of congenital heart disease in this patient his mother is advised to undergo fetal echo at 18 weeks of gestation in future planned pregnancies.

In view of advanced maternal age, the mother had been advised to do chorionic villus sampling or amniocentesis early in any future pregnancy to exclude Down's syndrome and she has also been advised a detailed congenital anomaly scan in next pregnancy.

Other future siblings are advised detailed cardiology review.



PLAN FOR CONTINUED CARE:

DIET : Semisolids diet as advised

Normal vaccination (After 6 weeks from date of surgery)

ACTIVITY: Symptoms limited.

Nurse sitting up for 6 months.

FOLLOW UP:

Long term cardiology follow- up in view of:-

1. Palliative surgery – Right Bidirectional Glenn Shunt
2. Aspirin therapy

Review on 11/02/2025 in 5th floor at 09:30 AM for wound review

Repeat Echo after 6 - 9 months after telephonic appointment

PROPHYLAXIS :

Infective endocarditis prophylaxis prior to any invasive procedure



MEDICATION:

1. Syp. Paracetamol 90 mg PO 6 hourly x one week
 2. Tab. Pantoprazole 10 mg PO twice daily x one week
 3. Syp. Lasix 5 mg PO twice daily till next review
 4. Tab. Aldactone 3.125 mg PO twice daily till next review
 5. Tab. Colsprin 40 mg PO once with feed till next review - not to be stopped
 6. (Dose of Colsprin to be increased (5mg/kg/day) according to weight gain upto maximum of 100mg once daily)
 7. Syp. Shelcal 2.5 ml PO twice daily x 3 months
 8. Nasoclear nasal drop 2 drop both nostril 4th hrly
 9. Nebulization with normal saline 4th hrly
- All medications will be continued till next review except the medicines against which particular advice has been given.

Review at FEHI, New Delhi after 6 – 9 months after telephonic appointment
In between Ongoing review with Pediatrician

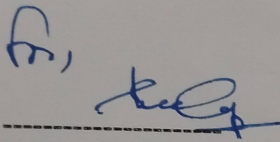
Sutures to be removed on 18/02/2025; Till then wash below waist with free flowing water

4th hrly temperature charting - Bring own your thermometer

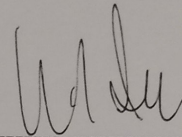
- Frequent hand washing every 2 hours
- Daily bath after suture removal with soap and water from 19/02/2025

Telephonic review with Dr. Parvathi Iyer (Mob. No. 9810640050) / Dr. K. S. IYER (Mob No. 9810025815) if any problems like fever, poor feeding, fast breathing





(DR. KEERTHI AKKALA)
(ASSOCIATE CONSULTANT
PEDIATRIC CARDIAC SURGERY)



(DR. K.S. IYER)
(EXECUTIVE DIRECTOR
PEDIATRIC CARDIAC SURGERY)

Please confirm your appointment from (Direct 011-47134540, 47134541, 47134500/47134536)

- Poonam Chawla Mob. No. 9891188872
- Treesa Abraham Mob. No. 9818158272
- Gulshan Sharma Mob. No. 9910844814
- To take appointment between 09:30 AM - 01:30 PM in the afternoon on working days

OPD DAYS: MONDAY – FRIDAY 09:00 A.M

In case of fever, wound discharge, breathing difficulty, chest pain, bleeding from any site call 47134500/47134536/47134534/47134533

Patient is advised to come for review with the discharge summary. Patient is also advised to visit the referring doctor with the discharge summary.



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