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A case study on Dilated Cardiomyopathy (DCM)

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***Abstract**: Dilated Cardiomyopathy (DCM) is a disease of the heart musculature characterized by enlargement and dilation of one or both of the ventricles along with diminished contractility with ventricular ejection fraction (LVEF) less than 40%. Symptoms may vary from none to fatigue, swelling in the legs, shortness of breath, chest discomfort, chest pain and loss of consciousness. (1)Complications can include congestive heart failure, impaired heart valve function, arrhythmia, cardiogenic shock and cardiac arrest. In rare conditions, these case may require heart transplantation if there is refractory cardiogenic shock, recurring ventricular arrhythmias, requirement of high dose of inotropes along with/without an intra-aortic balloon pump or a ventricular assist device. In this case study we describe a case of 33 year old gentleman with dilated cardiomyopathy and severe biventricular dysfunction in congestive heart failure emphasizing on nursing role in coordinating pre-transplant assessment of patient, educating patient and family, monitoring post-transplant recovery, managing immunosuppressive therapy, ensuring patient adherence to treatment regimens, and collaborating with multidisciplinary teams to optimize transplant outcomes while addressing both medical and emotional needs of the patient.(2,8)*
***Key Words:** Dilated cardiomyopathy, heart transplantation, nursing management*

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I. Introduction

The incidences of dilated cardiomyopathy in India were 106,460 cases in 1990.(Shroff S, Mittal K, Navin S). Heart transplantation in India) By 2005, 150,507 new cases were reported. There was consistent increase in incidence of as nearly 207,168 new cases were reported in 2019. Dilated cardiomyopathy (DCM) is one of its most common types, with a prevalence of 1 in 250 to 400 individuals in the general population. India's heart transplantation programme is the number one programme in South Asia with an average heart transplantation rate of 0.2 per million populations versus the global average of 1.06 pmp (2016-2018). The deceased donation rate was 0.67 pmp in India in 2018.In the context of organ transplant management, nursing professionals play a pivotal role in ensuring the success of both the transplant process and the long-term health of the patient.(4) Nurses are responsible for conducting thorough pre-transplant assessments, providing education to patients and families about the transplant procedure, expected recovery, and post-transplant care, as well as addressing any concerns. Post-transplant, they monitor for complications, including organ rejection and infections, and manage immunosuppressive therapies to prevent rejection. Nurses are also key in supporting patient adherence to complex medication regimens, tracking vital signs, and fostering patient education on lifestyle modifications and follow-up care. Their ability to collaborate with surgeons, transplant coordinators, and other healthcare professionals is crucial in ensuring optimal outcomes, while also offering emotional and psychological support to patients and their families throughout the transplant journey.(5,9)

Chief complaints, history of presenting illness, past history, family history, previous medical assessment involving any hospitalisations, investigations, diagnosis, medical management, indications for transplantation, complications during transplant, post operative status emphasizing on clinical status and role of nurses in improvement of clinical status at every stage leading to successful discharge from ICU, transit to ward, ward care, discharge from hospital and follow up(3,10,8).

Results: The patient, initially presenting with low urine output, abdominal distension, and shortness of breath underwent successful Heart Transplant . Postoperative recovery was uneventful, and the patient demonstrated significant improvement during hospitalization.
Conclusion: Dilated cardiomyopathy (DCM) is the most common type, occurring mostly in adults younger than 50. It affects the heart's ventricles and atria, the lower and upper chambers of the heart. Timely diagnosis and surgical intervention contributed to a favourable outcome, highlighting the successful management of dilated cardiomyopathy.
Keywords: Dialated cardiomyopathy; severe biventricular dysfunction; Surgical Intervention; Case study; ADL (Activity of Daily Living); OPD (Outpatient Department); PFE (Patient & Family Education)

CASE DESCRIPTION

INTRODUCTION: - Dilated cardiomyopathy is a type of heart muscle disease that causes the heart chambers (ventricles) to thin and stretch, growing larger. Dilated cardiomyopathy makes it harder for the heart to pump blood to the rest of the body. Symptoms of dilated cardiomyopathy — such as fatigue and shortness of breath — can mimic other health conditions Patient was admitted with above mentioned complaints. Postoperatively patient was shifted to CTICU on mechanical ventilation and ionotropic support in hemodynamically stable condition .He was extubated on first Postoperative day. ICD were removed on POD 3,patient was shifted to room on POD 7.

Surgical management

Operative Procedure: Orthotopic Heart Transplantation under General Anesthesia
Operative Findings:Massive cardiomegaly was noted, with significant dilation of the right atrium (RA), right ventricle (RV), left atrium (LA), and left ventricle (LV). The aorta appeared healthy.
Procedure:A median sternotomy was performed to access the thoracic cavity. The pericardium was opened in the midline, and stays were placed for stabilization. Dissection of the superior vena cava (SVC) and inferior vena cava (IVC) was completed. The ascending aorta was carefully separated from the main pulmonary artery and right pulmonary artery. Marker stitches were placed for orientation. Heparin was administered, and aortic bicaval cannulation was performed. A cardioplegia (CP) cannula was positioned in the ascending aorta following successful bicaval cannulation, and cardiopulmonary bypass (CPB) was established. The distal ascending aorta was cross-clamped.
The donor heart was prepared with sequential dissection, leaving a cuff of the posterior left atrial wall, pulmonary vein, aorta, and main pulmonary artery. The donor heart was carefully inspected. The left atrial appendage stump was closed, and the donor heart was positioned within the pericardial cavity.
Anastomosis:A sequential anastomosis of the donor heart to the recipient's left atrial cuff and great vessels was performed in the following order.
Nursing management: Highly skilled and specialized nursing care is essential for all the nurses who work in heart transplant unit. The nurses in the Team plays an integral role during the entire transplant process, during the pre transplant phase, nursing expertise is exemplified in the teaching of transplant procedures to patient and family and supportive care which starts on the day the patient and the family decides to go for transplant on admission to the unit, and that continues throughout their journey

Infection Prevention:

Any personnel who enter the transplant unit adhered to the infection control practices. However, the nurses in the department holds the baton to ensure everyone in the department followed the practices to 100% compliance Strict aseptic technique, personal and environmental hygiene was maintained ,Regular mouth wash for oral care was given. All care bundles of central line insertion and maintenance was followed, food was provided to maintain adequate nutrition, Proper Isolation practices and maintaining the required positive pressure and proper maintenance of HEPA filter was done

Care of Central Line:

A right internal jugular vein catheter was inserted prior to the transplant. Complete aseptic technique maintained throughout the stay.

Drugs:

POST OPERATIVE DRUGS				
SL NO	CATEGORY	NAME OF DRUG	DOSE	FREQUENCY
1	Immunosuppressant	Tab.Prednisolen	15MG	BD
		Tab.Tacrolimus.	2MG	OD
		Tab Mycophenolate mofetil	750MG	OD
2	Multivitamin	Tab .Zincovit	1 TAB	OD
3	Antiviral	Tab Valancyclovyr	450MG	OD
4	Antifungal	Tab.variconazole	200MG	BD
5	Antibiotic	Tab.levoflox	500MG	OD
6	Dyspepsia	Tab.pan D	40MG	OD
7	Diuretics	Tab Diator	10MG	BD
8	Antiplatelets	Tab.Ecospirin –AV	75/10MG	OD
9	Pain/fever	Tab.Dolo	650	SOS

Nutritional Support:

Nutrition is an important part of a healthy life before, during, and after your transplant. The course of transplant is long, and the side effects like nausea and vomiting are unavoidable during this time. The food intake became lesser due to hospitalization. Strict fluid restriction to 1.5 litre to 2 litre, less salt and avoided fresh fruits, juices and coconut water for 2 weeks.

A.Attain and sustain optimal body weight

B. Limit the consumption of added sugars and concentrated sweets.

C. Moderately reduce dietary cholesterol intake.

D. Minimize the overall consumption of saturated fats (typically solid at room temperature and primarily of animal origin).

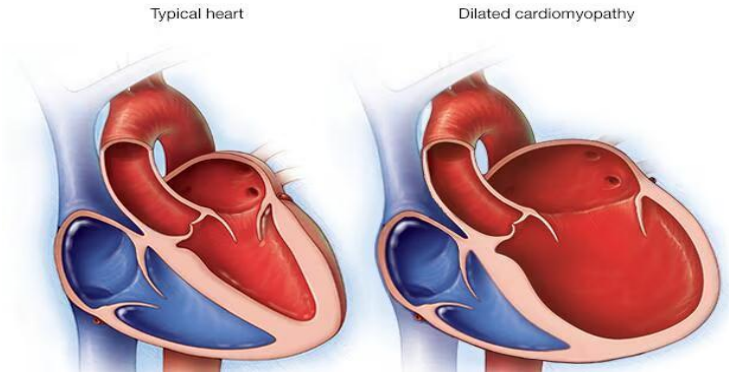
E. Replace saturated fats with polyunsaturated fats (typically liquid at room temperature and derived from plant sources).

F. Restrict sodium intake to recommended levels.

Management of pain:

Pain was assed every hourly and managed conservatively. A systematic escalation of analgesics was done to alleviate the symptoms.

II. DISCUSSION



https://www.mayoclinic.org/diseases-conditions/dilated-cardiomyopathy/symptoms-causes/syc-20353149

CAUSES EVALUATION

BOOK PICTURE	PATIENT PICTURE
Shortness of breath (dyspnoea) during activity or while lying down	Shortness of breath (dyspnoea) during activity or while lying down
Reduced ability to exercise	Reduced ability to exercise
Swelling (oedema) in the legs, ankles, feet or belly (abdomen)	No
Chest pain or discomfort	Chest pain or discomfort

Fast, fluttering or pounding heartbeat (palpitations)	Fast, fluttering or pounding heartbeat (palpitations)

(1,2)

CATEGORY	**CAUSE**
Vascular	Ischemic
Infective	Viral(eg:entero virus,coxsackie,HIV, Bacterial(eg:lyme disease,group A beta hemolytic strep)
Inflammatory	Sarcoidosis
Autoimmune	Systemic lupus erethematosus
Metabolic	Heamachromatosis
Endocrine	Hyperthyroid
Drug related	Alcohol ,Cocaine, Chemotherapeutic agents,(eg:Doxorubicin) heavy metals (eg: cobalt)
Congenital/Genetic	Autosomal dominant mutations in cytoskeleton proteins(eg:alpha cardiac actin) Autosomal recessive (eg:alstrom syndrome) X-Linked(eg:Duchenne muscular dystrophy) Mitochondrial
idiopathic	Peri/Post partum

(3,4)

BOOK PICTURE	PATIENT OICTURE
Heart attack (myocardial infarction or MI)	YES
Complications of late-stage pregnancy	NA
Diabetes	NO
Excessive iron in the heart and other organs (hemochromatosis)	NO
Viral infection of the heart muscle- Myocarditis	YES
High blood pressure	YES
Obesity	YES
Heart valve disease (Eg: Rheumatic Heart Disease)	NO
Heart defects present at birth (congenital heart disease)	NO
Exposure to toxins, such as lead, mercury and cobalt	NO
Use of certain cancer medications	NO
Irregular heartbeats (arrhythmia)	YES
High blood pressure in the lungs (pulmonary hypertension)	YES
Irregular heartbeats (arrhythmia)	YES
Alcoholism or drug abuse	NO
Heart Disease secondary to Chronic lung diseases, such as emphysema or chronic obstructive pulmonary disease (COPD)	NO

(2,3,4,5)

Patient and Family Education:
Patient and family education is a team effort and that starts on the day the patient or the family approaches the transplant physician or any of the transplant team, and it continues throughout the transplant journey. The transplant nurse shoulders the responsibility of teaching the patient in every transplant unit as they are available all the time with the patient. The nurse plays a major role in enhancing the family's level of understanding about the process of Heart transplant and its possible side effects. The isolation practices and policies and its significance Hand hygiene and personal hygiene practices and its importance. Educating the family and preparing them for the discharge towards the recovery starts on the day of admission itself.

- **Follow-up care**: Provide ongoing support and education to promote long-term management and prevention of further complication

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