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A Case Report on Permanent Dual Chamber Pacemaker

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Background: The dual-chamber, rate-modulated mode (referred to as DDDR) is the most recent cardiac pacing mode to become available. It restores both rate responsiveness and atrioventricular synchronization in patients with sinus node dysfunction and atrioventricular block. This pacing method combines rate-modulated dual-chamber and single-chamber technology. As a result, it is required to program both a maximum and a minimum tracking rate and a maximum sensor rate, as in dual-chamber and single-chamber rate-modulated devices, respectively.

Case Presentation: A 55-year-old female was admitted to A.V. B.R. Hospital with a complaint of breathlessness on exertion chest pain last 10 days. The patient has had hypothyroidism seen 2 years. No history of Hypertension and Diabetes Mellitus, Patient was conscious and oriented, All the investigation was done. FORTIFY SSURA VVED DDDR pacing (MRI compatible) was connected to lead, P-wave 3:2- 4.0, R- wave 9.2- 11.5mV. Device positioned in right infra-clavicular pocket.

Conclusions: A 55-year-old female patient was admitted to the hospital with the chief complaint of breathlessness on exertion chest pin last 10 days. After all investigation patient was diagnosed with

a case of permanent DDDR pacemaker. Now she is going to under a pacemaker procedure and treatment. Now patient prognosis is better than the previous and I advise the patient for the regular 15 days follow-up.

Keywords: Cardiac pacing; DDDR pacemaker; atrioventricular block.

1. INTRODUCTION

When the heart's regular conduction pathway is compromised, an artificial cardiac pacemaker is employed to keep it going. The myocardium, one or more pacing leads, and a power source (battery-powered pulse generator) with programmable electronics make up the basic pacing circuit. a signal electrical the stimulation passes from the pulse generator to the myocardium's wall via the leads. The heart muscle is "trapped" and forced to contract. The FDA recently approved a leadless pacemaker that is entirely implanted in the right ventricle [1].

Pacemakers today are small, complex, and physiologically exact. The atrium and/or one or both ventricles are paced. Demand pacemakers make up the majority of pacemakers. This means they detect the electrical activity of the heart and only fire when the HR falls below a certain threshold. There are two main characteristics of demand pacemakers [2].

- When the heart rate is adequate, a sensing device disables the pacemaker.
- When no QRS complexes occur within a certain amount of time, the pacemaker is triggered.

2. CASE PRESENTATION

A 55-year-old female was admitted to A.V.B.R. Hospital with a complaint of breathlessness on exertion chest pin last 10 days. The patient has been gone all the investigation patient was diagnosed as a case of permanent DDDR pacemaker. The patient has a history of Hypothyroidism. The patient does not have any past medical history about communicable diseases and non-communicable diseases like hypertension, diabetes mellitus, tuberculosis, hepatitis, acquired immunodeficiency syndrome The patient does not have any significant surgical history in the past; presently the patient did the symptomatic treatment. The patient belongs to a nuclear family with only four family members in the family no one having any communicable or non-communicable diseases except the patient. The patient and her family member do not have any abnormal genetic disorder or not genetic predisposing genetic history. The patient is a housewife, and he is leaving in a rural area of the Amravati district.

2.1 Clinical Finding

Patient undergone through blood investigation as follow:

Investigation	Patient Value
Blood Investigation	
Hemoglobin	14.5 gm/dL
Total RBC Count	5.6 cells/mcL
Total WBC Count	13100 per microliter of blood
Haematocrit	39.2%
Mean Corpuscular Hemoglobin Concentration (MCHC)	31.8g/dl
Mean Corpuscular Volume	79.1fl
Mean Corpuscular Hemoglobin	25.1 picograms
Total Platelet Count	2.14 per microliter of blood
Monocytes	03
Granulocytes	65
Lymphocytes	30
Red Cell Distribution Width (RDW)	18.5
Eosinophils	02
Basophils	00
Urine Examination	
Urine Albumin	Absent
Urine Sugar	Absent
Epithelial Cell	Absent
Pus Cell	Present 2-4 Cells/HPF

2.2 Physical Examination was done before Surgery

The Patient's general appearance is good, he was well-nourished, the patient was active and not dull nature, the patient mentioned hygiene and personal grooming, Patient's mental status is normal, but slight behavior changes occur due to the hospitalization disease condition and diagnostic procedure. Patient height is 137cm, weight 52 kg, a Patient vital sign is normal. That is temperature 100°F, pulse: 78 beats/minute, respiration: 18 breath/minute, blood pressure 120/80mmhg, other physical examination is in respiratory system bilateral is clear, cardiovascular system S1 S2 node is positive, in abdominal examination abdomen is soft, nontender. In another no deformity.

2.3 Diagnostic Assessment

Electrocardiogram (ECG): Electrocardiogram measures abnormal heart's electrical impulses due to graphical leads was abnormal.

Echocardiogram: Echocardiogram abnormal images of beating heart on a monitor.

2.4 Pacemaker Procedure

AED R2 Pads were attached to the Sternum and the mid scapular region
Local Anesthesia was given in the infra-Clavicular region
The Left subclavian vein puncture was taken.
TENDRILSTS Pacing Lead 2088TC-52cm
Tined Endo-cardinal pacing Lead positioned at the RV Apex & RA Appendage.
Lower Rate 60 PPM/U/TR 130 PPM
RV Lead Threshold 0.5 V/Impedence-650 0.
RA Lead Threshold 0.5 V/Impedence-98570). No diaphragmatic pacing @ 10 V
LEFT Infra-Clavicular pocket was made.
FORTIFY ASSURA VVED DDDR Pacing Device (MRI Compatible) was connected to lead
Rate kept at BOS 100 BPM & EOS 85 BPM
Sensitivity 2.0m V
P-wave 3:2-4.0
R-wave 9.2-11.5 mV. Device positioned in the RIGHT infra-Clavicular pocket.
The wound was closed 2.0 Vicry) & 3.0 Mono-Vicryl.

2.5 Medical Management

Nursing Assessment

- Admission Assessment: Determine and record your baseline vital indicators,

including your heart rate, blood pressure, respiration rate, oxygen saturation, temperature, and discomfort.

- Physical assessment: examine per head to feet examination and keep track of finding.
- Fluid management: As directed, intravenous fluid. If a patient has a low level of awareness, is vomiting, or has frequent convulsions, enteral feeds should be discontinued.
- Administer antibiotics. Once the choice to treat has been made, antibiotics should not be delayed for more than 30 minutes.
- Blood tests: Blood cultures, Full blood count, glucose, urea, and electrolytes are all tests that should be performed.
- Low stimulus environment: minimize crowd and give the patient a quiet environment A calm, darkly light environment might help to minimize tension [3].

Discharge Planning

- Advice to make a therapeutic diet plan and follow them, avoid fatty foods,
- Maintain personal hygiene and prevent further infection.
- Advice to reduce heavy exercise, and heavy work.
- Administration of medicine on time and regular follow-up.
- Counseling the patient related to the disease.

2.6 Dietary Management

In health and disease, the basic nutrient needs of adults differ. These requirements will be discussed briefly from the carbon, carbohydrate, fat, protein, fluid, electrolyte, vitamin, and trace elements viewpoint, based on the American Society for Parenteral and Enteral Nutrition guidelines Board of Directors and the Clinical Guidelines Taskforce. The requirements for nutrients are macronutrients (energy, protein, lipids) and micronutrients (vitamins, minerals) [4].

- Increase your intake of whole-grain foods.
- Include a wide range of fruits and vegetables.
- Reduce the amount of sugar and salt in your diet (sodium).
- High-fat foods, such as red meat, cheese, and baked products, should be avoided.
- Reduce the number of harmful fats, such as saturated and trans fats, in your diet. Butter and shortening, for example, are

Sr. No.	Name of Drug	Dose	Route	Frequency	Drug Action
1.	Injection Targocid	400 mg	IV	OD	Antibiotic
2.	Injection Ceftriaxone	1 gm	IV	BD	Antibiotic
3.	Tab Amiodarone	200mg	Oral	TDS	To restore normal heart rhythm and maintain a regular, steady heartbeat
4.	Tab Welhart	50 mg	Oral	BD	To stabilize heart rhythms (particularly atrial fibrillation)
5.	Tab Prolomet XL	50 mg	Oral	OD	To treat high blood pressure
6.	Tab Dytor Plus	20 mg	Oral	OD	To reduce excess fluid levels in the body while maintaining the potassium balance
7.	Tab Ramistar	2.5 mg	Oral	OD	Reduces stress on the heart and relaxes the blood vessels
8.	Tab Thyrox	25 mg	Oral	OD	To treat an underactive thyroid
9.	Tab Alprax	0.25 mg	Oral	OD	To treat anxiety

more likely to be solid at room temperature.

- Substitute monounsaturated and polyunsaturated fats for saturated fats. At room temperature, they are more likely to be liquid.

3. DISCUSSION

The goal of a pacemaker is to keep the heart rate stable, either because the natural pacemaker isn't fast enough or because the heart's electrical conduction pathway is blocked. Modern pacemakers are programmable from the outside, allowing a cardiologist, specifically a cardiac electrophysiologist, to choose the best pacing modes for individual patients. Modern gadgets are demand pacemakers, in which the heart is stimulated according to the circulatory system's dynamic demand [5,6].

The majority of modern pacemakers have many functions. The most basic version keeps track of the heart's natural electrical beat. When the pacemaker wire or "lead" fails to detect heart electrical activity in the chamber - atrium or ventricle - within a typical beat-to-beat time frame - usually one second - it stimulates either the atrium or the ventricle with a brief low voltage pulse. It will delay stimulating if it detects electrical activity. This detecting and stimulating action are referred to as "demand pacing" since it occurs on a beat-by-beat basis. When the upper

chambers of a dual-chamber device activate spontaneously or are stimulated, the gadget begins a countdown to guarantee that in an appropriate - and programmed - manner. There is an activation of the ventricle at the - interval; otherwise, an impulse will be provided again [7,8].

4. CONCLUSION

A 55-year-old female patient was admitted to the hospital with the chief complaint of breathlessness on exertion chest pain last 10 days. After all investigation patient was diagnosed with a case of permanent DDDR pacemaker. Now she is going to under a pacemaker procedure and treatment. Now patient prognosis is better than the previous and advises the patient for the regular 15 days follow-up.

INFORMED CONSENT

Patient informed consent was taken and signed by the Patient before writing a case report.

ETHICAL APPROVAL

We conducted our research after obtaining proper IEC approval.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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