IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Dietary Modifications After Coronary Artery Bypass Grafting With Mitral Valve Replacement

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Abstract: "The combination of Coronary Artery Bypass Grafting (CABG) with Mitral Valve Repair (MVR) has emerged as an integrated approach to address the dual challenges of coronary artery disease and mitral valve dysfunction. This abstract summarizes the Dietary modifications to be followed after the surgery and outcomes of the CABG +MVR procedure. The simultaneous repair of coronary arteries and mitral valve ensures optimal heart function and enhances patient quality of life. The patient must adhere to the recommended diet in order to preserve their health after the procedure. To keep their weight within a healthy range, they must primarily concentrate on consuming less fat and more fiber also consuming fewer sodium and sugar-containing products. In addition to diet moderate physical activity can effectively help the patient for achieving healthy lifestyle.

Index Terms - Coronary Artery Diseases(CAD),CABG, MVR, Acitrom/ Warfarin medicine, Diet, Physicalactivity, Restricted Vitamin-K, Low Sodium, Low Calories, Low Fat, Adequate Fiber, Heart-Lungmachine

I. INTRODUCTION

Cardiovascular diseases continue to be a significant cause of morbidity and mortality worldwide. Among the various treatment options available, surgical interventions play a vital role in managing complex cardiac conditions. In cases where patients present with both coronary artery disease and mitral valve dysfunction, the combination of Coronary Artery Bypass Grafting (CABG) and Mitral Valve Repair (MVR) offers a comprehensive solution. This article explores the integrated approach of CABG with MVR, highlighting its benefits and outcomes. The function of heart is to continuously circulate the blood throughout the body. The vessels that supply the body with oxygen-rich blood are called arteries and the vessels which return blood to the heart are called veins. Like any other muscles in the body, the heart depends on the steady supply of oxygen rich blood. The arteries, which carry blood to the heart, are called coronary arteries. Sometimes these blood vessels can be blocked due to the deposits of fats or other materials, overtime fat deposits can narrow the vessels and blood flow is restricted. In some cases the coronary arteries become so much narrow that the heart muscle is so in danger. In order to restore the normal blood flow CABG is performed,

CABG: Coronary Artery Bypass Grafting (CABG) is a surgical procedure that restores blood flow to the heart muscle by bypassing blocked or narrowed coronary arteries. In CABG, a healthy blood vessel, typically an artery or vein from the patient's own body is grafted onto the blocked coronary artery, allowing blood to bypass the obstruction and reach the heart muscle.

MVR: Mitral Valve Repair (MVR) is a surgical technique used to treat mitral valve regurgitation, a condition characterized by the backward flow of blood from the left ventricle into the left atrium due to a faulty mitral valve. During MVR, the surgeon repairs or reconstructs the damaged mitral valve, ensuring its proper functioning and preventing blood leakage.

Benefits of CABG with MVR: Single surgery, dual benefits: Combining CABG with MVR eliminates the need for separate surgeries, reducing overall procedural risks and hospital stays for patients. It saves time and enables a comprehensive treatment approach .Improved long- term out comes: Studies have shown that patients who undergo combined CABG with MVR experience better long-term survival rates compared to those who undergo isolated MVR. The simultaneous repair of coronary arteries and mitral valve leads to optimal heart function and improved quality of life. Synergistic effects: The integration of CABG with MVR allows surgeons to optimize the surgical plan and achieve a harmonious outcome. Addressing both coronary artery disease and mitral valve dysfunction in one procedure ensures a comprehensive approach to managing complex cardiac conditions. Reduced re operation rates: Performing CABG and MVR concurrently reduces the need for repeat surgeries in the future. This benefit is particularly important for patients who may be at higher risk or have limited access to health care facilities.

SYMPTOMS: Chestpain, Shortness of breath, Fatigue, Heart palpitations, Swollen ankles and feet, Tiredness ,Arrhythmia

SIDE EFFECTS AFTER THE SURGERY Pain and discomfort, Infection, Bleeding, Scarring , Fatigue, Breathing difficulties, Blood clots, Fluid retention.

SURGICAL PROCEDURE:

CABG is performed to improve circulation to the heart muscle. In this procedure a healthy artery or vein from the other part is connected or grafted to the blocked coronary artery, the grafted artery or vein bypasses the blocked portion of the coronary artery carrying oxygen rich blood to the heart muscle. Before the procedure an Intravenous line will be started and oral medication is given to feel relax and a general anesthesia is given which helps the patient to sleep for the duration of the operation. A breathing tube will be inserted through the mouth into the throat to improve breathe and a catheter will be placed in bladder to drain the urine.

CABG generally takes three to six hours. During this surgery a surgeon will begin by making and incision on the skin over the breast bone or sternum, he or she will cut the sternum and move the ribcage in order to get the heart. Throughout the procedure the circulatory system may be connected to a cardio pulmonary bypass pump, called heart lung machine. This machine may temporarily perform the functions of heart and lungs during the surgery allowing the heart to stop. A heart lung machine takes over the job of circulating and oxygenating the blood so that your doctor will be free to stop your heart for the length of the operation. To connect the heart lung machine one tube is placed into the aorta and a second tube is placed into the right atrium of the heart. One or two smaller tubes are then inserted into the heart. These will carry a special solution that helps preserve the heart's temperature. When all the tubes are in place, the surgical team will turn on the bypass machine. It will begin to circulate the blood, as the heart cools the cooled blood circulates through the heart, the heart muscle also cools, causing the heart to beat a slower pace. When the temperature of the heart muscle has reached the proper level a clamp is placed on the aorta at that point blood will no longer flow through the heart and it can be safely stopped and repaired to complete the bypass graft procedure, your doctor attaches the ends of the new vessels on either side of the diseased or areas of the old coronary artery. Once the Grafts have been completed, the clamp on the aorta is removed and the heart is allowed to begin beating again as the temperature and the rhythm of the heart slowly returned to normal, the heart lung machine is disconnected. The pericardium can now be closed over the heart. The surgeon will position two special drainage tubes in the chest cavity these tubes prevent fluid from building up around the heart during the healing process. The breast bone is then closed with metal wire and there maining tissue is closed with sutures. Finally, a sterile bandage is applied. The heart which is supposed to supply blood to the entire body is supported by a number of valves to perform its purpose and one of these valves is the mitral valve. The mitral valve is responsible for getting the blood from the lungs to the heart and then when heart pumps the blood into the body, these valves closes completely so that there is no leakage into the lungs. 50% of diseased mitral valves can be repaired instead of replacement. But sometimes in certain diseases, these valves get damaged and therefore it needs to be corrected. The traditional treatment, which has been there from decades, is to replace these valves with prosthetic valves, but the problems with having prosthetic valves are multiple, like it could be using of blood thinners frequent follow-ups with doctors and sometimes degeneration of these valves due to usage of bio prosthetic valves .Over the last two decades, techniques to repair these valves are developed and currently 50% of these mitral valves can be repaid. First it is important to identify the reason of leakage from the valves and it is important to see whether the valve’s leaflets have

shrunk or whether there is any defect in supporting structures and finally whether the valve attachment sizes have enlarged inhibiting it from closing properly. Once the problem is identified, by simple way like echocardiography following procedures can be planned. Once the surgeon understand the basic pathology and the basic underlying reason, for malfunctioning of these valves, appropriate corrective measures are taken to make afford these damages and deliver a good functioning Mitral valve.

CASE REPRESENTATION

A 68 years old male of weight about 90KG and height about 171cms and with BMI of30.8 was admitted in hospital with complaints of Fever spikes, chest, pain, and shortness of breath grade 3. According to his BMI, he was categorized as Overweight, the patient was Diabetic Hypertensive and he underwent Cholecystectomy and Prostatomegaly and Obstructive sleep apnea. Patient was diagnosed with Cardiovascular diseases: Triple vessel disease[TVD] CVD: ACS unstable Angina And mitral regurgitation[MR] The patient's biochemical parameters were normal and afebrile, When the patient is admitted in hospital, he was served with Diabetic and hypertensive normal diet and as patient was unable to tolerate dal, channa, chole, rajma, and Tamarind, these protein source foods are replaced with other protein sources, like Soya, Eggs, Sprouts and a Protein supplement like Ensure peptide powder.

The patient was NBM [Nil by mouth]on the day of surgery[CABD+MVR] And later patient was given with bread and milk after being Extubated and started on liquid diet, later on the patient was given with diabetic soft diet with low salt as the patient was hypertensive also the patient was on medication like ACITROM, Acitrom is a brand name for the medication warfarin, which is an anticoagulant or blood thinner. Warfarin is prescribed to prevent blood clots from forming or growing larger in the blood vessels or heart. It is commonly prescribed for conditions such as deep vein thrombosis (DVT), pulmonary embolism (PE), and a trial fibrillation. When taking Acitrom (warfarin), it is essential to follow certain dietary guidelines to ensure the medication works effectively and to minimize potential complications. Warfarin interacts with vitamin K, which is necessary for blood clotting. Therefore, maintaining a consistent intake of vitamin K is important to maintain a steady response to the medication.

Here are some dietary considerations: Consistent vitamin K intake: Vitamin K is found in green leafy vegetables, such as kale, spinach, broccoli, Brussels sprouts, and cabbage. It is crucial to maintain a consistent intake of vitamin K-rich foods and not drastically increase or decrease consumption. Moderate vitamin K intake: While it is important to have a consistent vitamin K intake, it is also advisable to avoid consuming extremely high amounts of vitamin K-rich foods. Consistency is the key, and sudden large increases in vitamin K intake can affect the medication's effectiveness. The patient was advised to take low vitamin K diet and also the patient was asked to avoid certain foods like Cabbage, Cauliflower, Beans, and Green leafy vegetables. The patient was able to tolerate the diet well without any complications.

During discharge, patient was advised to Include low Vitamin K, Moderate Calorie, High Protein, Adequate Fiber, low Fat and low Cholesterol ,low Sodium diet, along with it Foods like Chole, Dal, Channa and Tamarind are restricted as the patient cannot tolerate these Foods. Along with diet patient is advised to do some physical activity to be healthy.

RECOMMENDED DIETARY GUIDELINES TO BE FOLLOWED BY THE PATIENT

During the diet counseling patient was asked to eat his meals on time and to Take small and frequent meals and Drink plenty of water.

Coronary artery bypass graft (CABG) and mitral valve replacement (MVR) are major surgical procedures that require significant changes in dietary habits to promote healing and reduce the risk of complications. Here are some detailed notes on dietary modifications given for CABG with MVR patient Reduce Sodium Intake: CABG with MVR patients should limit their sodium intake to less than 2,300 milligrams per day to help reduce fluid retention, lower blood pressure and minimize the risk of heart disease. To achieve this, they should avoid or limit the intake of high-sodium foods such as processed meats, canned foods, frozen meals, and salty snacks. They should also try to cook with minimal salt and use other herbs and spices to add flavor to their food.

Increase Fiber Intake: High-fiber foods can help reduce cholesterol levels, promote bowel regularity, and prevent constipation, which is a common side effect to post-surgery medications.CABG with MVR patients should aim for at least 25-30 grams of fiber per day by incorporating whole-grain cereals, bread, fruits, vegetables, legumes, and nuts into their diet.

Choose Lean Proteins: Proteins are essential for healing and recovery after surgery, but not all proteins are created equal. CABG with MVR patients should choose lean proteins such as skinless chicken, fish, turkey,

tofu, and legumes over fatty cuts of meat. They should also avoid processed meats such as sausages, bacon, as they are high in sodium and saturated fat.

Include Healthy Fats: Healthy fats such as omega-3 fatty acids found in fatty fish, nuts, and seeds, can help reduce inflammation and promote heart health. CABG with MVR patients should include healthy fats in their diet but in moderation, as fats are high in calories.
They should also limit their intake of saturated and Transfats found in fried foods, baked goods, and fatty meats.
Limit Caffeine and Alcohol Intake: Caffeine and alcohol can interfere with sleep, increase anxiety, and affect the absorption of medications.
CABG with MVR patients should limit their intake of caffeine and alcohol or avoid them altogether, especially during the recovery period.
Maintain Adequate Hydration: Proper hydration is essential for wound healing, maintaining normal body temperature, and preventing constipation. CABG with MVR patients should aim to drink at least 8-10 glasses of water per day and avoid sugary drinks and excessive caffeine intake.

CONCLUSION

A 68 years old male was diagnosed with Cardiovascular Disease. Patient responded well by the given treatment and also followed the food intake advised. The Patient was discharged in stable and good condition. He was advised to follow the diet even in future to overcome and health complications.

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