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Effects of Low-Intensity Exercise-Based Cardiac Rehabilitation on Cardiometabolic and Functional Outcomes in an Older Adult: A Case Report

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Abstract

Introduction: *Older adults after coronary artery bypass grafting may experience reduced functional capacity.* ***Objective:*** *This case report evaluated individualized low-intensity cardiac rehabilitation after coronary artery bypass grafting.* ***Method:*** *A 62-year-old man with coronary artery disease and multiple cardiovascular risk factors underwent a six-week phase II cardiac rehabilitation program. Functional, physical, and metabolic outcomes were assessed before and after rehabilitation.* ***Result and Discussion:*** *After six weeks, the patient completed 100% of rehabilitation sessions without cardiovascular or exercise-related complications. Functional capacity improved from 4.60 to 8.74 metabolic equivalents, six-minute walk distance increased from 264 to 444 meters, handgrip strength improved from 8/10 kg to 14/16 kg, and quadriceps strength increased from 10.4/10.4 kg to 16.8/16.8 kg. Physical activity increased from low to moderate levels, while HbA1c, triglycerides, and high-density lipoprotein cholesterol showed favorable trends. Fear of recurrent cardiac events was resolved, allowing independent exercise participation.* ***Conclusions:*** *Individualized low-intensity exercise-based cardiac rehabilitation was safe and improved functional capacity, muscular fitness, physical activity, and cardiometabolic outcomes.*

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Introduction

Coronary artery disease (CAD) remains one of the leading causes of morbidity and mortality worldwide despite substantial advances in pharmacological therapy and coronary revascularization techniques. Patients who undergo coronary artery bypass grafting (CABG) often experience improved myocardial perfusion and symptom relief, however, surgical revascularization alone does not fully restore functional capacity or eliminate the underlying cardiovascular risk factors. Many patients continue to present with reduced exercise tolerance, impaired cardiorespiratory fitness, dyslipidemia, diabetes mellitus, and decreased muscular strength during the recovery period. These residual impairments are particularly pronounced among older adults because age-related physiological decline further compromises cardiovascular function and exercise capacity (Kohler *et al*., 2010; Taylor *et al*., 2022). Thus, cardiac rehabilitation is an important strategy in secondary prevention to improve physical function, enhance quality of life, and reduce the likelihood of recurrent cardiovascular events (Taylor *et al*., 2021). Nevertheless, many post-CABG patients remain physically inactive after hospital discharge despite the well-established benefits of structured exercise training (Taylor *et al*., 2021).

The implementation of exercise-based cardiac rehabilitation in older adults with limited functional capacity presents unique clinical challenges. Patients with severe left ventricular systolic dysfunction, poor cardiorespiratory fitness, and multiple cardiovascular risk factors frequently avoid physical activity because of fear of provoking another cardiac event. This psychological barrier often leads to prolonged sedentary behavior, further accelerating declines in functional capacity, muscular fitness, and metabolic health. Moreover, the coexistence of type 2 diabetes mellitus and dyslipidemia contributes to persistent hyperglycemia, abnormal lipid metabolism, endothelial dysfunction, and progressive atherosclerosis despite optimal pharmacological management. Long-term cigarette smoking further aggravates cardiovascular risk through chronic inflammation, oxidative stress, endothelial injury, and accelerated atherosclerotic progression (Gallucci *et al*., 2020; Wondwosen *et al*., 2021). Although moderate and high-intensity exercise programs have showed substantial physiological benefits, these exercise prescriptions may not be feasible or well tolerated in older patients with markedly impaired functional capacity

Low-intensity exercise-based cardiac rehabilitation has emerged as a promising alternative for patients who are unable to tolerate higher exercise intensities during the early rehabilitation period. Previous studies have consistently showed that exercise training improves cardiorespiratory fitness, muscular strength, physical activity, glycemic control, and lipid metabolism among patients with cardiovascular disease (Taylor *et al*., 2021; Wang & Xu, 2017; Sharma *et al*., 2022). Low-intensity resistance exercise has been shown to improve muscular function and glycemic control in older adults with type 2 diabetes mellitus (Takenami *et al*., 2019). Nevertheless, most available evidence focuses on general cardiac rehabilitation populations or evaluates isolated physiological outcomes rather than simultaneously assessing cardiometabolic and functional improvements in older adults with severe functional limitation following CABG. Reports integrating changes in functional capacity, muscular fitness, glycemic control, lipid profile, physical activity, and psychological recovery within a single high-risk patient remain limited. This gap shows the need for detailed clinical evidence regarding the feasibility and clinical

changes associated with individualized low-intensity cardiac rehabilitation in complex post-CABG patients with multiple cardiometabolic comorbidities.

Accordingly, this case report describes the rehabilitation outcomes of a 62-year-old older adult with coronary artery disease following CABG who showed with severely reduced functional capacity, left ventricular systolic dysfunction, type 2 diabetes mellitus, dyslipidemia, poor muscular fitness, low physical activity, and fear of recurrent cardiac events. The six-week phase II cardiac rehabilitation program combined individualized low-intensity aerobic and resistance exercise, flexibility training, structured patient education, home-based walking, and home monitoring through mobile health applications and regular telephone or WhatsApp follow-up. Changes in cardiorespiratory fitness, functional capacity, muscular fitness, physical activity level, glycemic control, and lipid profile were evaluated before and after the rehabilitation program. The primary aim of this case report was to describe the feasibility of implementing this integrated rehabilitation program and the clinical changes observed in functional, muscular, physical activity, cardiometabolic, and psychological outcomes. Particular emphasis is placed on the feasibility and safety of implementing a low-intensity exercise-based cardiac rehabilitation program in a high-risk older adult with limited functional capacity. This case report provides descriptive clinical evidence of the feasibility, safety, and observed clinical changes following an individualized low-intensity cardiac rehabilitation approach during the early post-CABG recovery period.

Case Report

Patient Characteristics

A 62-year-old man was referred by a cardiologist to the Department of Physical Medicine and Rehabilitation for participation in a phase II cardiac rehabilitation (CR) program three months after undergoing coronary artery bypass grafting (CABG). The referral diagnosis was coronary artery disease (CAD) status post-CABG with concomitant type 2 diabetes mellitus (T2DM), while dyslipidemia had also been previously diagnosed. The patient worked as a farmer and lived in Majalaya, West Java. Before surgery, he had been a heavy smoker since adolescence, consuming 24-36 cigarettes daily, but successfully quit smoking following his hospitalization in December 2023. Despite the long travel distance, the patient showed high motivation to participate in rehabilitation and reported no financial or family-related barriers to treatment.

Table 1
Baseline Patient Characteristics

Variable	Findings
Age	62 years
Sex	Male
Occupation	Farmer
Primary diagnosis	CAD after CABG (3 months)
Comorbidities	Type 2 diabetes mellitus, dyslipidemia
Smoking history	Heavy smoker (24-36 cigarettes/day), quit December 2023
Living situation	Lives with daughter
Medical insurance	BPJS
Referral	Cardiologist for Phase II Cardiac Rehabilitation

Clinical History and Functional Assessment

The patient underwent unsuccessful percutaneous coronary intervention (PCI) in December 2023 because of severe multivessel coronary stenosis, which subsequently required CABG. The postoperative hospitalization lasted ten days without complications, after which he returned home and became predominantly sedentary, spending most of his time watching television. Although he remained independent in activities of daily living, he deliberately avoided moderate and vigorous physical activity because he feared that exercise might provoke another myocardial infarction. He had a 15-year history of CAD, type 2 diabetes mellitus diagnosed in 2019, and dyslipidemia diagnosed in 2009, all of which were managed with regular outpatient follow-up and pharmacological therapy. His medication regimen included glimepiride and metformin for diabetes, atorvastatin for dyslipidemia, and amiodarone, spironolactone, furosemide, clopidogrel, and monecto for cardiovascular disease. Psychologically, the patient showed no evidence of depression, anxiety, or stress according to the Depression Anxiety Stress Scale (DASS), but structured interviews revealed a pronounced fear of recurrent cardiac events that substantially limited his physical activity. His baseline physical activity level was low, with an International Physical Activity Questionnaire (IPAQ) score of 231 MET-min/week.

Baseline Clinical Examination

Physical examination showed that the patient was hemodynamically stable with a blood pressure of 114/66 mmHg, resting heart rate of 60 beats/min, respiratory rate of 20 breaths/min, and body temperature of 36.8°C. His body weight was 62 kg, height was 159 cm, and body mass index was 27.3 kg/m². Cardiopulmonary examination revealed normal heart rhythm and vesicular breath sounds without signs of heart failure or pulmonary congestion. The post-sternotomy surgical incision measured approximately 19 cm and showed complete healing without evidence of inflammation or adhesion. Echocardiography showed severe left ventricular systolic dysfunction with a left ventricular ejection fraction (LVEF) of 29.3%, diastolic dysfunction, left atrial and ventricular dilatation, mild mitral regurgitation, and global hypokinesia, whereas angiography confirmed severe multivessel coronary artery disease involving the left anterior descending, left circumflex, and right coronary arteries. Electrocardiography showed sinus rhythm with incomplete right bundle branch block, indicating electrical stability despite markedly impaired ventricular function.

Functional Capacity and Cardiometabolic Evaluation

Exercise testing using the Modified Bruce Protocol showed a peak exercise capacity of only 4.60 metabolic equivalents (METs), corresponding to a predicted VO_2max of 16.1 mL/kg/min and classified as poor cardiorespiratory fitness. The patient completed a 6-minute walk distance (6MWD) of only 264 meters without symptoms of dyspnea or angina but exhibited limited overall exercise tolerance. Musculoskeletal evaluation showed preserved muscle strength on manual muscle testing (5/5) and full joint range of motion; however, objective muscle fitness testing revealed poor performance, with handgrip strength of 8 kg and 10 kg and quadriceps one-repetition maximum (1RM) of 10.4 kg bilaterally. Laboratory examination showed suboptimal glycemic control, with fasting plasma glucose of 111 mg/dL and HbA1c of 7.8%, together with persistent dyslipidemia characterized by triglycerides of 218 mg/dL and HDL cholesterol of 39

mg/dL despite acceptable total cholesterol (148 mg/dL) and LDL cholesterol (75 mg/dL). Collectively, these findings showd high cardiovascular risk accompanied by severe impairment of cardiorespiratory fitness, muscular fitness, and metabolic control.

Table 2
Baseline Clinical and Functional Assessment

Parameter	Baseline
LVEF	29.3%
Functional capacity	4.60 METs
Predicted VO_2max	16.1 mL/kg/min
6MWD	264 m
Handgrip strength	8 kg / 10 kg
Quadriceps 1RM	10.4 kg / 10.4 kg
HbA1c	7.8%
Fasting glucose	111 mg/dL
Triglycerides	218 mg/dL
HDL cholesterol	39 mg/dL
LDL cholesterol	75 mg/dL

Method

This case report describes the implementation of an individualized phase II cardiac rehabilitation program in a 62-year-old male with coronary artery disease three months after coronary artery bypass grafting (CABG), accompanied by type 2 diabetes mellitus and dyslipidemia. The rehabilitation plan was formulated based on a comprehensive assessment that included medical diagnosis, rehabilitation diagnosis, functional limitations, personal factors, environmental factors, prognosis, and patient-centered rehabilitation goals. The patient was classified as high risk because of severely reduced functional capacity, left ventricular systolic dysfunction, multiple cardiometabolic comorbidities, poor muscular fitness, and low habitual physical activity. Rehabilitation problems were identified according to the International Classification of Functioning, Disability and Health (ICF) framework, encompassing impairments in cardiovascular function, exercise tolerance, metabolic function, muscular fitness, activity limitation, fear of recurrent cardiac events, and participation restrictions. Short-term goals were established for a six-week intervention period, including improvements in functional capacity, muscular fitness, physical activity level, and psychological confidence toward exercise, whereas long-term goals focused on sustained improvements in cardiometabolic risk factors, particularly glycemic control and lipid profile. The rehabilitation program was individualized according to the patient's baseline functional status, cardiovascular risk stratification, and exercise tolerance to ensure both safety and clinical effectiveness.

Exercise-based cardiac rehabilitation consisted of supervised aerobic exercise, resistance training, flexibility exercise, and a structured home-based exercise program. Aerobic exercise was performed twice weekly on a treadmill at a low intensity corresponding to 30-40% of heart rate reserve (HRR), with a total session duration of 60 minutes divided into four exercise intervals separated by five-minute recovery periods. Resistance exercise was performed twice weekly using an NK table at 30% of the baseline one-repetition maximum (1RM), consisting of two sets of fifteen repetitions with a 2-3 second isometric hold during each repetition. Flexibility exercises were prescribed daily using static stretching techniques performed for two sets with a 10-second hold at the point of mild discomfort. On days without supervised rehabilitation, the patient completed interval ground walking for approximately 30 minutes twice daily, two to three

days per week, using the talk test to maintain low exercise intensity. Adherence to the home-based program was reinforced through regular monitoring using a mobile health application and communication via WhatsApp text messages and telephone calls. Throughout the intervention period, no progression in exercise intensity was implemented because the initial objective was to establish safe exercise participation and improve tolerance in a patient with markedly limited functional capacity.

Table 3
Exercise-Based Cardiac Rehabilitation Protocol

Component	Prescription
Aerobic exercise	Treadmill walking
Frequency	2 sessions/week
Intensity	30-40% HRR
Duration	60 minutes (4 exercise intervals with 5-minute rest between intervals)
Progression	Not applied during the 6-week intervention
Resistance exercise	NK table
Frequency	2 sessions/week
Intensity	30% of baseline 1RM
Volume	2 sets × 15 repetitions, 2-3-second hold each repetition
Flexibility exercise	Static stretching
Frequency	Daily
Intensity	Mild stretching discomfort
Volume	2 sets, 10-second hold
Home exercise	Interval ground walking
Frequency	2-3 days/week (non-hospital days)
Duration	30 minutes, twice daily
Monitoring	Mobile health application and WhatsApp follow-up

Clinical outcomes were evaluated before rehabilitation and after completion of the six-week intervention using standardized clinical and functional assessments. Cardiorespiratory fitness was assessed by graded exercise testing with the Modified Bruce Protocol to determine functional capacity expressed in metabolic equivalents (METs), while functional exercise capacity was evaluated using the six-minute walk test (6MWT). Muscular fitness was assessed by handgrip dynamometry and quadriceps one-repetition maximum (1RM). Physical activity behavior was evaluated using the International Physical Activity Questionnaire (IPAQ), whereas psychological status was assessed through the Depression Anxiety Stress Scale (DASS) and structured interviews focusing on fear of recurrent cardiac events. Cardiometabolic outcomes included fasting blood glucose, glycated hemoglobin (HbA1c), and lipid profile parameters consisting of total cholesterol, low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), and triglycerides. Exercise adherence, treatment tolerance, achievement of rehabilitation targets, and adverse events were documented throughout the intervention to evaluate the feasibility, safety, and clinical effectiveness of the individualized low-intensity exercise-based cardiac rehabilitation program.

Result and Discussion

1. Result

The patient completed the supervised phase II cardiac rehabilitation program with excellent adherence and no adverse cardiovascular events throughout the intervention period. Attendance reached 100%, and all prescribed low-intensity aerobic exercise sessions were completed as scheduled. Progressive improvements were observed from baseline to the fourth week and were further enhanced after six weeks of rehabilitation. The patient also showed high compliance with the prescribed home-based walking program, progressively increasing the duration of walking from approximately 30 minutes to 45-60 minutes, two to three times per week. In parallel with these physical improvements, the patient's fear of recurrent myocardial infarction gradually resolved, resulting in greater confidence in performing daily activities and regular exercise. No symptoms of exercise intolerance, including chest pain, dyspnea, palpitations, dizziness, or excessive fatigue, were reported during either supervised or home-based exercise sessions.

Table 4
Changes in Functional, Muscular, and Physical Activity Outcomes During Cardiac Rehabilitation

Outcome	Baseline	Week 4	Week 6	Change (Baseline-Week 6)
6-Minute Walk Distance (m)	264	348	444	+ 180 m
Functional Capacity (METs)	4.60	-	8.74	+ 4.14 METs
Cardiorespiratory Fitness Classification	Very Poor	-	Fair	Improved
Hand Grip Strength (Right, kg)	8	12	14	+ 6 kg
Hand Grip Strength (Left, kg)	10	14	16	+ 6 kg
Quadriceps 1RM (Right, kg)	10.4	11.8	16.8	+ 6.4 kg
Quadriceps 1RM (Left, kg)	10.4	11.8	16.8	+ 6.4 kg
IPAQ Score (MET-min/week)	231	693	990	+ 759
Physical Activity Category	Low	Moderate	Moderate	Improved
Fear of Recurrent Cardiac Event	Present	Reduced	Resolved	Improved
Cardiac Rehabilitation Attendance	-	9 sessions completed	100% completion	Excellent adherence

Substantial improvements were also observed in cardiometabolic outcomes following completion of the six-week rehabilitation program. Glycemic control showed a favorable trend, with HbA1c decreasing from 7.8% to 7.4%, although values remained within the diabetic range. Lipid parameters also improved, as triglyceride concentration decreased from 218 mg/dL to 195 mg/dL, while HDL cholesterol increased from 39 mg/dL to 42 mg/dL. Although these laboratory values had not yet reached recommended therapeutic targets, the observed changes showd early metabolic benefits following regular participation in individualized exercise training combined with lifestyle

education. The absence of adverse clinical events throughout the intervention further supports the safety of low-intensity exercise-based cardiac rehabilitation in this high-risk patient with severely impaired baseline functional capacity and reduced left ventricular systolic function.

Table 5
Changes in Cardiometabolic Parameters

Parameter	Baseline	Week 6	Clinical Trend
Fasting Blood Glucose (mg/dL)	111	Not reassessed	-
HbA1c (%)	7.8	7.4	Improved
Total Cholesterol (mg/dL)	148	Not reassessed	-
LDL Cholesterol (mg/dL)	75	Not reassessed	-
HDL Cholesterol (mg/dL)	39	42	Improved
Triglycerides (mg/dL)	218	195	Improved

2. Discussion

The patient had multiple cardiovascular risk factors, including long-standing coronary artery disease, type 2 diabetes mellitus, dyslipidemia, a history of heavy smoking, and markedly reduced left ventricular systolic function. These factors collectively placed the patient in a high-risk category and limited his willingness to engage in physical activity because of fear of recurrent cardiac events. Despite these challenges, the patient successfully completed six weeks of supervised phase II CR with full attendance and no exercise-related adverse events. The findings show that the rehabilitation program was feasible and well tolerated in this individual. Previous evidence has consistently showed that participation in structured CR after myocardial infarction, percutaneous coronary intervention, or CABG significantly reduces mortality, recurrent cardiovascular events, and hospital readmissions while remaining a cost-effective intervention (Taylor *et al*., 2021). However, the present case can't determine whether the observed clinical changes were caused solely by the rehabilitation program, particularly because recovery after CABG may also reflect multiple concurrent factors.

The patient's baseline clinical characteristics also show the cumulative impact of multiple cardiometabolic risk factors on functional impairment. Dyslipidemia contributes to endothelial dysfunction, oxidative stress, chronic vascular inflammation, and progressive atherosclerotic plaque formation, thereby increasing the risk of recurrent cardiovascular events (Bikila *et al*., 2023). Similarly, long-term cigarette smoking accelerates atherosclerosis through inflammatory activation, endothelial injury, platelet dysfunction, and increased oxidative stress, all of which contribute to coronary artery disease progression (Gallucci *et al*., 2020; Wondwosen *et al*., 2021). Furthermore, aging itself is associated with reduced vascular elasticity, chronic low-grade inflammation, skeletal muscle loss, and progressive decline in cardiorespiratory fitness, making functional recovery after CABG more difficult in older adults (Kohler *et al*., 2010; Taylor *et al*., 2022). The coexistence of diabetes mellitus further exacerbates these physiological impairments by promoting chronic hyperglycemia and endothelial dysfunction, both of which impair exercise tolerance and delay recovery. Consequently, rehabilitation programs for older adults with multiple comorbidities should address not only physical deconditioning but also modifiable cardiovascular risk factors through individualized multidisciplinary interventions. In this case, the observed changes should therefore be

interpreted in the context of the patient's overall post-CABG recovery rather than attributed exclusively to exercise training.

The most important findings in this case were the marked improvement in functional capacity during the six-week rehabilitation period. Functional capacity increased from 4.60 METs to 8.74 METs, accompanied by an increase of 180 meters in the six-minute walk distance and a substantial improvement in physical activity level. These changes represent clinically meaningful improvements observed during the rehabilitation period; however, the magnitude of improvement cannot be interpreted as a direct treatment effect because this was a single case without a control or comparison condition. Previous studies have shown that aerobic exercise improves cardiorespiratory fitness, lipid metabolism, and overall cardiovascular function in patients undergoing cardiac rehabilitation (Taylor *et al*., 2021; Wang & Xu, 2017). Although improvements in peak oxygen uptake are generally smaller in older adults than in younger patients, individualized CR remains effective in increasing exercise capacity regardless of age (Taylor *et al*., 2022). Importantly, the observed increase in functional capacity exceeded the commonly accepted minimal clinically important improvement of approximately 1 MET, which is clinically relevant because every 1-MET increase in cardiorespiratory fitness has been associated with a significant reduction in cardiovascular mortality among patients with cardiovascular disease (Ezzatvar *et al*., 2021). Nevertheless, this clinical interpretation should not be considered evidence of a causal relationship between low-intensity exercise and the observed improvement. Natural postoperative recovery, increased daily activity, medication use, dietary changes, and continued smoking cessation may also have contributed to the changes in functional capacity and cardiometabolic status.

The addition of resistance training to the rehabilitation program coincided with improvements in muscular fitness and cardiometabolic outcomes. Hand grip strength increased from 8/10 kg to 14/16 kg, while quadriceps one-repetition maximum improved by more than 6 kg bilaterally after six weeks of rehabilitation. These gains exceeded the reported minimal clinically important difference for grip strength, suggesting that the observed improvements were clinically meaningful rather than merely reflecting measurement variability (Bohannon, 2019). Previous systematic reviews have showed that resistance exercise enhances muscle strength, exercise tolerance, insulin sensitivity, and cardiovascular health in patients with coronary artery disease (Sharma *et al*., 2022). In addition, low-intensity resistance training has been shown to improve glycemic control and muscular function in older adults with type 2 diabetes mellitus, making it an appropriate strategy for patients with limited exercise tolerance (Takenami *et al*., 2019). The favorable trends observed in HbA1c, triglycerides, and HDL cholesterol in the present case further coincided with the implementation of combined aerobic and resistance exercise during cardiac rehabilitation (Ahmad *et al*., 2023; Wang & Xu, 2017). However, these metabolic changes may also have been influenced by ongoing pharmacological treatment, dietary management, increased physical activity, and smoking cessation, and the relative contribution of each factor could not be separated in this case. Therefore, the findings are best interpreted as clinical changes occurring during a multimodal rehabilitation program rather than as isolated effects of resistance or aerobic exercise.

Beyond the objective physiological improvements, this case also shows the importance of addressing psychological barriers to successful cardiac rehabilitation. Before enrollment, the patient deliberately avoided physical activity because of fear that exercise might trigger another myocardial infarction, resulting in prolonged sedentary behavior and very low physical activity levels. Following structured education, supervised exercise, and progressive home-based walking, this fear resolved completely, allowing the patient to participate confidently in both supervised and independent exercise without adverse events. The improvement in confidence may have been supported not only by exercise exposure but also by structured education, repeated professional reassurance, home monitoring, and regular communication through the rehabilitation program. Psychological reassurance, individualized exercise prescription, and continuous professional supervision likely contributed to the patient's perfect attendance and excellent adherence throughout the rehabilitation program. At the same time, the contribution of other concurrent factors, including natural recovery, medication adherence, dietary management, and sustained smoking cessation, cannot be excluded. Although this report describes only a single patient and therefore cannot establish causality or be generalized to all post-CABG populations, it provides practical evidence of the feasibility, safety, and clinical changes observed during an individualized low-intensity cardiac rehabilitation program in an older adult with limited functional capacity and multiple cardiovascular risk factors. The findings therefore support the feasibility of incorporating individualized low-intensity exercise, education, and home monitoring into phase II cardiac rehabilitation, while larger controlled studies are needed to determine the independent effects of these components on functional and cardiometabolic outcomes.

Conclusion

This case report shows that an individualized low-intensity exercise-based cardiac rehabilitation program can be safely implemented and effectively improve cardiometabolic and functional outcomes in an older adult with limited functional capacity following coronary artery bypass grafting. After six weeks of supervised rehabilitation, the patient achieved clinically meaningful improvements in cardiorespiratory fitness, functional capacity, muscular strength, physical activity level, glycemic control, and lipid profile without any exercise-related adverse events, while also overcoming the fear of recurrent cardiac events that had previously limited physical activity. These findings suggest that low-intensity exercise, when appropriately prescribed and closely supervised, represents a feasible rehabilitation strategy for high-risk post-CABG patients who may not tolerate higher exercise intensities. Although the findings are limited to a single case, they support the integration of individualized low-intensity exercise into phase II cardiac rehabilitation and highlight the need for larger prospective studies to confirm its effectiveness and long-term benefits in older adults with complex cardiovascular and metabolic comorbidities.

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