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Case Report

Physiotherapy Section

Role of Mental Imagery in the Post-operative Management of CABG: A Case Report

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ABSTRACT

Patients recuperating after Coronary Artery Bypass Grafting (CABG) frequently experience psychological distress, such as worry and anxiety, which can have a negative impact on long-term survival, quality of life, and rehabilitation results. Integrating mind-body techniques may offer extra advantages, even if traditional physiotherapy focusses on physical rehabilitation. This report showcases a unique case showing how mental imagery improved a 78-year-old man's physical performance, tension, anxiety, and discomfort after CABG surgery. Over the course of four weeks, the intervention included regular physiotherapy sessions along with guided visualisation techniques. Assessment conducted after the intervention showed a considerable increase in physical performance, a significant reduction in stress and anxiety, and a significant alleviation of pain. This case demonstrates how mental imagery can be used as a comprehensive approach to improve emotional health, encourage physical healing, and possibly lower psychologically related morbidity and mortality in post-CABG rehabilitation programmes.

Keywords: Cardiac rehabilitation, Cognitive, Coronary artery bypass grafting, Psychological parameters

CASE REPORT

The patient was a 78-year-old male who had been diagnosed with triple-vessel coronary artery disease, for which he underwent Coronary Artery Bypass Grafting (CABG). The surgical intervention involved the use of three grafts: two harvested from the saphenous vein and one from the internal mammary artery. His medical history was significant for hypertension and seizures. He had been taking amlodipine and losartan for the past 10 years to manage his blood pressure. Additionally, he had a three-year history of seizures, managed with levetiracetam. His last documented seizure had occurred on 4th March 2024. Prior to initiating the study protocol, informed consent was obtained from the patient.

On observation, an incisional wound was noted on the sternum and bilateral lower limbs, the latter due to graft harvesting. The chest was symmetrical with a normal breathing pattern and stable vitals. Moderate pain was noted around the sternal stitches on palpation. Muscle tone and range of motion in all limbs were normal, with no sensory deficits. The patient showed signs of post-surgical anxiety and stress.

Echocardiography showed a left ventricular function of 55%. In the first week, baseline parameters were taken; stress and anxiety were measured through the Depression, Anxiety, and Stress Scale (DASS-21), pain was measured using the Visual Analogue Scale (VAS), and functional capacity was measured through the 6-minute walk test.

The Depression Anxiety and Stress Scale-21 (DASS-21) was used postoperatively to assess the patient's psychological status. This 21-item self-report tool, divided into depression, anxiety, and stress domains, rated symptoms over the past week on a 4-point Likert scale. It has shown strong validity and reliability in both clinical and general populations [1]. Pain intensity was measured using the VAS, a 10-cm line ranging from "no pain" to "worst imaginable pain," widely recognised for its sensitivity in clinical and research settings [2].

The patient was given a four-week intervention of mental imagery and physical therapy along with the medicines. Visualisation techniques were used as one of the mental imagery techniques. Guided imagery, a technique of visualisation, was employed to help stabilise blood pressure and heart rate by enhancing parasympathetic activity and regulating autonomic nervous system responses. This method also contributed to emotional well-being and facilitated neuroplastic changes, both crucial for recovery after surgery. Sessions included guided scripts delivered via audio recordings, leading the patient through calming imagery and positive recovery scenarios. The patient practiced guided imagery by visualising vascular healing, efficient heart function, and performing daily activities such as walking, stair climbing, and self-care. These sessions aimed to enhance recovery, promote neuroplasticity, and improve confidence in movement. Each session, lasting 15-20 minutes, involved 10 repetitions of mental imagery, performed twice daily.

Physical therapy included incentive spirometry (10 repetitions, 5 times/day), deep breathing (10 repetitions, 5 times/day), trunk mobility exercises (twice daily), and supervised ambulation (progressing from 5 to 30 minutes). Medications included Amlodipine 5 mg once daily, Losartan 50 mg once daily, and Levetiracetam 500 mg twice daily [Table/Fig-1].

Week 1	Duration	Week 2-4	Duration
Incentive spirometer	10 repetitions 5 times a day	Trunk mobility exercises	10 repetitions 2 times a day
Deep breathing exercises	10 repetitions 5 times a day	Incentive spirometer+Deep breathing exercises	10 repetitions 5 times a day
Mental imagery	5-10 minutes twice a day	Mental imagery	10 repetitions 2 times a day
Ambulation	5 minutes twice a day	Ambulation	5-30 min/day, progressively increasing

[Table/Fig-1]: Postoperative rehabilitation interventions administered following CABG.

After four weeks of intervention, the patient showed significant improvements in stress, anxiety, and functional capacity. [Table/Fig-2]. Patient performance on the spirometer and ambulation is shown in [Table/Fig-3,4], respectively.

	Pre intervention	Post intervention
VAS	7	1
Stress (DASS 21)	18	4
Anxiety (DASS 21)	20	6
6-minute walk test	180 metres	550 metres

[Table/Fig-2]: Results of postoperative rehabilitation following CABG.



[Table/Fig-3]: Patient doing ambulation.



[Table/Fig-4]: Patient performing with an incentive spirometer.

DISCUSSION

CABG is a common surgical procedure that frequently causes severe psychological stress and anxiety in the postoperative phase. Controlling these psychological reactions is essential because they can affect patient adherence, physical healing, and general quality of life. To further understand how mental imagery can help CABG patients manage their postoperative stress and anxiety, we conducted this study. This study aligns with the previous studies where the researchers found that relaxation, along with guided imagery, had a positive effect on postsurgical anxiety [3,4]. Recently, there has been a growing shift toward non-pharmacological interventions for managing psychological stress and anxiety, with relaxation-based strategies emerging as prominent approaches. These techniques not only help in reducing autonomic arousal but also foster a sense of control and calm, often serving as a counterbalance to distressing situations such as postoperative anxiety [5]. Among the commonly utilised methods are progressive muscle relaxation, guided imagery, Benson's relaxation response, deep breathing, selective relaxation, and meditation, each demonstrating varying degrees of effectiveness in different clinical populations [6].

The study's main intervention, Guided Imagery (GI), is a relaxing technique that encourages people to visualise peaceful, pleasant situations or experiences in order to activate the mind-body connection. This sensory-rich method lowers sympathetic nervous system activity by stimulating several brain regions and eliciting a relaxing response [7]. When the body is guided to visualise lovely and alluring scenery, endorphins are released, which results in a sense of calm and the elimination of anxious thoughts, which in turn leads to bliss [8]. This neurochemical response helps reduce anxiety, promote relaxation, and create a sense of emotional well-being. Usually performed in a quiet setting with the patient in a comfortable position, guided imagery can be given in a number of ways, including professionally led sessions, self-directed exercises, or pre-recorded audio [9]. Guided imagery, like hypnosis or meditation, is frequently paired with music and relaxation methods like progressive muscle relaxation or deep breathing [10]. Visualising functional movements not only promotes early mobilisation but also helps reduce the risk of post-surgical complications like pulmonary infection and deep vein thrombosis [11]. In one of the studies, they found that in guided imagery, integrating the mind and body can help people relax and lessen stress, anxiety, and depression [7]. Additionally, guided imagery is a complementary medicine technique that can be used to enhance quality of life and lower cancer rates in a variety of groups and conditions [9,12]. In our study, the patient's functional capacity improved significantly, as shown by better performance in the six-minute walk test. This may be attributed to increased gamma activity during motor imagery [13]. In conjunction with mental imagery, physical therapy interventions were incorporated to support recovery. These included incentive spirometry, deep breathing exercises, trunk mobility drills, and graded ambulation to enhance pulmonary hygiene, improve cardiopulmonary function, and promote early functional recovery. While functional independence typically returns within 6 to 12 weeks [14], this patient met key goals in just 4 weeks, highlighting the potential benefits of incorporating guided imagery into rehabilitation.

In many modalities, sports, and motor activities, employing mental imaging in conjunction with physical practice appears to have the biggest impact on performance. However, mental imagery alone or when used in conjunction with other cognitive methods has also been demonstrated to have notable performance-enhancing effects [15].

While this case suggests that mental imagery may support recovery after CABG by reducing anxiety and pain and improving function, its single-subject design limits generalisability. Without a control group, the effects cannot be solely attributed to the intervention due to possible confounding factors like motivation or medication adherence. Larger randomised controlled trials with long-term follow-up are needed to confirm these findings and evaluate their broader relevance.

CONCLUSION(S)

This case highlights the potential of mental imagery as an effective, low-cost, non-invasive adjunct to post-CABG rehabilitation. By reducing anxiety and enhancing emotional well-being, it supports a more holistic, patient-centred approach to recovery. Mental imagery empowers patients with greater self-efficacy and engagement in their healing process. While promising, these findings warrant validation through larger, controlled studies to establish standardised protocols and long-term outcomes.

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