

Impact of Prompt Exercise Program on Functional Level and Quality of Life After Tricuspid Valve Repair with the Cyst. A Case Report

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Abstract:

Heart valve disease is potentially fatal once symptoms appear, and it has a significant impact on the daily life and health-related quality of life of patients. Surgical therapy, consisting of the replacement or repair of valves, is still the preferred method of treatment. Tricuspid valve disorder is a common ailment that is still poorly treated. Surgical tricuspid restoration is only performed on selected patients. The incidence of blood-filled cysts either single or multiple on the valves of the heart is rare in older children and adults. A 33-year-old housewife presented with complaints of dyspnea, heaviness of both limbs and occasional palpitations. After the echocardiography and MRI, she was diagnosed with a tricuspid valve blood cyst for which she underwent surgery. We believe that following heart valve surgery, immediate enrollment in cardiac rehabilitation programs will improve functional capacity and self-efficacy while also lowering hospitalization and healthcare burden. After surgery, cardiac rehabilitation was started to reverse the symptoms of deconditioning and resolve the complaints of dyspnea and weakness. The patient's cardiac rehabilitation consists of an inpatient and home exercise program along with complete patient education and follow-up. It was concluded that cardiac rehabilitation effectively resolved the dyspnea and increased the patient's exercise tolerance capacity. It made the patient functionally independent. The patient regained her strength more quickly after surgery than expected.

Keywords: Complex cyst excision and Tricuspid Valve repair, Exercise program, quality of life.

INTRODUCTION

Cardiac hydatid lesions are infrequent, and are difficult to treat due to their unpredictability and variety. A three-layered cyst formation is the defining characteristic of this medical condition in individuals. Though cysts are most frequently observed in the lungs and liver. Cardiac involvement is exceedingly uncommon, comprising a mere 0.01% to 2% of the total cases (1). Historically, the tricuspid valve has been referred to as the "neglected valve" due to the fact that the majority of patients recover from right ventricular dysfunction more quickly and safely than from left ventricular dysfunction. Consequently, tricuspid valve surgery has become more prevalent in an effort to enhance survival rates and overall quality of life. It is a prevalent ailment that is presently undertreated. Rarely performed on patients, the isolated surgical tricuspid repair is correlated with unfavorable outcomes, especially among those with a prior cardiac surgery history. Notwithstanding the impact of severe tricuspid

regurgitation on long-term health survival and functional status, the majority of patients receive solely medical treatment. (2) In 1844, Elsasser initially identified the blood cyst of the heart. Diverse origin and causative factor hypotheses have been examined in relation to the development of these lesions. Cysts predominantly arise from congenital sources. They are typically solitary or multiple and diminutive in size. These cysts are deemed to be benign lesions and should only be surgically removed if they develop complications. (3) The lungs and liver are where the lesions develop. Involvement of the heart is uncommon and frequently affects the tricuspid valve.

Such cysts, however, spontaneously regress in most of the patients and are rare in adults. In the elderly, the perseverance of cysts will cause them to reach a large diameter of up to 40 mm and lead to cardiac failure. (4). Cardiopulmonary bypass (CPB) is the treatment of choice for cardiac cyst excision. (1). Immediate pre and post-operative cardiac rehabilitation along with medical

management helps in reducing symptoms and decreases the chances of secondary complications in such patients.

Case Report

A 33-year-old housewife came with chest aches and dyspnea for 2 months to MGM School of Physiotherapy OPD, which was insidious in onset and was progressive from grade 1 to 3 on the New York Heart Association (NYHA) scale(5), which used to get aggravated during household activity as well as during stair climbing and relieved on rest. Occasional palpitations were present. She also complained of heaviness in both lower limbs along with poor weight gain. Her sleep was disturbed, socio-economic status was upper-middle-class according to the modified kuppuswamy scale(6). The build of a patient was ectomorphic. There was no history of cardiac disease or tuberculosis. Physical examination revealed bilateral crepitations, a high-pitched systolic murmur heard in the basal area of the lungs and the right lower sternal region as well as bilateral pedal edema.

Clinical findings:

Postoperatively the patient was conscious co-operative. Her general appearance was acutely ill and her build was ectomorphic. Incisional pain over the midsternal region was dull aching, diffuse, and intermittent with a visual

analog scale (VAS)(7) score of 4/10 during rest and 7/10 during movement. Her nutritional status was poor. The patient had good sitting and standing to sit balance. There was the use of accessory muscles while breathing with the respiratory rate was 10 breath/min along with decreased chest expansion.

On examination, she was hemodynamically stable, alert, oriented, and willing to participate in physical therapy. The blood pressure of the patient was 110/77 mm Hg and the pulse rate was 92 beats/minute; the respiratory rate was 10 breaths/minute, with abdominal breathing. SpO₂ was 94%. Auscultation revealed a systolic murmur heard in the right lower sternal region. On percussion over the lungs area, dull sound was noted. The trachea was a mild sideways shift to the left side of effusion.

Cardiac MRI reveals a well-defined, rounded cystic lesion of approx. size 3.6x2.7x3.1 in the region of tricuspid valve abutting inter-ventricular septum suggestive of complex cyst resulting in the collapse of right ventricle & dilation of the right atrium. 2D Echocardiography shows large cystic mass obstructing tricuspid valve, dilated right atrium, and moderate pericardial effusion.

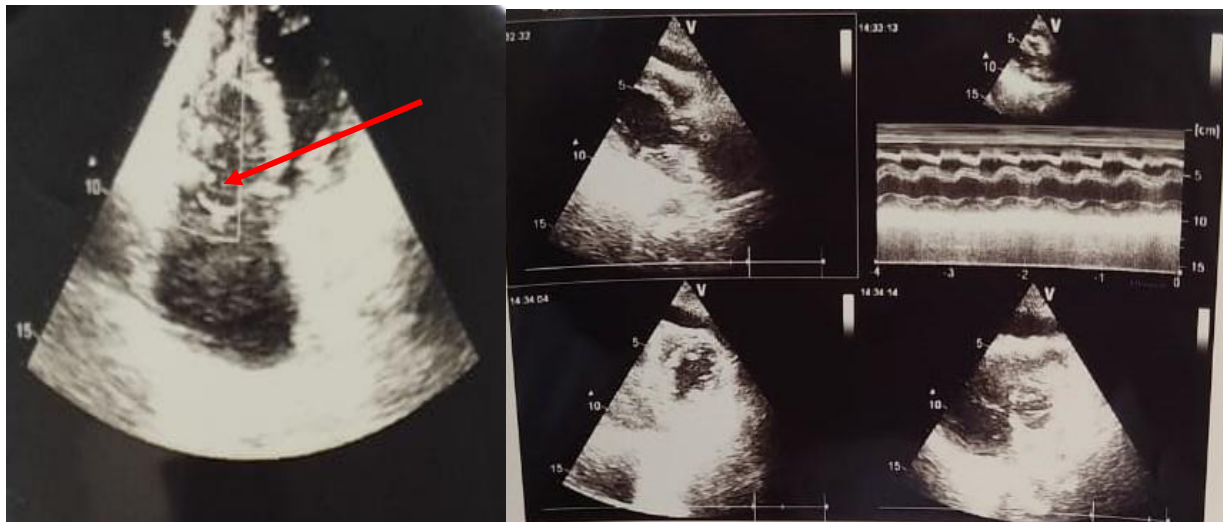


Fig. 1

Figure. 2

Fig. 1 and 2: Showing 2D echocardiography suggestive of large cystic mass obstructing tricuspid valve.

PHYSIOTHERAPY MANAGEMENT:

The cardiac rehabilitation program began with patient education, in which we discussed the value of exercise and how to understand adverse effects associated with physical activity, as well as risk factor modification strategies, social support, and collaboration with other team members. The comprehensive exercise program mentioned below as per the standard guidelines Before and after treatment followed with recovery, we monitor activity tolerance and hemodynamic response.

Post-operatively day -1, the patient was in the Cardiovascular and thoracic surgery ICU and was hemodynamically stable. Physiotherapy was started after the first 24 hours of surgery. The patient was made comfortable and was asked to perform ankle pumps and deep breathing exercises. She was shifted from supine to sitting with her feet propped up on a stool and hands supported on table. Chair sitting was initiated for up to 15 minutes a few times a day, with the use of a reclining chair helping her to eventually return to an upright position along with the active upper limb and lower limb exercise was performed. Deep breathing exercises,

incentive spirometer along with splinted forced expiratory technique was taught. Room Ambulation was started after femoral line and ICD removal. Hemodynamic stability was tested by recording vital signs (Blood Pressure, Blood oxygen, and Respiration rate) 3–4 times a day, up to 5 minutes. She was taught to gradually increase her ambulation time rather than distance and to judge her ambulation by time rather than distance. 5–7 minutes of ambulation in the hall, 3–4 times a day with minimal support along with exercises for the trunk when standing. Progressive hall ambulation 15 minutes 3–4 times/day. Stair climbing, one step at a time up and down a full flight of stairs (9 as expected at home). Reviewed to see if the activity instructions were understood. She was started with graded, supervised and monitored mobilization on the bases of RPE and heart rate plus 20 from baseline.

Home exercise program initiated with functional activity involving a gradual increase in ambulation time. During

the first four to six weeks following surgery, patients walk for 20 to 30 minutes, once or twice daily. She was encouraged to walk comfortably. Rest and low-level movements, such as ambulation and lower limb and upper extremity mobility, are part of her exercise routine.

Follow up and Outcome measures:

The patient was observed every two weeks for two months. At the moment of discharge, dyspnea had improved (NYHA grade 1 improvement), and the pain sensations had decreased with a VAS score of 2/10 for activity engaging the upper limb. The patient managed to execute her activities of daily living independently and with minimal difficulty. The patient was observed via a telephone conversation to determine whether she required training or assistance. After a month of being discharged, the patient returned to the rehabilitation OPD with improved dyspnea and fatigue while performing activities of daily living.

Fig 3. Outcome Measures

Outcomes	Pre-Operative	Post-Operative Day -3	Discharge	Follow-Up
NYHA	3	-	2	1
Incision site pain/NPRS	-	5	1	0
Six-minute walk test	-	-	250m	360m
WHO-QOL BREF				
Physical	38/100		50/100	69/100
Psychological	56/100		56/100	75/100
Social Relationship Environment	50/100		54/100	54/100
	69/100		56/100	69/100
RPE while performing ADL and Ambulation	15		11	7

Discussion:

Intracardiac blood-filled cysts are typically asymptomatic and are seen predominantly in infants. During autopsy, they are found on cardiac valves in approximately 50% of infants below two months of age and are rarely found after two years of age. In more than half of the autopsy cases, they are multiple, and up to 20 co-existing cysts have been reported. Tricuspid valve cyst causing symptoms either pre-operatively or post-operatively adversely decline patient's quality of life irrespective of choice of treatment either repair or replacement. The clinical guideline for such patients emphasizing the importance of rehabilitation post valvular operation is still rare (6,7). The goal of cardiac rehabilitation is to improve an individual's exercise capacity, exercise efficiency, exercise tolerance, self-management, and improve quality of life. There is no consensus regarding the optimal management of asymptomatic cysts. However, in view of the potential complications, these blood cysts should be monitored with serial echocardiographic studies. Roberts et al proposed that the cyst should be removed routinely to exclude malignancy and to avoid the potential risk of

embolism. Others reserve surgical resection for those cystic masses that interfere with normal cardiac function(8).

We report the case of 33-year-old housewife with complaints of dyspnea, heaviness of both limbs and occasional palpitations. After the echocardiography and MRI, she was diagnosed with a tricuspid valve blood cyst for which she underwent surgery. In this case study, after surgery, cardiac rehabilitation was started to reverse the symptoms of deconditioning and resolve the complaints of dyspnea and weakness. The patient's cardiac rehabilitation consists of an inpatient and home exercise program along with complete patient education and follow-up. our patient was enrolled immediately for in-patient cardiac rehabilitation and there was tremendous recovery seen after 2 weeks of rehabilitation and home exercise program monitored telephonically following discharge. During follow up there was an improvement in dyspnoea, quality of living, and functional capacity. Similarly, Patel et al report that early enrolment of cardiac surgery patients in cardiac rehabilitation is correlated with lower re-hospitalization and mortality risks (9).

Early exercise program with the objective to achieve comfortable ADLS after discharge should be planned in post-operative heart surgery. Early supervised and monitored activities can be initiated during few days after post-operative period.

Conclusion: Cardiac Rehabilitation effectively resolved the dyspnea and increased the patient's exercise tolerance capacity. It made the patient functionally independent. The patient regained her strength more quickly after surgery than expected.

Informed consent: Proper consent was taken from the patient's parents for writing the case report.

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