

**EARLY MOBILISATION OF A COVID-19 PATIENT UNDERGONE DOUBLE VALVE REPLACEMENT: A CASE REPORT**<sup>1</sup>\*Aparna Pattnaik and <sup>2</sup>Nidhi Pande<sup>1,2</sup>Assistant Professor cum Clinical Physiotherapist, Abhinav Bindra Sports Medicine and Research Institute.**\*Corresponding Author: Aparna Pattnaik**

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**INTRODUCTION**

Noble coronavirus is well known for affecting the health status of any person.<sup>[1]</sup> It is also accountable for the decline in the economy, finance, health care and resources worldwide.<sup>[2]</sup> It is well known that during the corona pandemic all the health care systems were shut down which delayed cardiac surgeries and also deprived the quality of life of the patient which make them prone to suffer from noble coronavirus. Even at this pandemic to prevent the patient from getting more complications, few surgeries are mandatory and it is also necessary that we upgrade our rehabilitation program. The traditional method of treating patients undergoing major surgeries in the Intensive care unit is long term sedations, prolong bed rest and medications which can also lead to ICU acquired weakness and psychological depression. Initiating mobilisation in the early stage of rehabilitation is the new treatment protocol that has shown many benefits in the well-being of the patients and also improves the functional status and quality of life. This study was done to encourage the early mobilisation of the patient in ICU and to check their functional status at the time of discharge.

**CASE PRESENTATION**

A male aged 49 years old of average built, body mass index (BMI) of 19.7kg/m<sup>2</sup>, was received at Sunshine Hospital, Bhubaneswar, with a complaint of breathlessness, chest pain, abdominal discomfort and general body weakness for the last 15 days. The patient was on medication for epigastric pain for the last 5 days and it was also found that he was a drug addict (marijuana) for the last 25years and was highly stressed by his father's recent death. At the time of arrival, the vital reading was pulse rate 180beats/min, blood pressure – 90/60, saturation 98%, Glasgow coma scale-15 (GCS E4 V5 M6), respiratory rate- 30 beats/ min, temperature-98.6 degrees Fahrenheit, Visual Analogue Scale- 3/10. Patient was affected with noble coronavirus (covid 19) and RTPCR test reported SARS-COV-2 positive. No other signs of comorbidities were noticed.

On further investigation, Echocardiography study reported moderate Left Ventricle(LV) systolic function, left atrium dilated with spontaneous echo contrast, severe mitral stenosis (MS) and mitral regurgitation (MR) with calcified mitral valve (MV), moderate to severe aortic regurgitation (AR) with calcified aortic valve (AOV), moderate tricuspid regurgitation (TR), right ventricular systolic pressure = 42mmhg and left ventricular ejection fraction = 40%. Electrocardiography study read Atrial Fibrillation (AF). The complete blood count report was within the normal range. Coronary Angiography reported normal coronary and henceforth, medical management was recommended.

The patient was diagnosed with Rheumatic heart disease (RHD), severe MS/ MR, moderate TR, moderate to severe AR, AF, and therefore, double valve replacement (mitral valve and aortic valve) + TV repair surgery under general anaesthesia was conducted. Incision type: Midline sternotomy pericardial. The patient was referred to the physiotherapy department on POD 1for further management and rehabilitation.

The patient case was thoroughly studied, investigatory reports after surgery were checked and a complete cardiac assessment including physical and functional status was done. Following covid guidelines and gold standard guidelines for cardiac rehabilitation, the patient's treatment protocol was planned out and modified in consideration of our set-up. Vitals were noted both pre and post-session and any adverse effects were looked after.

On the first day of treatment, bedside exercises with low intensity were given to the patient which included inceptive spirometer, diaphragmatic breathing exercise, splinted coughing, active range of motion exercises of both upper limb and lower limb within the pain-free and available range with 20 repetitions, paper blowing exercise and ankle pump exercise. On the second day of treatment, in-bed mobilisation was included along with the previous exercise protocol. The patient was initiated to sit in the long sitting position with back support and then in a high sitting position with foot and hand support. The patient managed to sit for some time but again

complaint of tiredness to which the patient was brought back to his bed. On the third day of treatment, out-bed mobilisation was included along with the previous day protocol. The patient was encouraged to stand near the bed and then walk a few steps around the bed. The patient was cooperative and covered two rounds of walking. No adverse effect was noticed during the treatment period. Patient vitals were raised within the normal limit during the sessions and were stable. The patient was discharged from the intensive care unit and shifted to the indoor where his gait training and stair climbing training was done.

A further clinical assessment including inspiratory and expiratory capacity, physical and functional status was done. Physical activity readiness questionnaire (PARQ) was given to the patient and accordingly home exercise program was planned and taught to the patient and then discharged from the hospital. After one week of discharge, the patient was contacted via a phone call to which he confirmed a good recovery rate.

## DISCUSSION

A rheumatic heart disease patient with other complications and symptoms of dyspnea, easily fatigue and general body weakness approached our set up for medical treatment and tested SARS-COV2 positive. The investigation report demanded immediate medical intervention and rehabilitation. Cardiac surgeries have high mortality and morbidity rates, additional coronavirus make it worse.<sup>[3,4]</sup> Rehabilitation of a patient in the Intensive Care Unit (ICU) who has undergone double valve replacement and tricuspid repair surgery with positive SARS-COV2 was new and challenging in today's time.

Intense medical management for covid 19 patients in ICU which includes prolonged lung ventilation, sedation and neuromuscular blocking agents may be at high risk of developing ICU acquired weakness for which early rehabilitation should be encouraged and practiced.<sup>[5]</sup> Early mobilisation of patients undergoing cardiac surgery has been proved to be beneficial in early recovery and also helps in returning to work soon.<sup>[6]</sup> Studies have already proved the benefit and usefulness of early mobilisation yet it is not well practiced.<sup>[6]</sup> World Health Organisation (WHO) also encourages the early mobilisation of covid 19 patients or early in the course when safe to do so.<sup>[7]</sup>

A case study by Rio et al<sup>[8]</sup> talks about the exercise prescription and protocol of different phases done for a patient undergoing DVR and tricuspid valve repair. Phase 1 comprised of bedside exercises, Phase 2 included exercised determined after 6MWT and Phase 3 includes ADL. The patient showed a better recovery rate. An article by Righetti RF et al<sup>[9]</sup> and Thomas et al<sup>[5]</sup> talks about the guidelines and safety measures taken for the treatment of covid 19 patients during medical management. Physiotherapy plays a vital role in the

rehabilitation of covid patients. Awareness on PPE sheets and other preventive guidelines should be given to the medical fraternity and other staffs specifically to both reduce infection risk and provide the best patient care.

In reference to the above studies and ICU mobilisation guidelines by Preme et al<sup>[10]</sup> and Stiller et al<sup>[11]</sup>, a protocol was designed according to our set up which included bedside exercises with gradual progression of mobilisation. All external appliances, vitals and connections to the patients were looked at before and after treating the patients. Early mobilisation of the patient was feasible and no adverse effect was found during the study. However, the patient was kept in ICU for observation of any complications but no risk was noted.

After the RTPCR test report suggested negative covid 19, patient was shifted from covid ICU to ward; further training on endurance, improving respiratory capacity and stair climbing was given. To decide the intensity and pattern of the home exercise program, PARQ, a self-screening tool was used. As per the PARQ result, patient was competent enough to perform ADL independently and could perform low to medium intensity exercises. Henceforth, exercises were planned and demonstrated to the patient before discharge from the hospital. Patient was educated on importance of exercise and benefits of performing it on regular basis.

Initiating physiotherapeutic intervention on a RHD with SARS-COV2 patient undergoing DVR with TV repair surgery was beneficial as the patient gained his functional status in early stage. Apart from bedside exercises, early mobilisation is highly recommended as a part of early rehabilitation program and it is well known to prevent patients from ICU acquired weakness, increases the recovery rate and enhances the quality of life of the patient. Since this was single study, further metacentric studies can be done on larger population.

## CONCLUSION

Early mobilisation is recommended in ICU and should be encouraged in early rehabilitation. The result of Physical active readiness questionnaire showed a good prognosis on the health status of the patient and it is safe to say that early mobilisation benefits in improving the patient status suffering from ICU acquired weakness as well as COVID 19. It helped in improving the functional capacity, fitness and quality of life of this patient. Physiotherapy has always proven its importance in rehabilitation of cardiac surgeries patients and in management of SARS-COV2 patients. However, standard covid19 guidelines and safety measures should be followed before treating any patients.

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