



Case report

**Efficient results of physiotherapy rehabilitation in hydro pneumothorax****Vaishnavi Chawake, Pallavi R Bhakaney, Chaitanya A Kulkarni, Om C Wadhokar, Vaishnavi Yadav\***

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**ABSTRACT**

Hydro pneumothorax is a rare variant type of pneumothorax. It occurs when both free fluid and air within the pleural space. The goal in treating a hydro pneumothorax is to relieve the pressure on your lung, allowing it to re-expand. Treatment options may include observation, needle aspiration, chest tube insertion, non-surgical repair or surgery along with a very important role of physiotherapy. A 54-year-old male patient came to the hospital with a complaint of breathlessness (MMRC grade II), dry cough and high-grade fever since one month. The patient had a history of alcohol consumption and tobacco chewing since 10 years. Laboratory investigations showed WBC count 18,600/ml. Complete blood count gave normal results. The arterial blood gases revealed PO<sub>2</sub> as 69. Chest X-ray which showed fairly large opacities with fluid level in right side. The costophrenic angle on the right side is obliterated. Multiple, small patchy opacities are also seen in left lower zones. Along with these findings, there was contralateral mediastinal shift. Physiotherapy intervention included patient education, breathing retraining, airway clearance techniques, positioning, walking program with supplemented oxygen and psychological support. Outcome measures have shown improvement in functional independence and performance of activities of daily living. Physiotherapy management showed efficient results in improving the lung function, quality of life, inducing relaxation and early return to pre-disease life in patient with hydro pneumothorax.

**Keywords:** Hydro-pneumothorax, Pneumothorax, Physiotherapy, Rehabilitation.

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**INTRODUCTION**

Hydro pneumothorax is a rare variant type of pneumothorax. It occurs when both free fluid and air within the pleural space. Patients with hydro pneumothorax presented with symptoms and signs of cardiorespiratory distress along with cough, anorexia, and weight loss which alerted toward diagnosis. Extensive pleural fluid analysis and investigations including microbiological and biochemical work-up is the cornerstone in establishing etiological diagnosis in hydro pneumothorax. TB remains the most common etiology for hydro pneumothorax. ICD tube insertion remains the management along with antimicrobial chemotherapy [1]. The accumulation of fluid and air results in increased respiratory demands i.e. increased respiratory rate,

decreased chest expansion and dyspnea. Physiotherapy exercises i.e. conventional breathing exercises are suggested as they maintain chest expansion, decrease dyspnea and assist drainage of fluid. Physiotherapists aim to improve ventilation for people with respiratory disease, and approach this using a variety of techniques [2]. In the

pediatric population hydro pneumothorax has been associated with rupture of a diaphragmatic hernia after thoraco-centric and trauma and with infections such as tuberculosis. Physical examination reveals decreased breath sounds on the affected side and an audible succussion splash. The goal in treating a hydro pneumothorax is to relieve the pressure on your lung, allowing it to re-expand.

**Table 1:** Improvement observed in patient

Depending on the cause of the hydro pneumothorax, a second goal depends on the severity of the lung collapse and sometimes on your overall health [3]. Treatment options may include observation, needle aspiration, chest tube insertion, non-surgical repair or surgery.

**Patient information**

54-year-old male patient came with a complaint of breathlessness (MMRC grade II), dry cough and high-grade fever since one month. Along with the mentioned complaints, he also had generalized weakness since one month. Patient also reported loss of weight of about 2-3 kgs since the last month. Patient had undergone primary

treatment in the private hospital. Since he got no relief, he got admitted to the hospital. The patient had a stay of 6 weeks in the hospital.

### Clinical findings

On initial examination, the patient was febrile (103F) and pulse rate was 130 bpm, respiratory rate was 20bpm, BP was 135/63mmHg and SPO2-97% on 4lit O2. Respiratory evaluation revealed decreased breath sounds on right side and decreased fremitus and crepitation bilaterally. The patient gave a significant history of alcohol consumption and tobacco chewing since 10 years.

### Diagnostic assessment

Laboratory investigations showed WBC count 18,600/ml. Complete blood count gave normal results. The arterial blood gases revealed PO2 as 69.

Radiological assessment done was chest X-ray which showed fairly large opacities with fluid level in right side. The costophrenic angle on the right side is obliterated. Multiple, small patchy opacities are also seen in left lower zones. Along with these findings, there was contralateral mediastinal shift.

**Figure 1:** Chest X-ray showing Hydro pneumothorax



### Therapeutic intervention

Scales	Day 1	Week 3	Week 6
TUG(timed up and go)	Unable to perform	25 seconds	15 seconds
FIMS	Maximal assistance	Moderate assistance	Minimal assistance
2 MWT	Unable to perform	70 meters in 2 minutes	150 meters in 2 minutes
HADS	Severe depression and anxiety	Moderate depression and anxiety	Moderate depression and anxiety

Intercostal tube drainage was the first line of treatment. Chest tube was inserted at the right side to drain out the fluid. The chest tube inserted was remained in place for few days. The patient's call was noted for physiotherapy. On observation, the patient was using accessory muscles while breathing. On initial assessment, the patient was breathless (MMRC grade 2), pain at the tube insertion site, weakness, fatigue and psychological symptoms.

The goal of the patient was to resume his daily activities with minimal fatigue and least shortness of breath. Keeping the patient's goal in mind, our goal was to relieve dyspnea, relieve pain, improve

ventilation, induces relaxation and overall functional status [4]. The intervention strategy began from positioning. Good positioning helps preventing bed sores, facilitates drainage of secretions and improves ventilation. Half seated position (45 to 60 degrees) was promoted thrice a day for at least 10 minutes [5]. Patient and his relatives were counselled about the need and importance of performing exercises [6]. Breathing retraining exercises such as breathing control, pursed lip breathing, segmental breathing and diaphragmatic breathing was taught [7]. The frequency of exercises was fully controlled by the patient to avoid worsening effect of training. Airway secretion clearance techniques involved postural drainage positions and active cycle of breathing technique (ACBT). Chest PNF techniques such as applied manual pressure and intercostal stretch on the left sided lung was given to improve reflex respiratory movement response and increase the depth of breathing. The techniques were continued at more repetitions after the removal of chest tube drain. Along with the respiratory training, active limb exercises of both upper and lower limb were given. Monitored in-bed mobilization techniques were incorporated. Patient was progressed from bed side sitting to standing to spot walking [8]. As the patient's general condition was improved gradually, mild exercise training was started maintaining 3-4 on Borg's scale. Volume centered coach 2 incentive spirometer was prescribed and markings were recorded (changed from 400cc/sec to 600cc/sec to 800cc/sec to 1000cc/sec). Physiotherapy management has shown satisfactory results in regaining pulmonary function [9].

### Outcome measures

Outcome measures used included TUG (timed up and go test), FIMS (Functional independent measure score) and 2MWT (2 minute walk test) and HADS (Hospital anxiety and depression scale).

### DISCUSSION

Pneumothorax with hydro pneumothorax is an unusual form of pneumothorax. It occurs when the pleural space contains both free fluid and air. In infants, hydro pneumothorax has been linked to the rupture of a diaphragmatic hernia despite thoraco centric and trauma, as well as infections like tuberculosis. This case shows a patient's initial complaint of breathlessness (MMRC grade II), dry cough and high grade fever. General and systemic examination gave a clear picture of the condition which made it easy for the medical team to manage the patient's complains easily. Our patient was put on oxygen support initially and underwent the chest tube drainage. Medical management along with physiotherapy management has shown excellent results in improving the lung function of the patient.

### CONCLUSION

Well monitored in-patient physiotherapy management shows brilliant results in bettering the lung function, quality of life, inducing relaxation and early return to pre-disease life in patient with

hydro pneumothorax.

**Conflict of interest**

The authors declare that they have no conflict of interest

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**Author's Contribution**

All authors contributed equally for the study.

**Informed consent**

A proper informed consent was taken from the patient prior.

**REFERENCES**

1. Garrod R, Lasserson T, 2007. "Role of physiotherapy in the management of chronic lung diseases: An overview of systematic reviews". *Respiratory Medicine*. 101(12), 2429–36.
2. Varun Y, Ulhas J, Babaji G, 2019. "Profile of COPD patients attending at Acharya Vinoba Bhave Rural Hospital". *ejbps*. 6(6), 321-325.
3. Dhanashri G, Waqar M. N, Arti S, 2020. "A case report on impact of physiotherapy rehabilitation on post coronary artery bypass graft". *Medical Sciences*. 24(104), 1962-67.
4. Anushree P, Pratik P, Om C. W, Sakshi P. A, Waqar M. N, 2021. "Comparison of Muscle Length in Dominant Versus Non-Dominant Lower Extremity in Young Asymptomatic Individuals". *Jour. of Med. P'ceutical & Allied. Sci*. 10(5), 3569-3573. Jadhav U, Chawla D, Wagh P, Ghewade B, 2020. "A case of pulmonary tuberculosis with stroke: A rare presentation". *J Datta Meghe Inst Med Sci Univ*. 15, 665-8
5. Bott J, Blumenthal S, Buxton M, Ellum S, Falconer C, Garrod R, et al., 2009. "Guidelines for the physiotherapy management of the adult, medical, spontaneously breathing patient". *Thorax*. 64(1), 11–52.
6. Nellessen A, Hernandez NA, Pitta F, 2013. "Physiotherapy and rehabilitative interventions in patients with chronic respiratory diseases: exercise and non-exercise treatment". *Panminerva Med*. 55(2), 197–209.
7. Opdekamp C, Sergysels R. [Respiratory physiotherapy in lung diseases]. *Rev Med Brux*. 2003 Sep;24(4):A231-235.
8. Waqar M Naqvi, 2021. "Gamification as an entrepreneur well-being intervention: A study protocol for a single-blinded randomised controlled trial". 1323, v1.
9. Naqvi WM, Sahu A, 2020. "Paradigmatic Shift in the Education System in a Time of COVID 19". *jemds*. 9(27), 1974–6.

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