International Journal of Research in Medical Sciences
Pol TT et al. Int J Res Med Sci. 2026 Jul;14(7):3112-3117
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20262208

Case Report

Beyond Medication: Pulmonary rehabilitation in an older adult with non-cystic fibrosis bronchiectasis and allergic bronchopulmonary aspergillosis – a case report

Titiksha T. Pol[1,2]*, Jaimala V. Shetye[2]

[1]Department of Cardiovascular and Respiratory Physiotherapy, The SIA College of Health Sciences College of Physiotherapy, Dombivli, Thane, Maharashtra, India
[2]PT School and Centre Seth G.S. Medical College and KEM Hospital, Parel, Mumbai, Maharashtra, India

Received: 05 February 2026
Accepted: 06 June 2026

***Correspondence:**
Dr. Titiksha T. Pol,
E-mail: titikshapolphysio@gmail.com

ABSTRACT

Bronchiectasis results from a vicious cycle of pulmonary infection, airway inflammation and impaired mucociliary clearance, leading to abnormal and permanent dilatation of bronchi. Allergic bronchopulmonary aspergillosis (ABPA) is a common infection seen in adults with non-cystic fibrosis bronchiectasis. We present the short and long-term effects of Pulmonary rehabilitation (PR) and exercise training in a 69-year-old female with bronchiectasis. The patient's refusal to take any medication led to referral for physiotherapy, being a non-pharmacological treatment, as a last resort. PR was based on an individualised protocol, as determined by the physiotherapeutic assessment. Treatment included patient and family education, various breathing exercises, nutritional counselling, endurance, strength and functional activity training over a period of 6 months to 1 year. Significant improvement in functional capacity after 4 months of training, 1 min sit-to-stand (STS) count improved from 17/min to 30/min, Leichester quality of life (LCQ) total scores improved from 9.9/21 to 15.95/21. Single breath count (SBC) improved from 6 to 14. Improvements in the amount of sputum (5 tablespoons per bout, 8-10 times a day to 1-2 tablespoons per day), colour and consistency from P3 to M2 (Miller and Jones classification), with reduced frequency of coughing bouts. 1 year follow up showed further improvement in LCQ scores to 24.87, 1 min STS to 36 per minute and SBC to 24. Pulmonary rehabilitation plays a vital role in older patients diagnosed with bronchiectasis in improving physical, mental and social impairments, thereby contributing to improved quality of life.

Keywords: Exercise, Chronic respiratory disease, Elderly, Chest physiotherapy

INTRODUCTION

Bronchiectasis is the abnormal and permanent dilatation of the bronchi that occurs mostly following the vicious cycle of infection, leading to inflamed airways with impaired mucociliary clearance resulting in a structural lung disease.[1] Bronchiectasis in India is more severe in terms of aetiology as the patients are younger, most commonly men, and have a higher frequency of severe cystic bronchiectasis in comparison to their European counterparts. There is a higher burden of symptoms and frequency of hospital admissions in India as compared to other countries, namely the USA and Europe.[1] A history of tuberculosis is the most frequent underlying cause of bronchiectasis in the Indian population, followed by allergic bronchopulmonary aspergillosis (ABPA).[2]

Chronic coughing, with productive cough and frequent exacerbations, is the key feature in adults with bronchiectasis.[1] Pulmonary rehabilitation, when used as an adjunct to medical management, is the standard of practice because it is effective in alleviating distressing symptoms

and improving the overall quality of life in patients with bronchiectasis.[1,3-8]

CASE REPORT

We present the case of a 69-year-old female with a 20-year history of non-cystic fibrosis bronchiectasis since 2002, and a subsequent 9-year history of allergic bronchopulmonary aspergillosis (ABPA). Patient's consent was obtained before writing the case report. She was on regular medical treatment for the same for around 15 years after diagnosis, and on and off for a few years, consisting of a wide variety of pharmacotherapy for her variable symptoms (Table 1).

During the disease course, she experienced multiple exacerbations, including a superimposed Pseudomonas aeruginosa infection in 2014. She subsequently underwent two years of naturopathic therapy, with variable clinical outcomes. She had certain side effects like erythema, swelling, weight gain and easy fatiguability from a few medications, which adversely impacted her quality of life. Before the onset of her illness, the patient maintained a physically active lifestyle with regular participation in sports. Progressive deterioration in exercise capacity and the resultant difficulty in performing activities of daily living, led to reduced functional independence and health-related quality of life.

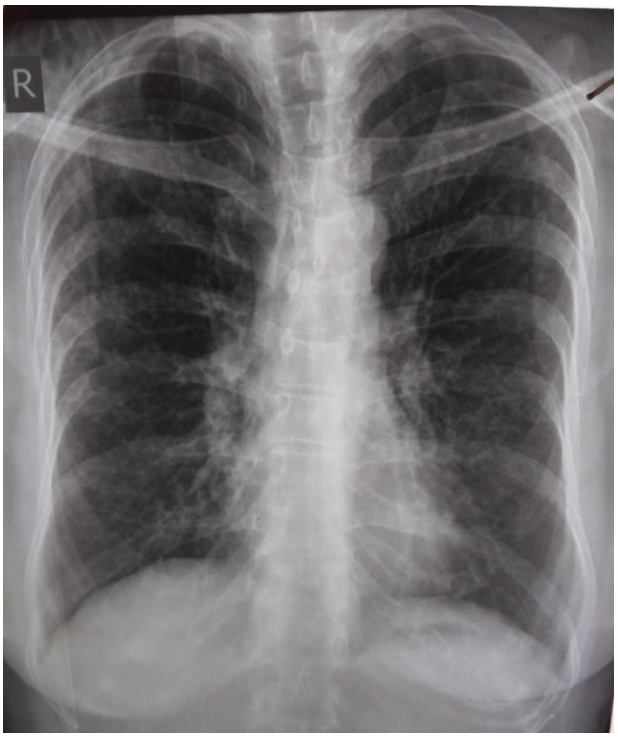

Figure 1: Chest X-ray.

The patient had severe side effects of medications in the form of weight gain, skin irritations, facial puffiness, hair loss, tingling numbness in the digits, hyperglycaemia, parotitis and increased fatigability.

The patient's condition resulted in increased dependence on family members for activities of daily living, social embarrassment due to frequent coughing episodes, and withdrawal from previously enjoyed activities, leading to a perceived decline in her overall quality of life. Owing to perceived lack of benifit and increasing side effects along with the building up of frustration with her condition, the patient voluntarily discontinued all pharmacological therapy. This resulted in persistence of symptoms and progressive worsening. In 2022, five years after discontinuing pharmacological therapy, the patient was referred for physiotherapy to undergo pulmonary rehabilitation following a recommendation from a family acquaintance who was aware of its potential benefit. Notably, despite a 20-year history of non-cystic fibrosis bronchiectasis and recurrent exacerbations, the patient had never been referred for pulmonary rehabilitation before her presentation in 2022, representing a missed opportunity for comprehensive multidisciplinary management. Evidence from the Indian EMBARC registry indicates that pulmonary rehabilitation remains underutilized, with only 38.1% (355/932) of eligible patients being referred despite established recommendations.[9,10]

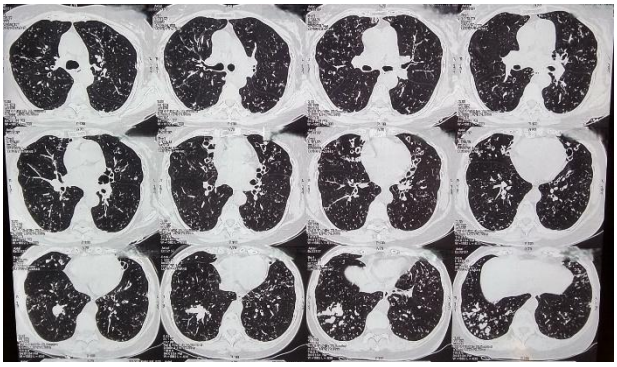

Figure 2: HRCT chest.

Various investigations, including Chest X-ray figure 1, HRCT figure 2, were done during her course of diagnosis, and various medicines were prescribed over the course of 20 years.

She had multiple hospital/OPD consultations over a period of 5 years. She was allergic to various foods, including eggs. Her stress test performed in 2016 suggested that the patient was able to complete 7 METS, reached 89% of the age-predicted maximal heart rate (HR max), and was found to be negative for inducible ischemia. Physiotherapy assessment was documented (Table 2), and based on this, a rehabilitation plan was individualised to best fit her capacity and needs. Pulmonary rehabilitation included the following exercises, counselling sessions and diet modifications (Table 3).

Despite regular patient education sessions, the patient declined all forms of pharmacological therapy, including nebulization, hence, the rehabilitation program was

individualized with an emphasis on patient safety, close monitoring, and minimizing the risk of exacerbations. Patient education, correctly performing bronchial hygiene techniques, improving lung function and capacities within the limits imposed by the condition, improving peripheral muscle strength and endurance, and improving aerobic capacity were designed to improve her overall quality of life. The treatment protocol was carried out over a period of 4-6 months with three sessions/week and a home program, the patient being a yoga practitioner; certain Yog asanas were also included. The patient tolerated all the components of the protocol without any adverse events when under supervision or at home while performing exercises.

Table 1: Latest investigations and medical management.

Tests done	Year of investigation	Results
IgE (serum immunoglobulin)	2015	15320 IU/ml
PFT (pulmonary function test)	2017	Moderate obstruction in large airways with poor BD reversibility FVC 67%, FEV1 45%, FEV1/FVC 74
List of medicines prescribed	In no specific order	Candiforce inhaler, combimist, singulair, sodyme, rynayma, pulmocare, various steroids, montek-AB, montek-LC, eragold, doxolin, livogen, naprosyn, formosone, glycomet (I/V/O increased sugars), wysolone, voglibose, lukotas, aerodil, deriphyllin, formosone, medrol, few ayurvedic medicines.
Chest radiography	2016 (figure 1)	Multiple ground glass opacities, honeycombing seen, hyperinflated lung fields bilaterally seen, fibrotic strands seen in bilateral middle and lower zones.
	2017 During exacerbation	Markedly increased bronchovascular markings seen in the bilateral hilar region, fibrotic nodules and strands seen over the bilateral lung fields.
HRCT chest	2021 (figure 2)	Discrete and confluent centrilobular nodules in bilateral lung parenchyma, showing a tree in bud. Mucoceles with high attenuation mucous content in the right lower lobe. Bronchiectasis changes in the bilateral lung parenchyma with diffuse bronchiolar thickening. Cystic bronchiectasis changes in the right middle lobe, lingula segment, with a few air-fluid levels, superadded infection/bronchiolitis.
Body weight (kgs)	2012	74 kgs (desired weight: 50-60 kgs)
	2023	41 kgs

Table 2: Physiotherapy assessment findings.

	Impairments	Day 1 of PR	4 months into PR	One year follow-up
1	Cough with expectoration	P3 (Miller's and Jones grade), 5 tablespoons per bout, 8-10 times a day	P2, 2 tablespoons per bout, 5-8 times a day.	M2, 1-2 tablespoons per day
2	Haemoptysis	Occasionally, frank	Occasional	None for the past 1 year
3	Fatigue (NRS scale 1-10)	7	5	2
4	Breathlessness MMRC	3-4	3	2
5	Seasonal variation	Yes	Yes	Yes
6	Postural cough stimulus	Yes, with significant expectoration	Reduced with mild expectoration	Occasional without expectoration
7	Weight	36 kg	38 kg	41 kg
8	Auscultation	Severely reduced air entry all over the lung field in all zones, with bilateral coarse	Moderately reduced air entry over the bilateral lower zones, with	Air entry is better, reduced mildly over the bilateral lower zones, occasional crepitations over RT lower zone.

Continued.

	Impairments	Day 1 of PR	4 months into PR	One year follow-up
		crepitations in the middle zone and lower zones RT>LT.	crepitus over the bilateral lower zones.	
9	LCQ (Leicester cough questionnaire) Higher scores imply better QOL	Total 9.9 Physical 3.37 Social 4.28 Psychological 2.25	Total 15.95 Physical 5.25 Social 5.42 Psychological 5.25	Total 24.87 Physical 5.87 Social 6.5 Psychological 6
10	1 min sit to stand	17/min, Post SPO_2-92%, RPE 5, RR 42 breaths/min	30/min, Post SPO_2-92%, RPE 4, RR 38 breaths/min	36/min, Post SPO_2-92%, RPE 3, RR 36 breaths/min
11	SPO_2 (oxygen saturation)	Baseline 96% Walking 10 meters 89-91%	Baseline 96% Walking 10 meters 93%	Baseline 96% Walking 10 meters 93%
12	SBC (single breath count)	6	14	24

Table 3: Physiotherapy PR protocol.

First month of PR	Day 1 of PR	4 months into PR	One year follow-up
Modified postural drainage positions for bilateral middle and lower lobes, all segments and the apical segment of the upper lobe.	Same treatment as before	Same treatment as before	Same treatment as before
ACBT 3-5 cycles combined with PD positions	Sit-to-stand exercises started OD	Walking progressed to 30 mtsx10 rounds once a day (SPO_2 89-92%)	Walking progressed to 30 mtsx10 rounds twice a day
Pursed lip breathing exercises 2 sets of 5-8 reps Thrice a day	Lower limb strengthening with red theraband 3d/wk	Cycling static cycle 10 mins (SPO_2 93-94%)	Cycling on a static cycle 3 times a week, 10 mins
Balloon bladder training 2 sets of 5-8 reps Twice a day	Balloon bladder training 2 sets of 5-8 reps TD	Wall push-ups 10 repsx2 sets	Chair sit to stand for 1 minute
Incentive spirometer 300CCx10 reps with controlled breathing techniques	Incentive spirometer 600CCx10 reps with controlled breathing techniques BD	Staircase climbing 1 flight with breaks after every 5 steps, incorporated with pursed lip breathing technique. (SPO_2 85-90%) (PR 120-125 bpm) recovery in 3 mins with rest.	Staircase climbing 2 flights of stairs incorporated with pursed lip breathing technique. (SPO_2 85-90%) (PR 120-125 bpm) recovery in 3 mins with rest.
Upper limb strengthening exercises with a 500 ml bottle, major muscle groups 1 setx10 reps	Progression of upper limb strengthening with 1l bottle, major muscle groups 1 setx10 reps 3d/wk		Upper limb strengthening with blue theraband major muscle groups 1 setx10 reps 3d/wk
Walking in the house, 3 rounds progressed to 5, 8 and 10 rounds each week (maintaining SPO_2 90-92% with adequate rest pause in between)	Walking in the garden 30 mtsx3 rounds progressed to 5 rounds (SPO_2 89-92%) once a day		Lower limb strengthening with green theraband major muscle groups 1 setx10 reps 3d/wk
Ergonomic advice with energy conservation techniques and modification of sleeping position (to keep the head end slightly elevated with a pillow)	Cycling on a stationary cycle with no resistance for 3 mins, 4 mins, 5 mins and 7 mins (progression each week) Twice a week (maintaining SPO_2 92-94%)		

Continued.

First month of PR	Day 1 of PR	4 months into PR	One year follow-up
Yogasana- Marichyasana Gomukhasana Paschimotanasana	Yogasana- 1 Surya namaskar /day Sarvangasana Malasana	Yogasana- tolasana 2 Surya namaskar/day	Aerobic dance exercises for 10 mins (5 minsx 2sets) with general body movements twice a week

DISCUSSION

As seen in table 2, there was a significant improvement in the patient's symptoms and quality of life. The LCQ scores increased from 9.9 to 24.8 (MCID 1.5-2 points).[11] Lower limb functional strength in terms of one-minute sit-to-stand improved by double. The single breath counts also increased from just 6 to 24. There was a reduction in the coughing bouts as well as the number of exacerbations, with improved sleep quality. Other noticeable improvements were clarity of voice, continuity of talking and vocation, reduced frequency of haemoptysis and weight gain from severely underweight (38kgs) to borderline underweight (45 kgs) category. Reduction in the frequency of exacerbations and improvement in the overall functioning of the patients in doing daily activities and household chores were reported by the patient. The patient continued the exercises under our guidance with regular updates and phone consultations over the following year.

Physiotherapy in the form of airway clearance techniques like ACBT (Active cycle of breathing technique) and postural drainage, chest physiotherapy techniques of percussion and vibrations have been proven to be effective in adults with non-cystic fibrosis bronchiectasis.[12-16] Pulmonary rehabilitation in the form of aerobic exercises, breathing exercises and strengthening of upper limbs and lower limbs is effective in improving the quality of life of these individuals.

Loss of strength in the peripheral muscle is evident in patients with chronic respiratory diseases due to various factors like malnutrition, electrolyte disturbance, physical inactivity, systemic inflammation, oxidative stress and long-term oral corticosteroid use, to name a few, resulting in wasting of peripheral skeletal and respiratory muscles with deconditioning.[17] Peripheral muscles strengthening improves Oxygen consumption and is effective in improving function in individuals with chronic respiratory diseases.[18-20] Within two to three weeks of starting pulmonary rehabilitation, the patient experienced a mild reduction in her symptoms, a sense of confidence and independence, like when she went to the market on her own, even if it was just to buy bananas for her daughter, about 500 mts away from the house for the first time in a span of 1 year.

She started doing activities like yoga, going out for walks, socialising, going on trips with the family and even climbing a tree on her own, which gave her and the family members a sense of fulfilment and hope to take control of the disease and not let it demean her. The purpose of documenting this case study was to emphasise that pulmonary rehabilitation is effective in improving the quality of life and improving function in adults with non-cystic fibrosis bronchiectasis, even after discontinuing medications in this case. Timely referral of bronchiectasis patients to a physiotherapist for pulmonary rehabilitation is essential to delay exacerbation and counteract systemic inflammation.

CONCLUSION

Individualised PR, when applied with proper assessment, gives the best outcome. Consistency is the key to sustained results in patients with chronic respiratory conditions. Pulmonary rehabilitation, even without medication, was extremely effective in improving quality of life in a geriatric patient with non-cystic fibrosis bronchiectasis, and this improvement was persistent after a one-year follow-up. Inclusion of medical management was gradually emphasised and introduced, and the patient was put on maintenance therapy. This case highlights the potential benefits of individualized pulmonary rehabilitation in patients with chronic respiratory disease, demonstrating improvements in functional capacity, symptom management, psychosocial health, and health-related quality of life, even in the context of longstanding disease.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Polverino E, Goeminne PC, McDonnell MJ, Aliberti S, Marshall SE, Loebinger MR, et al. European Respiratory Society guidelines for the management of adult bronchiectasis. Eur Respir J. 2017;50(3):1700629.
2. Dhar R, Singh S, Talwar D, Mohan M, Tripathi SK, Swarnakar R, et al. Bronchiectasis in India: results from the European Multicentre Bronchiectasis Audit and Research Collaboration (EMBARC) and Respiratory Research Network of India Registry. Lancet Glob Health. 2019;7(9):e1269-79.
3. Chalmers JD, Crichton ML, Brady G, Azzari C, Orihuela CJ, Elborn JS, et al. Pulmonary rehabilitation after exacerbation of bronchiectasis: a pilot randomized controlled trial. BMC Pulm Med. 2019;19:85.
4. Lee AL, Hill CJ, Cecins N, Holland AE, Jenkins SC, McDonald CF, et al. The short- and long-term effects of exercise training in non-cystic fibrosis bronchiectasis – a randomised controlled trial. Respir Res. 2014;15:4.

5. Abo-Leyah H, Chalmers JD. New therapies for the prevention and treatment of exacerbations of bronchiectasis. Current Opinion in Pulmonary Medicine. Lippincott Williams and Wilkins; 2017:218-24.
6. Hill AT, Sullivan AL, Chalmers JD, De Soyza A, Elborn JS, Floto RA, et al. British Thoracic Society guideline for bronchiectasis in adults. BMJ Open Respir Res. 2018;5:e000348.
7. Pasteur MC, Bilton D, Hill AT. British Thoracic Society guideline for non-CF bronchiectasis. Thorax. 2010;65(1):i1-58.
8. Dhar R, Singh S, Talwar D, Murali Mohan BV, Tripathi SK, Swarnakar R, et al. Clinical outcomes of bronchiectasis in India: data from the EMBARC/Respiratory Research Network of India registry. Eur Respir J. 2023;61(1):2200611.
9. Dhar R, Singh S, Talwar D, Murali Mohan BV, Tripathi SK, Swarnakar R, et al. Bronchiectasis in India: results from the EMBARC and Respiratory Research Network of India registry. Natl Med J India. 2020;33(2):99-101.
10. Birring SS, Muccino DR, Bacci ED, Vernon MK, Nguyen AM. Defining minimal clinically important differences (MCID) on the Leicester Cough Questionnaire (LCQ): analyses of a phase 2 randomized controlled trial in chronic cough. J Allergy Clin Immunol. 2019;143(2):AB52.
11. Mandal P, Sidhu MK, Kope L, Pollock W, Stevenson LM, Pentland JL, et al. A pilot study of pulmonary rehabilitation and chest physiotherapy versus chest physiotherapy alone in bronchiectasis. Respir Med. 2012;106(12):1647-54.
12. Herrero-Cortina B, Lee AL, Oliveira A, O'Neill B, Jácome C, Dal Corso S, et al. European Respiratory Society statement on airway clearance techniques in adults with bronchiectasis. Eur Respir J. 2023;62:2202053.
13. Muñoz G, De Gracia J, Buxó M, Alvarez A, Vendrell M. Long-term benefits of airway clearance in bronchiectasis: a randomised placebo-controlled trial. Eur Respir J. 2018;51:1701926.
14. Zisi D, Chryssanthopoulos C, Nanas S, Philippou A. The effectiveness of the active cycle of breathing technique in patients with chronic respiratory diseases: a systematic review. Heart Lung. 2022;53:89-98.
15. Phillips J, Lee AL, Pope R, Hing W. Physiotherapists' use of airway clearance techniques during an acute exacerbation of bronchiectasis: a survey study. Arch Physiother. 2021;11:3.
16. De Camargo AA, Boldorini JC, Holland AE, De Castro RAS, Lanza FDC, Athanazio RA, et al. Determinants of peripheral muscle strength and activity in daily life in people with bronchiectasis. Phys Ther. 2018;98(3):153-61.
17. Pehlivan E, Niksarlıoğlu EY, Balcı A, Kılıç L. The effect of pulmonary rehabilitation on the physical activity level and general clinical status of patients with bronchiectasis. Turk Thorac J. 2019;20(1):30-5.
18. Lee AL, Hill CJ, McDonald CF, Holland AE. Pulmonary rehabilitation in individuals with non–cystic fibrosis bronchiectasis: a systematic review. Arch Phys Med Rehabil. 2017;98(4):774-82.
19. Ni R, Cai L, Xing Y, Fan X. The Effects of Respiratory Training Combined with Limb Exercise on Pulmonary Function and Quality of Life in Patients with Bronchiectasis. J Multidiscip Healthc. 2023;16:475-82.
20. Burtin C, Hebestreit H. Rehabilitation in patients with chronic respiratory disease other than chronic obstructive pulmonary disease: exercise and physical activity interventions in cystic fibrosis and non-cystic fibrosis bronchiectasis. Respiration. 2015;89(3):181-9.

Cite this article as: Pol TT, Shetye JV. Beyond Medication: Pulmonary rehabilitation in an older adult with non-cystic fibrosis bronchiectasis and allergic bronchopulmonary aspergillosis – a case report. Int J Res Med Sci 2026;14:3111-7.