MAR Pulmonology & Respiratory Medicine (2026) 9:1

Case Report

Combined Management of an Aspergillus Pleural Empyema in a 47-Year-Old woman

Hiba El Hajjouli *[1], Wafae Elaamadi [1], Mohamed Bouchikh [1], Rachid Taoufiq [1], Ittimade Nasser [2], Kaoutar Imrani [2], Ahmed Jahid [3], Abdellah Achir [1]

1. *Department of Thoracic Surgery CHU IBN Sina, Rabat, Morocco.*
2. *Department of Radiology, Ibn Sina University Hospital, Rabat, Morocco.*
3. *Department of Anatomopathology, Ibn Sina University Hospital, Rabat, Morocco.*

Correspondence to: Dr. EL HAJJOULI HIBA, Department of Thoracic Surgery, Ibn Sina University Hospital, Rabat, Morocco.

Copyright

Received: 12 January 2026

Published: 01 February 2026

Abstract

Fungal empyema is uncommon disease and rarely caused by aspergillus species. Aspergillus pleural empyma is associated with high mortality and morbidity rates.

The optimal approach to managing aspergillus-infected pleura is surgical removal combined with the early administration of anti-fungal agents.

We report a case of surgical management of Aspergillus pleural empyema in a previously healthy 46-year-old woman who has presented with a short history of fever, nonproductive cough, a progressive breathlessness and a right-sided chest pain evolving for 9 months.

A frontal chest radiograph showed a massive right pleural homogenous opacity with pleural thickening. Contrast enhanced computed tomography (CT) scan of chest showed a voluminous right pleural mass with calcified wall measuring 221x110x157mm.

The patient underwent initially a surgical decortication, and the postoperative period was uneventful. However, three weeks after the first admission, she was rehospitalized for persistent fever, productive cough, and a chest wall infection. Her CT showed right pleural empyema.

A Chest tube drainage was performed and intravenous therapy with voriconazol was administrated. Later on, the patient condition remained stable and showed a good recovery.

In conclusion, diagnosing and treating Aspergillus pleural empyema poses a lot of challenges, particularly in cases where delayed recognition requires urgent surgical intervention.

Keywords: *Aspergillus, Antifungal Drugs, Pleural Empyema.*

Introduction

Pleural aspergillosis was described for the first by Cleland in 1847, where 29 cases were reported [1]. It is a rare clinical entity, but remains a life-threatening infection. Aspergillus fumigatus is known to be the most commonly isolated species, followed by the Aspergillus flavus and Aspergillus niger [2][3]. Aspergillus pleural empyema is usually associated with pulmonary infection, preexisting chronic empyema, or as a complication of surgical procedure [4].

The clinical manifestation and the severity of this disease rely on the patient's immunologic state [5].

A comprehensive approach involving multidisciplinary care is necessary for both diagnosis and treatment of aspergillus-infected pleura, encompassing the selection of appropriate anti-fungal drugs, early drainage, and surgical intervention.

Here, we report a case of Aspergillus pleural empyema in a previously healthy woman which was managed by combined surgical and anti-fungal treatment.

Case Report

A 46-year-old female consulted within our department for a short history of fever, nonproductive cough, a progressive breathlessness and a right-sided chest pain evolving for 9 months. Her past medical history was remarkable for lung hydatid cysts, for which the patient has had thoracic surgery on both sides in 2001. One year later, in 2002, she underwent an abdominal surgery to treat a liver hydatid cyst.

On physical examination, the patient was conscious and eupneic, with a right and left posterolateral thoracotomy scars, and a right subcostal laparotomy scar. The chest auscultation revealed a liquid pleural effusion syndrome on the right hemithorax. Rest of the physical examination was unremarkable.

The initial laboratory evaluation revealed a white cell count of 6900/µl and a CRP of 11mg/l, also the biochemical profile was normal and the blood cultures were eventually negative. Her chest radiograph [Figure 1] showed a massive right pleural homogenous opacity with pleural thickening. Contrast enhanced computed tomography (CT) scan of chest showed a voluminous right pleural mass occupying almost the entire right hemithorax, oblong, well-limited, hypodense, with calcified wall, weakly enhanced after contrast medium measuring 221x110x157mm and pushing back the right pulmonary parenchyma [Figure 2].

Figure 1: Chest X-ray on admission shows a massive right pleural homogenous opacity with pleural thickening and obliteration of right costo-phrenic angle.

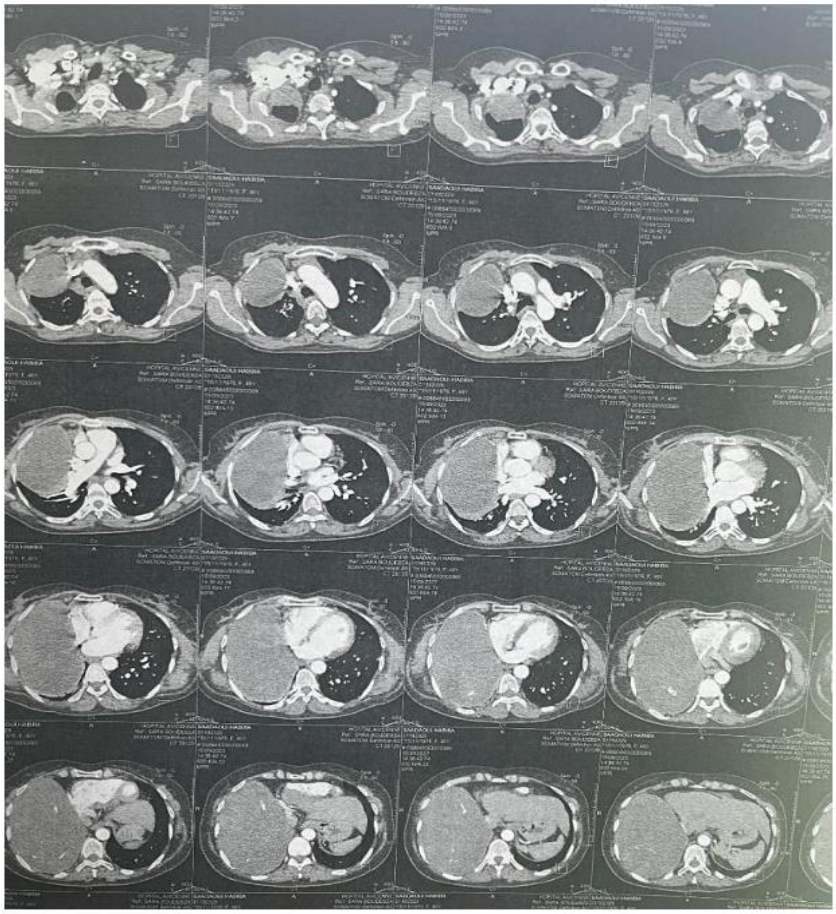

Figure 2: Chest CT reveals a voluminous right pleural mass

There was no mediastinal lymphadenopathy or lung parenchymal involvement. Initially a presumptive diagnosis of solitary fibrosis tumor was made. The patient underwent a right submammary thoracotomy via the 5th intercostal space. The intraoperative findings revealed an important pleural thickening containing an extensive empyema with thick lumps, otherwise the lung was shriveled. A complete parietal pleurectomy was done along with pulmonary decortication. Pleural fluid and parietal pleura samples were collected for cultures and pathological examination. The postoperative recovery was straightforward, and the patient was discharged on the 10th postoperative day.

Three weeks after her first admission, she was readmitted for persistent fever, productive cough, and suppuration of the surrounding soft tissues and skin of the chest wall (facing the right submammary thoracotomy). Her CT [Figure 3] revealed a large right pleural effusion with an hydroaeric level and a soft tissue collection witnessing an empyema necessitans. An intercostal tube drainage was performed, bringing 1600ml of frank pus [Figure 4]. The result of peroperatif pleural fluid culture showed septate fungal hyphae. After the identification of Aspergillus Flavus, intravenous voriconazole was immediately initiated. We started with an initial dose of 12mg/kg for 24H then 6mg/kg/day for the next two weeks. The intravenous voriconazole administration was followed by an oral intake fluconazole (100mg per day) for three months. Clinical evaluation, laboratory tests, and chest x-rays have ensured treatment monitoring. Otherwise, no undesirable effect was detected. The patient showed good clinical and radiological recovery.

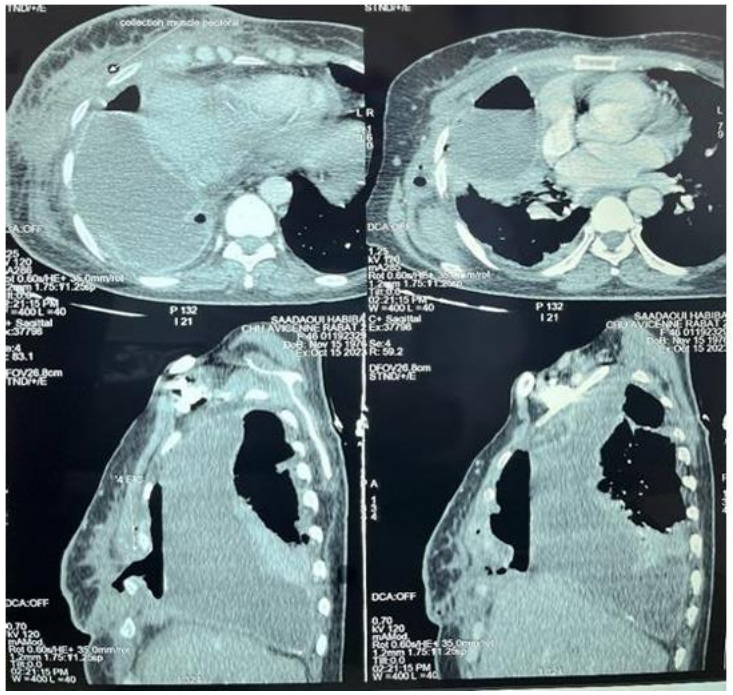

Figure 3: Chest CT showing large right pleural effusion with an empyema necessitans.

Figure 4: Pleural fluid aspect (frank pus)

Discussion

Aspergillosis is mainly an air-borne disease, and pulmonary aspergillosis is the most common source of Aspergillus pleural empyema, espcially when it is secondary to the rupture of an aspergilloma cavity. Several cases of fungal empyema involve predisposing factors such as compromised immunity, broad-spectrum antibiotics, malignancies, or previous surgery [6].

Aspergillus pleural empyema following several years after a thoracic surgery is exceedingly rare. Limited data have been made available on it, therefore, its incidence remains unknown [7]. In our case, we hypothesize that the infection of the pleura occurred during the 20 years after her first surgery.

Pleural aspergillosis account < 1% of all pleural effusions [6]. The presence of necrotic exudate and an aerobic environment create conditions in which the organism may thrive [3].

Diagnosing Aspergillus infection has long been challenging, primarily due to the difficulty of isolating it in blood culture or to the difficulty of obtaining a tissue biopsy [5].

However, its diagnostic outcome may be increased by combining culture, microscopy and PCR. Although, Aspergillus PCR offers a practical option for early detection and potentially serves as a means to monitor

therapy [4][7]. In our patient, the definite diagnosis for aspergillus infection as empyema thoracis was only achieved by the culture and histopathology of the surgical tissue biopsy.

A variety of treatment recommendations have been suggested combining surgical and medical approach which proved beneficial for the patiens [1][2].

The previously reported outcome of Aspergillus pleural empyema may not be as detrimental as described because of the surgical development and the use of new anti-fungal agents [8].

Various surgical techniques have been employed to enhance functional respiratory outcomes including thoracotomy and decortication of the affected side [4][9], surgical debridement of only the bronchial stump following lobectomy/pneumonectomy [7] the removal of infected chest wall implants, and thoracoplasty [10].

Regarding anti-fungal therapy, Amphotericin-B (AMB) has been the primary medical approach, yet the significant drawback was the toxicity linked to its administration in nearly 80% of patients [11][12][13]. Voriconazole is also a broad spectrum triazole and it is better tolerated than AMB. Its IV administration is widely recommended in seriously ills patients, at a rate of 9mg/kg for the first 24 hours, then 8mg/kg for patients whom the weight is equal or higher to 50kg [2].

In our case, we administered IV voriconazole for 2 weeks (12mg/kg for 24H then 6mg/kg/day) followed by an additional 12 weeks of oral fluconazole (100mg per day). A close clinical and laboratory monitoring were made, based on respiratory function indices, liver function tests, serum inflammatory markers, and serial chest X-rays.

Burgos et al. found out that the only predictor of survival was surgical resection of focal disease, and emphasize the impact of patient immune status for better outcomes [14]. In our case, surgical approach aimed at both diagnosis and therapy, also anti-fungal treatment proved beneficial for the patient. Thus their combination provided an effective cure.

Conclusion

To summarise, diagnosing and treating Aspergillus pleural empyema can be challenging, but remains one of the diagnoses to be considered when clinical signs are associated with environmental and socioeconomic factors specially residential area with heavy loads of Aspergillus spores. Combining surgical and antifungal therapy remains the gold standard of its management.

Competing Interests

The authors declare no competing interests with this case.

Authors' Contributions

The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors. Indeed, all the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

References

1. Hyun C, Joon C, Chul MA, Sung K, Won YL, Doo YL. Pleural aspergillosis. February 1988 ; Yonsei Medical Journal 29(1):84-8.
2. Kanakis MA, Th Petsios, NM Giannopoulos, Bobos D, Hatzianastasiou, Sianidou LC and Lioulias A. Surgical management of an aspergillus empyema in a 3-year-old child. Hindawi; Volume 2020, Article ID 5179292.
3. Kanakis MA, Th Petsios, NM Giannopoulos, Bobos D, Hatzianastasiou, Sianidou LC and Lioulias A. Surgical management of an aspergillus empyema in a 3-year-old child. Hindawi; Volume 2020, Article ID 5179292.
4. Meredith HC, Cogan BM, McLaulin B. Pleural aspergillosis. AJR Am J Roentgenol 1978; 130;164-166.
5. M. Herring and D. Pecora. Pleural aspergillosis: a case report, the American Surgeon, vol. 42, no. 42, pp. 300-302, 1976.
6. Jenks JD, Hoenigl M. Treatment of aspergillosis. J Fungi. 2018;4(3):98.
7. Benjanuwattra J, Leelaviwat N, Guerin C, Patel P, Mekraksakit P , Nugent K. Empyema necessitans as a rare manifestation of Aspergillus fumigatus infection. Proc (Bayl Univ Med Cent); 2021 Dec 16;35(2):193- 194.
8. H. Bonatti et al. Successful management of postpneumonectomy Aspergillus pleural empyema by combined surgical and anti-fungal treatment with voriconazole and caspofungin. Blackwell Verlag GmbH 2009; 53: 448-454.

9. Schiza S, Siafakas NM. Clinical presentation and management of empyema, lung abscess and pleural effusion. Curr Opin Pulm Med 2006; 12: 205-11.
10. M. C. Kearon, J. T. Power, A. E. Wood, and L. J. Clancy. Pleural aspergillosis in a 14 year old boy, Thorax, vol 42, no. 6, pp. 477-478, 1987.
11. Y. Imura, T. Ohtsuka, T Kobayashi, and H. Yammamoto. A case report of pulmonary aspergillosis complicated with perforated empyema-indication of thoracoplasty, cavernoplasty and extraperisoteal detachment. Kekkaku, 1990 ; 723-727.
12. Bhatnagar T, Bhatnagar AK. Pleural Aspergillosis in an otherwise healthy individual. Lung India. 2014;31:155-7.
13. Herbrecht R, Denning DW, Patterson TF, Bennett JE, Greene RE, Oestmann JW, et al. Voriconazole versus amphotericin B for primary therapy of invasive Aspergillosis. N Engl J Med 2002;347:408-15.
14. Goel MK, Juneja D, Jain SK, Chaudhuri S, Kumar A. A rare presentation of aspergillus infection as empyema thoracis. Lung India; 2010 Jan;27(1):27-9.
15. A. Burgos, T. E Zaoutis, C. C. Dvorak et al. Pediatric invasive aspergillosis : a multicenter retrospective analysis of 139 comtemporary cases. e1286-e1294, 2008.
16. M. C. Kearon, J. T. Power, A. E. Wood, and L. J. Clancy. Pleural aspergillosis in a 14 year old boy, Thorax, vol 42, no. 6, pp. 477-478, 1987.
17. Y. Imura, T. Ohtsuka, T Kobayashi, and H. Yammamoto. A case report of pulmonary aspergillosis complicated with perforated empyema-indication of thoracoplasty, cavernoplasty and extraperisoteal detachment. Kekkaku, 1990 ; 723-727.
18. Bhatnagar T, Bhatnagar AK. Pleural Aspergillosis in an otherwise healthy individual. Lung India. 2014;31:155-7.
19. Herbrecht R, Denning DW, Patterson TF, Bennett JE, Greene RE, Oestmann JW, et al. Voriconazole versus amphotericin B for primary therapy of invasive Aspergillosis. N Engl J Med 2002;347:408-15.
20. Goel MK, Juneja D, Jain SK, Chaudhuri S, Kumar A. A rare presentation of aspergillus infection as empyema thoracis. Lung India; 2010 Jan;27(1):27-9.
21. A. Burgos, T. E Zaoutis, C. C. Dvorak et al. Pediatric invasive aspergillosis : a multicenter retrospective analysis of 139 comtemporary cases. e1286-e1294, 2008.