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(CASE REPORT)

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Hydropneumothorax masking a dual pathological challenge: Ruptured pulmonary hydatid cyst co-existing with active tuberculosis

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Abstract

Introduction: The co-infection of pulmonary hydatid cyst (PHC) and tuberculosis (TB) represents a major diagnostic challenge in endemic regions. This association can be complex to identify when acute signs of a complication mask an underlying chronic process.

Case report: We report the case of a 16-year-old patient admitted for the assessment of an acute hydropneumothorax, occurring after a two-month history of chronic cough, night sweats, and constitutional symptoms. While initial pleural investigations—including biopsy and pleural fluid GeneXpert—showed no evidence of a bacillary process at the serosal level, the systematic search for scolex in the pleural fluid and the results of bronchial aspirates allowed for the final diagnosis to be established. The identification of scolex in the pleural fluid confirmed the cyst rupture, while systematic bronchial aspirates revealed positive GeneXpert and Koch's bacillus (BK) results, confirming a concurrent active pulmonary tuberculosis, despite negative bronchial scolex results.

Conclusion: This case highlights the crucial importance of direct scolex identification and systematic bronchoscopy with aspirates to unmask an occult parenchymal pathology during an acute pleural complication, especially when serological and pleural biopsy results are non-contributory.

Keywords: Hydropneumothorax; Hydatid cyst; Pulmonary tuberculosis; Bronchoscopy; GeneXpert; Scolex

1. Introduction

Hydatidosis and pulmonary tuberculosis (TB) remain two major public health concerns in Morocco. The co-infection of pulmonary hydatid cyst (PHC) and TB represents a major diagnostic challenge in endemic regions, where both diseases share similar environmental and socioeconomic risk factors [1]. This association can be complex to identify when acute signs of a complication, such as a rupture, mask an underlying chronic process [2].Although the diagnosis ideally relies on the direct identification of the pathogen, these conditions are frequently confused due to non-specific radiological and clinical semiology [3]. The transition to an acute pleural complication stage can delay appropriate therapeutic care for the underlying chronic pathology [4].

2. Case Report

We report the case of a 16-year-old male patient, a farmer in a rural area, with no notable medical history. He presented with a two-month history of cough associated with night sweats, anorexia, and unquantified weight loss. The clinical

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picture worsened abruptly 24 hours before admission with the onset of intense right chest pain and Sadoul stage III dyspnea.

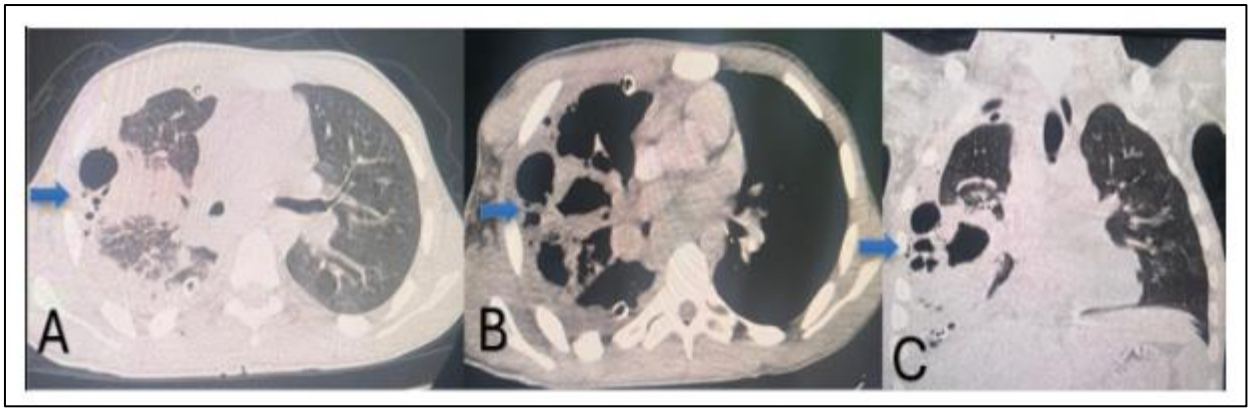
Clinical examination upon admission revealed a conscious patient, tachypneic at 24 breaths/min, with SaO2 at 93% on room air and a heart rate of 122 bpm. Pleuropulmonary auscultation revealed a mixed pleural effusion syndrome (hydro-aeric) occupying the lower two-thirds of the right hemithorax. A chest X-ray confirmed a large-abundance right hydropneumothorax (Figure 1). Computed tomography (CT) of the chest showed a voluminous scissural collection communicating with the pleural space, associated with bilateral alveolar involvement consisting of diffuse nodules and micronodules (Figure 2).

Initial laboratory tests showed a marked inflammatory syndrome with a CRP of 290 mg/l. Hydatid serology and sputum GeneXpert were negative. An exploratory pleural puncture returned a cloudy citrine yellow fluid. Pleural biopsy and GeneXpert on the pleural fluid were negative, showing no evidence of tuberculosis at the level of the pleural serosa.

The diagnosis of the first pathology was established by the examination of the pleural drainage fluid, which revealed the presence of scolex, confirming the hydatid rupture (Figure 3). Simultaneously, a flexible bronchoscopy was performed, showing diffuse inflammatory mucosa. While bronchial aspirations were negative for scolex, they returned positive for GeneXpert and the search for Koch's bacillus (BK) on direct microscopic examination was positive (Figure 4), confirming the associated active pulmonary tuberculosis

Initial management consisted of emergency pleural drainage, which provided symptomatic relief and allowed for the initial diagnostic samples. Following the confirmation of the dual pathology, the patient was started on a standard four-drug antitubercular regimen (Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol). Due to the presence of a ruptured cyst and significant pleural symphysis, thoracic surgery was performed via a right posterolateral thoracotomy through the fifth intercostal space. Intraoperatively, dense pleural adhesions required a laborious extrapleural liberation of the right lung. A cystic mass with a thick, hard wall was identified in the lower lobe; puncture and aspiration of the cyst yielded purulent fluid, and the proligery membrane was successfully extracted. The procedure was completed with the closure of bronchial fistulas, capitonnage of the residual cavity, and a complete pleural decortication to allow lung re-expansion. Post-operatively, two thoracic drains were placed, and the patient continued the antitubercular therapy combined with Albendazole to prevent hydatid recurrence.

Figure 1 Chest X-ray (P-A view) showing a large-abundance right hydropneumothorax with a sharp horizontal air-fluid level and contralateral patchy opacities



(A, B) Axial views: Demonstration of bilateral alveolar involvement consisting of diffuse nodules and micronodules.(C) Coronal view: Visualization of a voluminous scissural collection communicating with the pleural space

Figure 2 Post-drainage chest CT findings

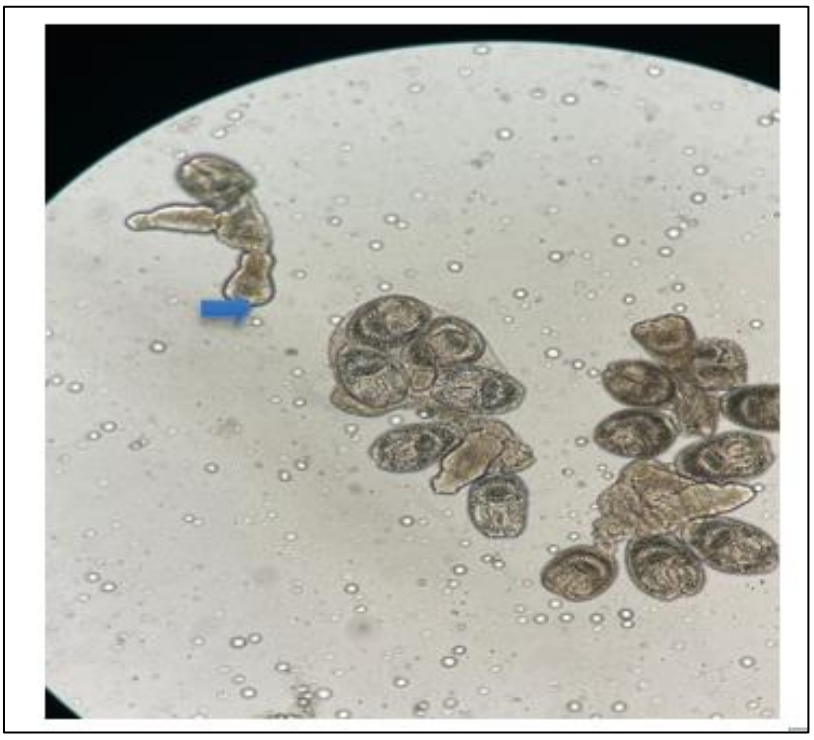


Figure 3 Pleural fluid protoscolices

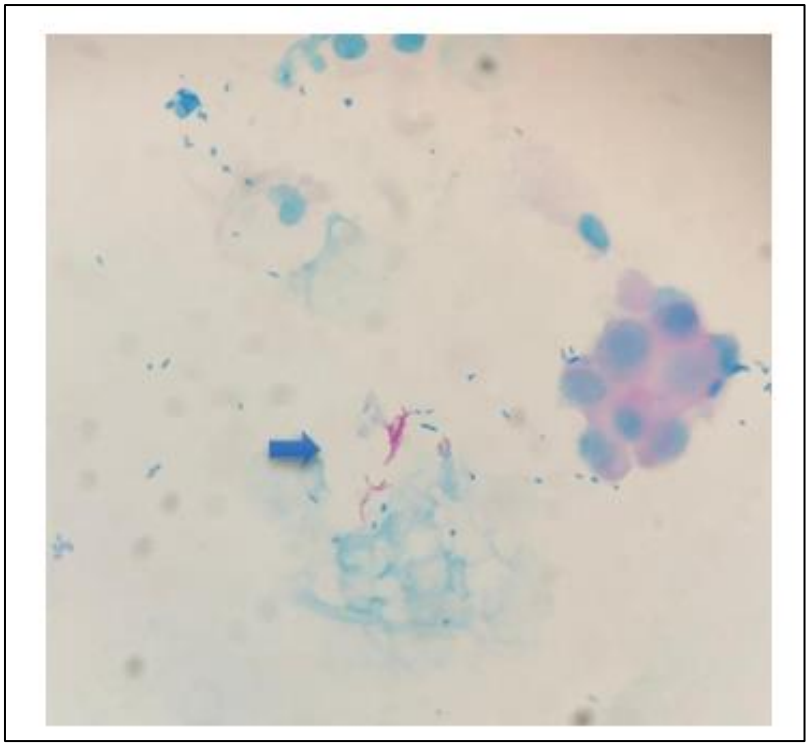


Figure 4 Direct microscopic examination of bronchial aspirate showing Koch's bacillus (BK)

3. Discussion

The coexistence of PHC and TB is a serious diagnostic conundrum in endemic countries, as both diseases share similar environmental and socioeconomic risk factors [1]. In our case, the acute hydropneumothorax served as the presenting feature of a dual infection that had been evolving chronically for two months [2].

The negativity of hydatid serology observed in this patient is a well-documented pitfall in pulmonary hydatidosis [3]. Unlike hepatic cysts, pulmonary cysts often yield lower antibody titers. Furthermore, during an acute rupture into the pleural cavity, a sudden release of antigens may lead to the formation of immune complexes, temporarily depleting circulating antibodies and resulting in a false-negative serological test [3]. This reinforces the principle that direct identification of scolex remains the gold standard for diagnosing ruptured PHC.

Radiologically, the coexistence of these pathologies can be misleading. While the hydropneumothorax and scissural collection are classic signs of hydatid rupture, the diffuse bilateral nodules seen on the CT scan are highly suggestive of miliary or bronchogenic spread of tuberculosis [4]. The parenchymal inflammation and necrosis caused by Mycobacterium tuberculosis can erode the adventitia of a nearby hydatid cyst, facilitating its rupture into the pleura [4].

The failure of the pleural biopsy and pleural GeneXpert to confirm tuberculosis in our patient is explained by the fact that the infection was strictly parenchymal and not a primary tuberculous pleurisy [5]. In such cases, the pleural effusion is often a reactive or "para-pneumonic" type caused by the hydatid rupture rather than direct bacillary infiltration of the pleura [5]. Systematic bronchial aspiration during bronchoscopy was the pivotal procedure in this case. It has been demonstrated that bronchial aspirates have a significantly higher diagnostic yield for TB than sputum samples, especially in paucibacillary patients or those where the rupture of a cyst might dilute the sputum [6]. Our findings confirm that even when scolex are absent in the bronchi, bronchial aspirates are essential to unmask associated tuberculosis [6].

The management of this dual pathology requires a simultaneous medical and surgical approach [7]. Standard antitubercular therapy remains the cornerstone of medical treatment, but it must be supplemented with Albendazole to manage the hydatid component and prevent recurrence.

Surgery is mandatory for ruptured cysts complicated by hydropneumothorax. In our patient, the discovery of a thick-walled cystic mass with purulent contents and a dense pleural symphysis justified an aggressive surgical approach [8]. Pleural decortication is essential to free the lung from the fibrous rind, while bronchial fistula closure and cavity capitonnage minimize the risk of postoperative complications [8].

4. Conclusion

This case report serves as a reminder of the need to maintain a high clinical suspicion of co-infection in any acute hydropneumothorax occurring against a chronic background of declining general health. It demonstrates that the negativity of pleural investigations (biopsy and pleural GeneXpert) does not exclude active pulmonary tuberculosis. Systematic bronchoscopy with aspirates remains the most reliable tool to resolve this dual pathological challenge and ensure the initiation of appropriate combined therapy.

Compliance with ethical standards

Disclosure of conflict of interest

The author declares no conflict of interest

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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