

Unusual Form Of Tuberculosis In An Immunocompetent Individual: The Chest Wall Tuberculosis

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Abstract:

Tuberculosis (TB) represents a significant global public health concern. The extrapulmonary manifestations of TB can pose challenges in terms of accurate diagnosis. Thoracic cold abscess is a rare and unusual form of TB. Its radioclinical aspects are nonspecific, which makes the diagnosis challenging. In endemic areas, any painless progressive abscess should suggest a tuberculosis infection. Although the Xpert MTB/Rif test has significantly improved diagnostic accuracy, a positive culture from a fluid or tissue sample still remains the definitive gold standard for diagnosis. The management of tuberculous thoracic abscess is based on the combination of surgery and antituberculosis treatment, which appears to be the most appropriate strategy to reduce recurrences. We report a case of a cold thoracic abscess in a 77-year-old immunocompetent man.

Key Word: Tuberculosis; Thoracic cold abscess; Xpert MTB/Rif.

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I. Introduction:

A cold abscess is a purulent collection that forms insidiously and is characterized by the absence of inflammatory reaction. Tuberculous cold abscess of the chest wall represents 1.5% of extrapulmonary tuberculosis cases. This is a rare and unusual form of tuberculosis that can be confused with a pseudo-tumoral mass or wall infections caused by slow-growing microorganisms [1]. In endemic areas, the diagnosis is based on clinical and radiological criteria and then confirmed through bacteriology and/or histology data. The therapeutic management is based on anti-bacillary chemotherapy, often combined with a surgical procedure of excision or drainage. We report a case of tuberculous cold abscess of the chest wall in a 77-year-old immunocompetent patient.

II. Cases Report:

We report the case of B.A, a 77-year-old patient with no history of tuberculosis or recent exposure to tuberculosis, no history of thoracic trauma, a former chronic smoker at 20 packs per year who quit 30 years ago, hypertensive for 12 years under treatment. The patient has presented for the past 3 months with a painful swelling in the left lower anterior thoracic region, without associated respiratory or extrapulmonary symptoms, in a context of afebrile state and a quantified weight loss of 7 kg.

The physical examination revealed a patient in good general condition, afebrile, and eupneic at rest. There was a palpable mass on the left lower anterior thoracic wall, with a cystic appearance, tender, fixed in relation to both the superficial and deep planes, and without local inflammatory signs. The rest of the examination was unremarkable.

Biology tests revealed a leukocyte count of 6200/mm³, with lymphocytes at 1200/mm³, a hemoglobin level of 12.2 g/dl, and a C-reactive protein (CRP) level of 28 mg/l. Serological tests for hydatid cyst and HIV were negative. Acid-fast bacillus (AFB) testing of sputum was negative.

The chest X-ray showed the absence of evolving pulmonary parenchymal lesions (**Figure 1**). Thoracic ultrasound revealed a heterogeneous parietal collection in the left lower thoracic region, suggestive of a parietal abscess (**Figure 2**). Thoraco-abdomino-pelvic computed tomography confirmed the presence of an oval-shaped formation measuring 53.4 * 23.6 mm, with thin walls and liquid content, containing fine septations. This formation was in contact with the anterolateral and basal left thoracic wall, adjacent to the anterior arches of the 6th, 7th, and 8th left ribs, without evidence of bone lysis. This is indicative of a benign cystic lesion with no other suspicious or evolving lesions noted within the thoraco-abdomino-pelvic region (**Figure 3**).

After the failure of an ultrasound-guided percutaneous aspiration of the thoracic mass, a surgical excision with drainage of the collection was performed. Histopathological examination of the operative specimen revealed epithelioid granulomas and giant cells with caseous necrosis, suggestive of parietal tuberculosis. Bacteriological analysis of the deep pus showed the presence of Acid-fast Bacilli on direct examination and in culture. GeneXpert testing on the deep pus was positive, with no resistance to rifampicin detected.

The diagnosis of a tuberculous cold abscess of the thoracic wall was established. The patient had received an antituberculosis treatment, according to the national tuberculosis control program in Morocco, consisting of isoniazid, rifampicin, pyrazinamide, and ethambutol for two months, followed by isoniazid and rifampicin for 4 months. The patient's progress after 6 months of treatment showed notable clinical and radiological improvement, with no detectable recurrence.



Figure 1: The chest X-ray.

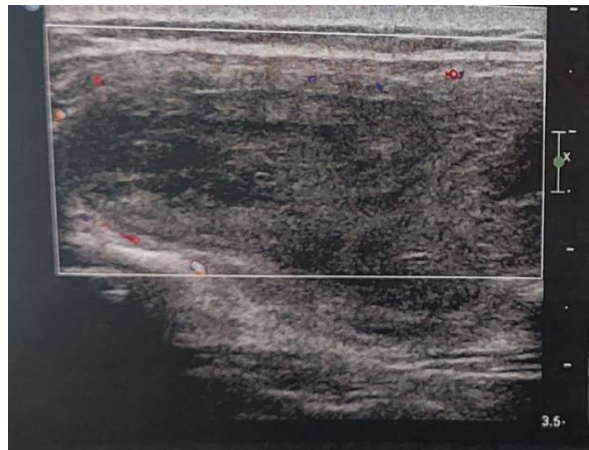


Figure 2: Thoracic ultrasound revealed a heterogeneous parietal collection.

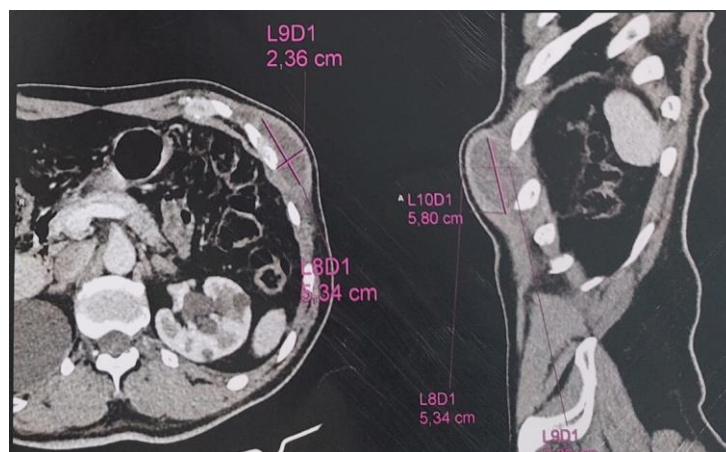


Figure 3: Thoraco-abdomino-pelvic computed tomography confirmed the presence of an oval-shaped formation measuring 53.4 * 23.6 mm, with thin walls and liquid content, in contact with the anterolateral and basal left thoracic wall.

III. Discussion:

Tuberculosis is a significant global public health issue. Ranked among the top 10 leading causes of mortality worldwide, it holds the second position in causes of death due to infectious diseases since 2020 (following COVID)[2]. The thoracic wall form is exceedingly rare, accounting for 1 to 5% of musculoskeletal localizations, which themselves comprise 1 to 2% of tuberculosis cases [3]. This particular manifestation has only been reported thus far in a few case series or as isolated case reports despite the controversy surrounding its pathogenesis, diagnostic management, and treatment.

In terms of pathogenesis, parietal involvement is often secondary to lymphatic drainage through an infected pleura or contiguous contamination resulting from the rupture of a tuberculous empyema into the soft tissues [4]. This localization can be secondary to hematogenous dissemination from a pulmonary focus or through direct transcutaneous inoculation, or extension from an adenitis of the thoracic wall [4, 5]. This latter mechanism is predominant for subcutaneous thoracic cold abscesses [6]. The anterior intercostal lymph nodes are more frequently affected, thus explaining the preferred parasternal localization of cold abscesses. Tuberculous abscesses often tend to fistulize to the skin [4, 5, 6], or rarely, to give rise to a secondary site. Parietal tuberculosis can be associated with other forms of tuberculosis (pulmonary or extrapulmonary), or it can be isolated, which is the case with our patient. Parietal tuberculosis can affect individuals regardless of age or sex; it can even, more rarely, affect children [7, 8, 9].

Thoracic cold abscess is characterized by the absence of specific clinical signs [4, 6, 10, 11]. The firm and painless parietal mass, rarely fluctuating, coupled with a lack of inflammatory signs, initially suggests a tumoral cause rather than an infectious origin [3, 4]. Fistula can occur in infections other than tuberculosis, such as actinomycosis or pyogenic microorganisms. Tuberculous abscesses are often solitary but can be multifocal. The occurrence of cold abscesses in the thoracic wall in an endemic region, along with signs of tuberculosis exposure, should raise suspicion of parietal tuberculosis. This is in line with our case.

The diagnosis of parietal tuberculosis remains challenging despite the advancements in modern imaging techniques due to the lack of specificity in radiological signs [5, 6, 11, 12]. Chest X-ray can sometimes reveal the presence of an abscess and help search for an associated focus of pulmonary tuberculosis, or it can appear normal, as is the case with our patient. Ultrasound highlights a hypoechoic, heterogeneous image with unclear or well-defined boundaries, often with posterior reinforcement and occasionally some calcifications [4, 5, 6, 10]. Thoracic computed tomography shows a heterogeneous density mass with central hypodense areas indicating necrosis, occasional calcifications, and bone and cartilage destruction [5, 6, 12]. It aids in identifying underlying pulmonary or pleural lesions and/or other tuberculous locations [5]. While ultrasound and computed tomography scan can confirm the parietal abscess, they provide limited evidence in favor of its tuberculosis origin [5]. The diagnosis remains challenging because the tuberculous cold abscess can mimic neoplastic tumor pathology, especially in elderly subjects.

The definitive diagnosis is bacteriological and is based on the detection of the Koch bacillus (BK) through direct examination or by culturing pus samples. Extrapulmonary tuberculosis (EPTB) being paucibacillary, positive direct smear examination is rare. With a sensitivity of 77.3% and specificity of 98.2%, the GeneXpert represents a good alternative to microscopy [13]. P. Ouedraogo et al., in a study involving 11 patients with thoracic wall tuberculosis, found a positive Xpert MTB/RIF result in pus samples from all cases [14]. This result aligns with the case we are reporting.

Just like molecular biology, especially in cases of its inaccessibility, histological examination of tissue biopsies or surgical excisions contributes to the positive diagnosis of EPTB. It reveals a giganto-cellular epithelioid granuloma with caseous necrosis. However, other etiologies like non-tuberculous mycobacteria, fungal infections, brucellosis, or syphilis can pose challenges in differential diagnosis. This highlights the importance of supplementing with culture or Xpert MTB/RIF testing on biopsy fragments to confirm the tuberculosis origin. An anatomopathological examination requires the sample to be placed in formalin, which destroys mycobacteria and prevents subsequent confirmation through culture. Therefore, biopsy material for mycobacterial culture must be submitted fresh or in a small quantity of sterile saline solution [15, 16].

For our case, the histological examination of the operative specimen allowed us to establish the diagnosis of thoracic parietal tuberculosis, and both the bacteriological examination of the deep pus and the GeneXpert test were positive, which confirmed the diagnosis.

The therapeutic management of tuberculous thoracic abscess remains equivocal. A review of the literature often reveals a medical aspect involving anti-bacillary chemotherapy combined with a surgical component. The management of extra-pulmonary tuberculosis follows the same treatment protocols as pulmonary tuberculosis, adapted to the resistance profile [15]. The optimal duration of therapy is debatable. Although 6 months of standard anti-TB medical therapy is generally considered adequate for most forms of EPTB, longer treatment is suggested for TB meningitis and for bone and joint TB [15]. According to some authors, surgery is essential in the diagnostic and therapeutic approach to thoracic tuberculosis. It helps confirm the diagnosis, drain

the abscess, remove residual lesions, thus reducing the risk of recurrence [17-18]. Our patient underwent surgical excision of the cystic mass with pus drainage, followed by a 6-month anti-tuberculosis treatment.

The prognosis of tuberculous cold abscess is often favorable [3].

IV. Conclusion:

Isolated thoracic wall involvement is a rare form of tuberculosis. In the absence of other pulmonary or extrapulmonary lesions suggestive of tuberculosis, distinguishing a tuberculous cold abscess from a thoracic wall tumor is challenging, especially in immunocompetent elderly subjects. Only histological and/or bacteriological examination of biopsies from the mass allows for a correct diagnosis. In such cases, the importance of Xpert MTB/RIF in pus samples is emphasized, which has increased the detection rate of *Mycobacterium tuberculosis* and facilitated early detection of rifampicin resistance. Its prognosis is generally favorable with combined antituberculosis treatment and surgical intervention.

References:

- [1]. El Hassane Kabiri, Essotina Ayoub Alassane, Maruis Kemini Kamdem Et Al. *Abcès Froid Tuberculeux De La Paroi Thoracique : Une Expérience Clinique Et Chirurgicale. Rapport De 16 Cas (Série De Cas) Annales De Médecine Et De Chirurgie, Volume 51, Mars 2020, Pages 54-58.*
- [2]. WHO Report 2021.
- [3]. Hanane Benjelloun, Sanaa Morad, Nahid Zaghba, Abdelaziz Bakhtar, Najiba Yassine, Abdelkrim Bahlaoui. *Les Abcès Froids Pariétaux Thoraciques Chez Les Sujets Immunocompétents. Pan Africanmedical Journal. 2015; 20:161*
Doi:10.11604/Pamj.2015.20.161.5773.
- [4]. Mahouachi R, Zendah I, Taktak S, Chtourou A, Ben Chaabane R, Gharbi R. *Tuberculose De La Paroi Thoracique. Rev Pneumol Clin 2006 ; 62 : 56-8.*
- [5]. Trombati N, Afif H, Farouki Z, Bahlaoui A, Aichane A, Bouayad Z. *La Tuberculose Pariétale Thoracique En Dehors De L'immunodépression Par Le Virus De L'immunodéficience Humaine. Rev Mal Respir 2001 ; 18 : 301-4.*
- [6]. Fenniche S, Fekih L, Hassene H, Hantous S, Belhabib D, Megdiche ML. *Tuberculous Thoracic Parietal Abscess. Report Of 4 Cases. Tunis Med 2003 ; 81: 738-42.*
- [7]. Ka A.S., Brousse V., Diakhaté I., Sermet-Gaudelus I., Lenoir G., Imbert P. *Tuberculous Cold Abscess Of The Chest Wall In Children: A Report Of 3 Cases. Arch. Pediatr. 2006;13(9):1265–1266. [Pubmed] [Google Scholar].*
- [8]. Paik H.C., Chung K.Y., Kang J.H., Maeng D.H. *Surgical Treatment Of Tuberculous Cold Abscess Of The Chest Wall. Yonsei Med. J. 2002;43(3):309–314. [Pubmed] [Google Scholar].*
- [9]. Supe A.N., Prabhu R.Y., Priya H. *Role Of Computed Tomography In The Diagnosis Of Rib And Lung Involvement In Tuberculous Retromammary Abscesses. Skeletal Radiol. 2002;31(2):96–98. [Pubmed] [Google Scholar].*
- [10]. Bouslama K, Bakir L, Ben M'rad S, Aloulou R, Hendaoui L, Ben Salah N. *Tuberculose De La Paroi Thoracique. A Propos D'un Cas Et Revue De La Littérature. Med Mal Infect 1998 ; 28 : 666-7.*
- [11]. Chen CH, Shih JF, Wang LS, Perng RP. *Tuberculous Subcutaneous Abscess : An Analysis Of Seven Cases. Tuber Lung Dis 1996 ;77:184-7.*
- [12]. Mathlouthi A, Ben Mrad S, Meral S, Friaa T, Mestiri L, Ben Miled K. *La Tuberculose De La Paroi Thoracique : Mise Au Point À Partir De 4 Observations Personnelles Et Revue De La Littérature. Rev Pneumol Clin. 1998 ; 54 :183-6.*
- [13]. Jabri, H., Lakhdar, N., El Khattabi, W., & Afif, H. (2016). *Les Moyens Diagnostiques De La Tuberculose. Revue De Pneumologie Clinique, 72(5), 320–325. Doi:10.1016/J.Pneumo.2016.06.003.*
- [14]. Quedraogo, P., Doumbia, M., & Cisse, M. F. (2018). *Apport De L'Xpert MTB/RIF Dans Le Diagnostic De La Tuberculose De La Paroi Thoracique. Revue Des Maladies Respiratoires, 35, A266– A267. Doi:10.1016/J.Rmr.2017.10.629.*
- [15]. Ji Yeon Lee, M.D. *Diagnosis And Treatment Of Extrapulmonary Tuberculosis. Tuberc Respir Dis 2015; 78:47- 55. Http://Dx.Doi.Org/10.4046/Trd.2015.78.2.47.*
- [16]. Zumla A, James DG. *Infections Granulomateuses : Étiologie Et Classification. Clin Infect Dis. 1996 ; 23:146–158.*
- [17]. Kilani, T., Boudaya, M. S., Zribi, H., Ouerghi, S., Marghli, A., Mestiri, T., & Mezni, F. (2015). *La Chirurgie Dans La Tuberculose Thoracique. Revue De Pneumologie Clinique, 71(2-3), 140– 158. Doi:10.1016/J.Pneumo.2014.03.005.*
- [18]. Kim YT, Han KN, Kang CH, Sung SW, Kim JH. *Complete Resection Is Mandatory For Tubercular Cold Abscess Of The Chestwall. Ann Thoasurg2008;85:273—7.*