DIAGNOSTIC AND THERAPEUTIC DIFFICULTIES IN A CASE OF TUBERCULOUS EMPYEMA WITH ATYPICAL MYCOBACTERIA

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DIAGNOSTIC AND THERAPEUTIC DIFFICULTIES IN A CASE OF TUBERCULOUS EMPYEMA WITH ATYPICAL MYCOBACTERIA (Abstract): We report a 48 years old patient who developed a residual cavity with empyema after a decortication performed in another unit 1,5 years ago, which had been treated with repeated thoracenthesis, tube thoracostomies and antibiotic treatments. All the bacteriologic probes were negative for tuberculosis but pathologic examination of pleural deposits removed during decortication was not performed. We performed an one-stage thoracopleuroplasty on 7 ribs, Boțianu personal procedure. Postoperative course was initially favourable, followed by development of a residual cavity with a volume reduced to half of the initial one, which was treated by a modified Eloesser open-window procedure. Pathologic examination of pleural deposits showed specific inflammation which explains the unfavourable evolution in the absence of a tuberculostatic treatment. Healing was achieved by daily dressings and full antituberculous treatment. Pathologic examination of pleural deposits removed during surgery is mandatory since it may diagnose specific inflammation and change the treatment and outcome. Absence of a correct etiologic diagnosis and treatment explains failure of multiple procedures requiring an open-window for the local control of infection.

KEY-WORDS: TUBERCULOSIS EMPYEMA, ATYPICAL MYCOBACTERIA, OPEN WINDOW

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INTRODUCTION

Although the pleural involvement in thoracic tuberculosis (TB) is quite common, its diagnosis is sometimes difficult. TB etiology must be taken into consideration (confirmed or excluded) in any patient with a pleural effusion. Confirmation of TB etiology is made by demonstrating the presence of mycobacteria in sputum and/or pleural liquid or through pleural biopsy (specific inflammation); the determination of high levels of adenosine-deaminase or interferon-gamma in the pleural liquid offers a reasonable diagnostic certainty [1]. Early diagnosis and introduction of a correct treatment are essential to allow a healing without sequelae and to avoid the extension of lesions and the need for major surgical procedures, sometimes mutilating [2].

CASE REPORT

We present a 48 years old male with a history of a right pleural effusion treated with antibiotics 6 years ago and a thoracotomy performed in another unit 1,5 years ago, with removal of a right pleural hematoma. Postoperative course was complicated by the development of a residual cavity with empyema which required several hospital admissions during which conservative treatment (repeated thoracenthesis, prolonged pleural drainage with lavages, antibiotic treatment using different combinations) was tried without success. A
bacteriologic examination of pleural fluid performed at 7 weeks after thoracotomy showed the presence of methiciline-resistant staphylococcus aureus and the patient received antibiotics according to the antibiogramme.

We emphasize that all the bacteriologic probes for mycobacterium were negative, but a pathologic examination of the deposits removed during the iniitial thoracotomy was not performed.

The patient was referred to our unit for solving this post-surgical empyema with a mild alteration of general state, febrile – 38-39 °C and a significant weight loss (10 kg during the last 3 months). Laboratory findings showed a mild anemia (Hb 11,2 mg%, Hc 34,7%) and moderate leukocytosis (12000/ml). Functional respiratory tests showed a mild mixed ventilatory disfunction (VC 49,8%, FVC 48,7%, FEV1 44,8%).
Chest radiographs (Fig. 1) and CT (Fig. 3) showed a multiloculated empyema with compression atelectasis of the subjacent lung, with air bubbles inside; both visceral and parietal pleura are very much enlarged and with calcar deposits.

Surgery consisted of an one-stage 7 ribs thoracopleuroplasty (Boţianu personal procedure), with a closed-circuit irrigation-aspiration system. The initial course was favourable – stable hemodynamic and respiratory status, afebrile (Fig. 4).

![Fig. 4 Bedside chest radiograph on postoperative day 1 Good obliteration of the empyema cavity](image1)

![Fig. 5 Thoracic CT scan after thoracopleuroplasty Viable muscle flaps and residual cavity (volume reduced to about 1/2)](image2)

Bacteriologic examination (intraoperative probe of pleural pus) showed the presence of Pseudomonas aeruginosa and Acinetobacter spp, and the antibiotic treatment was changed according to the antibiogram. The cultures for mycobacterium tuberculosis were all negative.

On postoperative week 4 the patient becomes subfebrile again, with no resolution after change of antibiotics. CT scan showed a residual cavity with a volume reduced to half of the initial one (Fig. 5). The patient was reoperated at 5 weeks after thoracopleuroplasty, when we performed a modified Eloesser open-window through partial reopening of the thoracotomy associated with a vertical incision towards the axilla (resembling with the technique of radial incision resulting in a triangular stoma recommended by Galvin [3]). The thoracic wound was left opened with daily dressings. Local evolution was slowly favourable. After 7 weeks, there
was a tendency for early closure of the stoma which required a new widening in general intravenous anesthesia.

Pathologic examination of the pleural deposits removed intraoperatively, which was available only after 6 weeks, showed the presence of active tuberculous lesions (Fig. 6); we started a specific treatment with a complete scheme (Isoniazid, Rifampin, Pyrazinamide, Ethambutol, Streptomycin, Ciprofloxacin).

![Fig. 6 Pathologic examination of pleural deposits removed during thoracopleuroplasty](image)

Epitheloid cells, lymphoplasmocytic infiltrate, Langerhans cells and necrosis

Under complete tuberculostatic treatment associated with daily dressings, the evolution was slowly favourable, with progressive resolution of the cavity. At 9 months after surgery the patient is afebrile, with an improved general state and weight gain, able of medium physical effort and a mild improvement of the respiratory functional status. The cavity eventually healed through retraction and secondary epithelisation (Fig. 7,8). The patient refused any other major procedure to obliterate the empyema.

**DISCUSSIONS**

Known since antiquity, TB infection remains one of the most common infectious diseases worldwide, being declared by WHO in 1993 as “a global health emergency”. Recent reports show every year about 8 millions new cases and 3 millions deaths caused by this disease [4]. The situation is explained by [5,6]:

- increased number of immunocompromised patients (HIV, chemotherapy, transplantation etc.);
- lack of financial and organizatoric resources to combat this infection in the countries with high prevalence;
- increased incidence of infections with multi-drug resistant mycobacteria;
- diagnostic and/or therapeutic errors;
- immigration from endemic zones.
During last years, many authors consider that the TB infection from our days is different from that of the “classic” era - after discovery of tuberculostatics (1950-1970) [5,7,8]. One of the reasons sustaining this theory is the growing incidence of infections with atypical mycobacteria with atypical clinical presentations, more difficult to diagnose and to treat. Table I shows a classification of these mycobacteria based on recent refinements of the laboratory techniques [9].

The case is illustrative for the diagnostic difficulties encountered in our country. Diagnosis of TB infection was made by pathologic examination of the pleural deposits and pleural fragments removed during thoracopleuroplasty, which was available at 6 weeks postoperative. All the previous cultures from sputum and pleural liquid performed during over one year in more units – both of pneumology and surgery - where the patient had been admitted, were negative. The cultures from pleural liquid and pleural fragment removed during thoracopleuroplasty were also negative for TB. Some of the tests which would have allowed an earlier diagnosis were not available:

- determination of adenosine deaminase and interferon-gamma levels in the pleural liquid are not used in our country;
modern methods for fast demonstration of mycobacteria (BACTEC, PCR, monoclonal antibodies), special culture-mediums and the possibility to achieve extended antibiogrammes are available only in very few highly-specialized units [10].

Table I
Pathogenic and potential pathogenic mycobacteria in humans (adapted from Shields 2000)

<table>
<thead>
<tr>
<th>Mycobacterium tuberculosis complex</th>
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<tbody>
<tr>
<td>- Mycobacterium tuberculosis</td>
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<tr>
<td>- Mycobacterium bovis</td>
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<td>- Mycobacterium africanum</td>
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<th>Non-tuberculous Mycobacteria</th>
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<tr>
<td>- Photochromogens: kansasii, marinum, simiae, asiaticum</td>
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<tr>
<td>- Scotochromogens: scrofulaceum, xenopi, szulgai, gordonae</td>
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<tr>
<td>- Nonchromogens: avium, intracellulare, malmoense, ulcerans, paratuberculosis,</td>
</tr>
<tr>
<td>- haemophilum, genavens</td>
</tr>
<tr>
<td>- Rapid growth: fortuitum, peregrinum, chelonei</td>
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The consequence was the diagnosis of TB infection at almost 1.5 years after the first surgical procedure, through pathologic examination of the pleural deposits and pleura removed during the second major surgical procedure. Absence of a specific treatment explains the unfavourable evolution after the first thoracotomy with evacuation of a pleural hematoma, prolonged drainage and eventually thoracopleuroplasty, with development of a residual cavity requiring a modified Eoessser open-window procedure with a prolonged daily care. This procedure was originally described (1935) for the treatment of TB empyema, being almost abandoned after introduction of modern antibiotics and tuberculostatics [11]. It was repopularized in the 1970’s, initially in the post-pneumonectomy empyema, than in other types of empyema too [12]; during recent years, it has a certain regain of popularity but it’s indications remain limited, mainly because it opposes the advantage of a rapid and simple procedure with the disadvantage of a very slow healing – months or even years, during which it requires daily dressings [13-15].

CONCLUSIONS
The situation from our country, characterized by the rise of the TB incidence and of the proportion of infections with atypical mycobacteria, makes it mandatory to take into consideration this diagnosis even in apparently ordinary cases, especially in case of an unfavourable evolution. Absence or limited access to some modern diagnostic procedures (special culture methods, PCR, determination of the level of adenosine deaminase or interferon-gamma in the pleural liquid) makes the diagnosis of these atypical forms of disease more difficult. The consequence is the loss of control of the evolution of TB infection, leading to prolonged treatments and mutilating surgical procedures.

REFERENCES