NON-TUBERCULOUS PLEURAL EMPYEMA – RETROSPECTIVE STUDY, AUGUST 2007-AUGUST 2012 WITHIN THE THORACIC SURGERY DEPARTMENT BELONGING TO THE PNEUMO-PHTISIOLOGY HOSPITAL ”LEON DANIELLO” IN CLUJ-NAPOCA

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Abstract

Background. *Empyema is defined as the presence of pus within pleural cavity and is accompanied by a substantial morbidity and mortality.*

Aim, Methods. *This is a retrospective study of the cases of non-tuberculous pleural empyema, hospitalized and treated in the last 5 years and it research the identification of the demographic, clinical, bacteriological, surgical aspects and the postoperatory follow-up in pleural empyema.*

Results. *We've studied 216 cases of which 26 women and 190 men aged between 22 and 88 years old (with a mean of 54 years), most of the patients were retired (55%), unemployed (11.76%), with social sustainer (5%), employed (22%), other categories (6%). 171 patients (79%) were with significant comorbidities, and almost 90% patients arrived in our service after they were investigated and treated in different medical services, and were considered as chronical or hyper-chronical empyemas. Most of the empyemas were parapneumonic (116; 54%), the rest of them being complications either of pulmonary abscess/gangrene, bronhopulmonary neoplasms, carcinomatous pleural effusion, or of postoperatory (thoracic or abdominal interventions) causes, or due to mediastinal suppurations, eso-broncho-pleural fistulae, pulmonary hydatid cysts, neglected pneumothorax, subphrenic abscess. The diagnosis was based upon imagistic methods, thoracentesis, bacteriological and blood analysis. In only 25% of the patients a specific implicated bacteria was detected. Surgical methods consisted of closed pleural drainage using a drainage tube (140), pulmonary decortications (160), open pleural drainage (13), atypical resections (18) lobectomy (8). The mean of hospitalization days was about 21 (between 10 and 61 days). We have registered 10 deaths in the hospital, and 28 patients were discharged with a residual pleural cavity.*

Conclusions. *Pleural empyema, as a pathology that was diagnosed and treated since ancient times, still represents a challenge among thoracic surgeons. It is more frequent in patients over 50 years, of poor material condition, with comorbidities, and suffering from chronic alcohol consumption. The agent was only found in a small percentage. Chosing the adequate surgical method and medical treatment represent the success in treating this pathology.*

Keywords: non-tuberculous pleural empyema, treatment.

Introduction

Empyema is defined as the presence of pus within a natural cavity of the organism. One of the most frequent varieties of empyema is the thoracic empyema which can be localised (encapsulated) or can involve the entire pleural cavity [1]. The presence of pus in the pleural cavity was noriced since the antiquity by Hippocrates, who described the pleural empyema and drew the attention upon the gravity of this pathology by saying: ”When the empyema is opened with knife or cautery, if the pus that flows after opening is pale and white the patient will survive, but if the pus is mixed with blood, muddy and foul smelling the patient will die“ [2]. Pleural emyema can be tuberculous (specific), nontuberculous (nonspecific) or mixed (specific plus nonspecific); this classification is important not only in identifying the pathogenetic agent, but also because

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of the different approach in managing theese patients. The ethiopahogeneis of nontuberculous empyema varies widely and is explained by the contamination of the pleural cavity from a neighbouring source in 50-60% of the cases (pulmonary, mediastinal, subdiafragmatic, profound cervical, thoracic wall, verebral column) or by direct inoculation of the pleural cavity in 30-40% of cases (minor surgical interventions, postoperatory, posttraumatic) or from other causes 1%, by hematogenous infection of the pleural space [3]. The American Thoracic Society (1962) defines 3 distinct stages in the evolution of the pleural empyema, in 1995 Richard W. Light concieves a new classification subdividing the evolutionary stage of parapneumonic empyema in 7 classes [4], this being an important aspect because the therapeutic approach is different according to the evolutionary stage of the disease. Even if this is a known pathology since ancient times it still remains nowadays a medical and surgical challenge, 36% to 65% of the patients cannot be treated just by conservative medical therapy and need a surgical treatement [5,6]. Despite the evolution of diagnostic methods, medical and surgical treatment, this pathology comes with a significant morbidity and mortality. The present research represents an observational retrospective study and is interested in identifying the demographic, clinical, bacteriological, therapeutical and evolutionary aspects of the cases with nontuberculous pleural empyemas admitted in the thoracic surgery service, belonging to the Pneumoftiziology Hospital "Leon Danielo" in Cluj-Napoca within the last 5 years.

Material and Methods

This study is based on the information obtained from the medical records of 216 patients admitted into our service between august 2007 and august 2012 bearing the diagnosis of nontuberculous plaural empyema. We took into account the age, sex, occupation, comorbidities, ethiopahogenesis and evolutionary stage of the disease, diagnostic methods (anamnestical, biochemical, imagistical, bacteriological), applied treatment (medical and surgical), hospitalization and the state of the patient at discharge.

We mention that most of the patients have attended our service after being investigated and treated in other medical or surgical services and we have not taken into account the data related to the management of these patients in the respective services. The obtained data was statistically processed and presented in tabels and diagrams.

Results

We've studied 216 cases of which 26 women and 190 men aged between 22 and 88 years old (with a mean of 54 years) (see figure 1). Approximately 90% of the patients were admitted to our service after they have already been investigated and treated in several, different medical services (between 2 and 6 weeks) and presented chronic or hyper-chronic forms of pleural empyema, the rest of them were admitted into our service as their first ever presentation to such a service by passing through the emergency unit. Most of the patients were retired (55%), but also unemployed (with partial insurance or no medical insurance) (12%), with social sustainer (5%), employed (22%) and other categories (6%) (see figure 2).

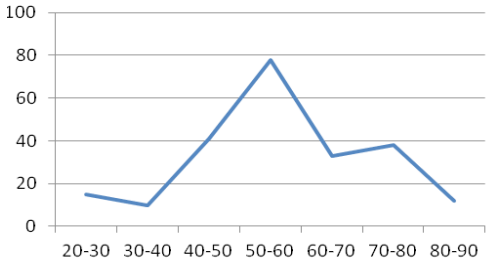

Figure 1. Age distribution.

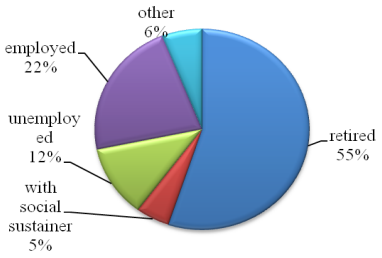

Figure 2. Financial resourceses.

171 patients (79%) were with significant comorbidities such as Diabetes Mellitus, chronic ischemic cardiopathy, cardiac insufficiency, chronic alcohol consumption, toxic or viral hepatitis, hepatic cirrhosis, renal insufficiency. In our service we haven't treated patients with HIV contamination or with AIDS.

Most of the empyemas were parapneumonic (116; 54%), the rest of them being complications either of pulmonary abscess/gangrene, bronhopulmonary, carcinomatous pleural effusion, or of postoperatory (thoracic or abdominal interventions) causes, or due to mediastinal suppurations, eso-broncho-pleural fistulae, pulmonary hydatid cysts, neglegted pneumothorax, subphrenic abscess (see table I).

Table I.

Aetiopathogenesis	No of pacients	Deaths in the hospital
parapneumonic	116	1
pulmonary abscess/gangrene	17	2
bronhopulmonary or pleural neoplasm	22	3
after surgical intervention	18	3
posttraumatic	17	
mediastinal suppurations,	10	1
eso-broncho-pleural fistulae*	5	
subphrenic abscess	5	
complicated pulmonary hydatid cysts	4	
neglegted pneumothorax	2	

*this patients were transferred in other surgical department for surgical treatement and intensive care.

The diagnosis was based upon imagistic methods (thoracic radiography, thoracic and abdominal CT, thoracic and abdominal echography), thoracentesis using radiologic or echographic guidance, bacteriological analysis from sputum and bronchical aspirate; biochemical, bacteriological and cytological from the pleural liquid and blood analyses (including hemocultures in selected patients). In more than 80% of the patients a bronchoscopy was performed for diagnosis, bronchical aspitate prelevation or therapeutical purpose.

In only 25% of the patients a specific implicated bacteria was detected. It was found to be alpha hemolotic streptococcus, alpha hemolitic staphylococcus, staphylococcus epidermidis, MRSA, enterobacter spp, E. coli, alcaligenes spp, proteus spp, acinetobacter, pseudomonas aeruginosa, either single or in combination.

Surgical methods consisted of closed pleural drainage using a drainage tube with or without intrapleural lavage with antiseptic or antibiotic solutions (140), pulmonary decortications (160), open pleural drainage (13), atypical resections (18) lobectomy (8) topographic toracoplasty of pleural indication (8) and in 5 patients a thoracomyoplasty was performed for the residual pleural cavity (see table II). There have not been used any proteolytic enzymes in the pleural cavity.

Table II.

Surgical procedures	No. of patients
pleural drenage/pleural lavage	24
pleural drenage/pleural lavage + early decortication	10
pleural drenage/pleural lavage + thoracotomy and decortication	98
pulmonary decortication	44
pleural drenage/pleural lavage + decortications + pulmonary resection	9
pleural drenage/pleural lavage + decortications + pulmonary resection + thoracoplasty	6
pleural drenage/pleural lavage + decortications + pulmonary resection + thoracomioplasty	3
open pleural drenage with rib resection	5
Eloesser window thoracostomy	7

The mean of hospitalization days was about 21 (between 10 and 61 days).

We have registered 10 deaths in the hospital, and 28 patients were discharged with a residual pleural cavity. 12 patients were transferred in other medical services and 14 patients were discharged at home for paliative treatment. 157 cured were registered 70%.

Discussions, Conclusions

Pleural empyema, as a pathology that was diagnosed and treated since ancient times, still represents a challenge among thoracic surgeons. Because only 10 % of the patients were fistly admitted in our service as their only medical presentation, for the respective complaints, and the rest were investigated and treated in other medical services, 90% of the cases were considered as chronical or hyper-chronical empyemas. We consider that this aspect is important to be noticed because we have several aspects to discuss. On one side the late diagnosis of the disease and the tendency of the medics to manage the cases a long period of time without using invasive methods of treatment and on the other side the fact that the management of the chronical empyema implies an aggressive surgical approach, long hospitalization and high costs. Also, we must not forget the lack of medical education of the patients that from various reasons attend a doctor too late. Most of the patients had over 50 years, most of them were males of poor material condition with comorbidities and suffering from chronic alcohol consumption. Another important aspect that we need to mention is related to the identification of the bacteriologic agent incriminated in triggering the disease. The agent was only found in a small percentage (35%) a situation that can be explained by the administration of antibiotic therapy in several different medical services, before the patients were admitted into our service. We can also incriminate the incorrect methods of prelevation, storage, manipulation and processing the pathologic product; also we had problems with the lack of culture plates. This situation was also described by other series of patients within other services of thoracic surgery [7].

From an ethiopathogenetic point of view there is a predominance of parapneumonic empyemas (54%) a situation that is in concordance with other studies [8,9,10] followed by empyemas in the context of neoplasic pleuropulmonary diseases 10%, postoperatory empyemas 8.3%, posttrauamtic 7.8% and followed by empyemas of a rare causes (mediastinal suppurations, eso-pleural or eso-broncho-pleural fistulae, subfrenic abcesses, complicated pulmonary hydatid cysts, neglected pneumothorax) (see table I).

The surgical procedures that we applied were various (see table II) and we must also mention that in our service we have not used intrapleural proteolytic enzymes. Also the toracotomy and early decortication where prefered to the videoassisted thoracoscopy from reasons related to the surgeons experience and preference taking into consideration the relatively recent acquisition of the videothoracoscope in our service. The right choice regarding the surgical method and medical treatments is the key to treating this pathology. The obtained results (70% complete cured and 10% inhospital deceased) are corresponding to the data in literature [11,12,13].

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