CLINICAL PATTERN OF PLEURAL EFFUSION TODAY

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THESIS

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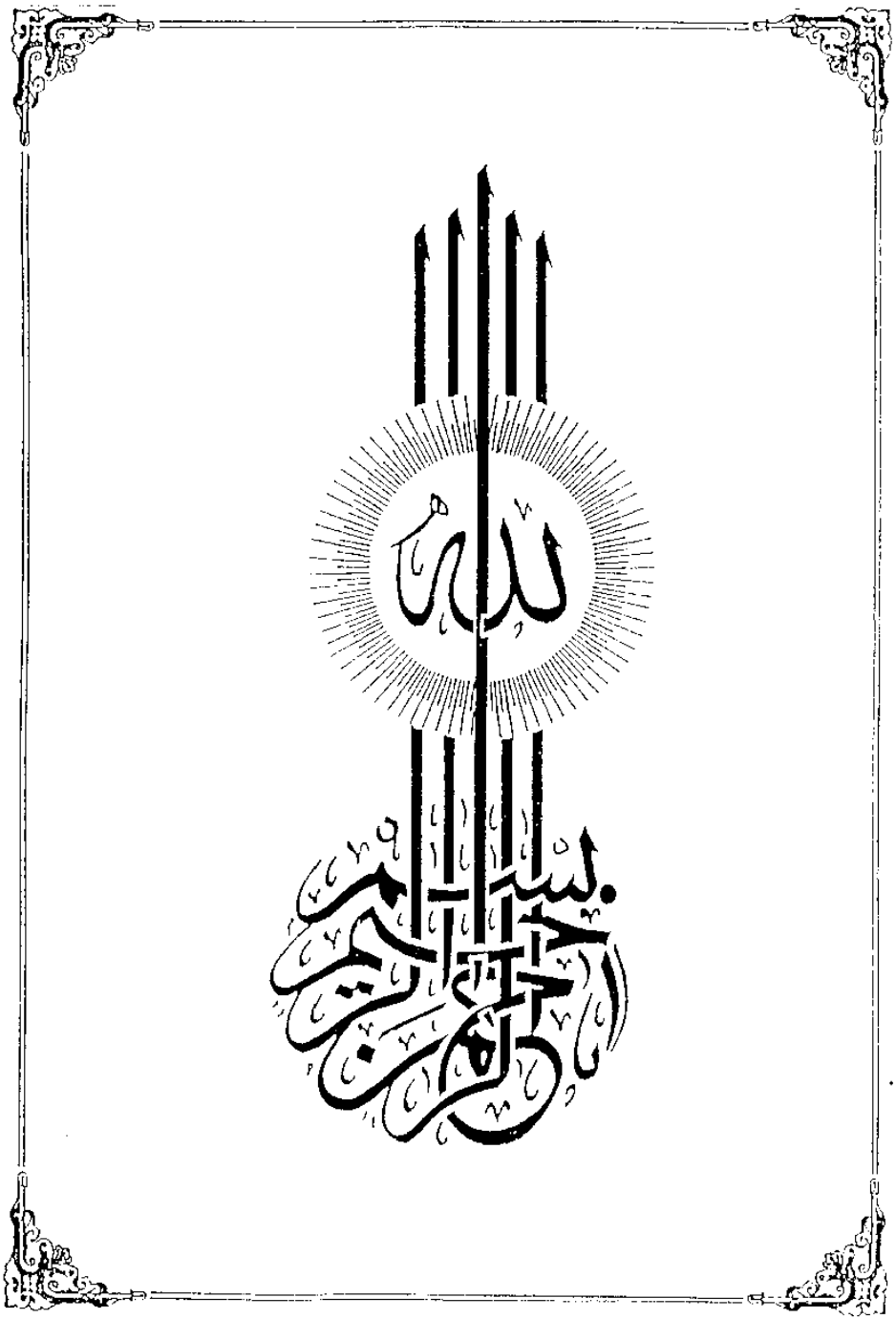

I N D E X

INTRODUCTION

Suppurative diseases of the chest have been known since antiquity.

Hippocrates recognised empyemas of the thorax & described the diagnosis & treatment. He recommended drainage, but the difficulty of making an accurate diagnosis & the lack of practical surgical methods made recognition & successful treatment rare. Graham & Bell of the United States Army's empyema commission placed the treatment of this entity on a rational basis in 1918. Their observations of the natural history of empyema resulted in logical use of closed & open drainage which dramatically reduced the mortality associated with empyema.

The importance of suppurative diseases of the chest specially empyema has declined dramatically since the advent of antibiotics.

In spite of antibiotics however there was an impressive increase in incidence of both staphylococcal pneumonia & empyema in children during the late 19505. Such recrudescenses of infections can surely be expected again. To day, because of the increasing age & debility of patients with empyema who have an underlying

serious illnesses this disease may still pose serious problems of diagnosis & management. So we shall study the changing pattern of pleural infection nowadays , as regards to etiology, pathology, bacteriology & management among 30 cases of pleural infections.

HISTORICAL BACKGROUND

Opening in the pleural cavity was feared by surgeons until the early part of the 20th. Century.

Experience with bottle injuries in wars throughout the previous centuries has repeatedly demonsterated the rapid lethal effects that might ensue when a gaping hole in the chest wall resulted in collapse of the lung & mediastinal shift. Therefore surgeons devised various ways in which certain portions of the thorax might be approatched without opening into the pleural cavity.

In the latter part of the 19th century it became obvious that if the lung was attached to the chest wall as a result of adhesions in the pleural space on opening into the pleural cavity was better tolerated.

This led to the development of staged operations with the creation of pleural adhisions as the first step.

Even to-day the value of viscero-parietal adhesions, which seal off a part of the pleural space, deserves recognition in certain situation.

Rapid strides in knowledge about open pneumothorax occured around the time of the first world war, although the fundamental methods of controlling lung expansion in the presence of an open chest were developed a few

years prior to that time.

Since then the advances in anaesthesiology has permitted transpleural operations to be carried out with ever-increasing savety.

In the early decades of the 20th century, pleural empyema was one of the most common problems faced by the surgeons interested in the thorax. During the 1st world war the empyema commision contributed greatly to our knowledge about the treatment of empyema (Graham & Bell, 1918). Eggers 1923).

At that time pneumonia was frequently complicated by the development of an empyema.

Pleural infections were also frequently seen as a complications of suppuration in adjacent areas or with septicaemia.

Although the availability of antibiotics & other newer chemotherapeutic agents has reduced the incidence of pleural infections, significant new problems have arisen because of the emergence of a sidferent group of pathogens, & because of alterations in the clinical manifestations of an empyema that may lead to a delay in diagnosis & proper treatment.

The development of pulmonary resection for a wide variety of diseases of the lung & the wider application of surgery to lesions of esophagus have resulted in post-operative pleural complications of various types. The management of pleural infections complicated by bronchial, tracheal or esophageal fistulaes, has presented a new challenge to the thoracic surgeon.

Great advances in the emergency treatment of sever chest trauma have required a reassessment of the management of pneumothorax & haemothorax in both civilian & battle casualties.

The past half century has witnessed a remarkable increase in knowledge about pulmonary function in various pathogenic states.

These studies have indicated the important effect that pleural disease may have on lung functions.

As a result the operation of decortication of the lung aimed at freeing lung tissues from a rigid pleural encasement which impairs ventilation has now become recognised as an important measure in conserving respiratory functions.

The value of surgical decortication of the lung was established by experience in second world war & has since been widely applied to civilian thoracic problems.

Aetiology and Predisposing Factors

The word empyema has been applied to collection of pus in body spaces or organs e.g. empyema of gall bladder, but when written without qualification it refers to thoracic empyema.

Definition :

Empyema = pyothorax = purulent pleural effusion :

An empyema is a pleural exudate which is Frankly purulent or contains a gross excess of pus cells. It may be localised to part of the pleural cavity or it may involve the whole pleural cavity.

Patients usually present with empyema as a secondary pathologic process.

With the advent of antimicrobial drugs the incidence of empyema has been greatly reduced.

In spite of antibiotics however there was an impressive increase in incidence of both staphylococcal pneumonia & empyema in children during the late 1950 S.

Farpour (1967) in a report of 31 patients coming mainly from a rural area where the indiscriminate use of antibiotics is uncommon, found that 14 cases were due to pneumococcus, 2 cases were due to H. influenza, 1 due

to paracolon & 12 cases were developed no growth.

The later was attributed to the administration of antibiotics prior to admission to the hospital.

The younger patients in his series were mostly children up to 4 years of age, had staphylococcal empyema.

The organisms proved to be sensitive to penicillin in 9 cases of 14.

Associated with the increased incidence of staphylococcal empyema there has been many reports on the percentage of cases of pneumonia that develop empyema.

To day because of the increase in age and the debility of patients with empyema who may have underlying serious illness, this disease may still pose serious problems of diagnosis and management.

Post pneumonic empyema :

The most common prior diseases are pneumonias e.g. lobar pneumonia, bronchopneumonia and lung abscess.

In a recent review of serotypically defined infections caused by streptococcus pneumoniae at children's

Hospital of Pittsburgh, Siegel, et al. (1978) found that pneumococcal pneumonias with pleural involvement were due to serolypes 1 and 3.

They also found in reviewing the cases of empyema admitted to the children's Hospital of Pittsburgh in the period between Jan. 1972 to March 1978, ten (10) patients of pneumococcal empyema were developed.

They reported that a non infectious underlying desease was found in only one child with an empyema, but one other child had varicella and 4 others had rhinitis at the onset of their illnesses.

They also found that the mean duration of hospitalization for those of empyema caused by type 3 pneumococcus was nearly twice of that for empyema due to other pneumococcal serotypes.

They also reported that type 5 pneumococcus had demonestrated as a causitive organism of pleural empyema.

It has been reported that the effective treatment of pneumonias with antimicrobial agents has reduced the frequency of empyema to less than 1 %. However the incidence is higher in necrotising pneumonias.

Niesseria catarrhalis had been isolated from a case of empyema in an immunodefficient patient as a

causitive organism of empyema. (Cox pM Jr, et al. 1979).

Ravitch and Fein (1961) in a review of cases of pediatric empyema at the John Hopkin's Hospital from 1934 to 1958, noted that the incidence of empyema is quite striking.

There were 82 cases during the period from 1934 to 1938. (Presulphonamide) with a steady and consistent decline to 6 cases in the period from 1951 to 1954. (Pencillin , streptomycin and chlortetracycline).

The abrupt rise to 38 cases in the period from 1955 to 1958 (Polyantibiotic) corresponds to the sharp increase in staphylococcal empyema. (35 - 38 cases).

In the period before sulphonamide came into use 10 % of children admitted with pneumonia developed empyema.

This figure diminished to 2 % in the period from 1951 to 1954. (Pencillin, streptomycin & chlortetracycline) to rise to 14 % in the period of polyantibiotics therapy.

Lionakis, et al. (1958) noted a fluctuation in incidence according to the season.

There is a definite seasonal peak during the winter and spring corresponding with that of the respiratory infections (Pont et al.) . However we can say that the incidence of empyema dropped in the early days of the antibiotic era, to rise once more particularly in the last decade.

This also was associated with a change in the causitive organisms.

Ravitch and Fein (1961) reported that the causitive organisms before the introduction of sulphonamides in 82 cases were as follows : 53 cases of pneumococcal empyema, 7 cases of streptococcal empyema 11 cases of staphylococcal empyema, 5 cases of Hemophilus influenza empyema , and the remaing 6 cases were caused by other organisms.

With the advent of penicillin the first sharp change occurred. Pneumococcal empyema accounted for 36 %, one case only was due to streptococcus and of the total of 31 cases, 32 % were due to staphylococci.

Kevy et al. (1961) reported empyema associated with 10 cases of 11 of streptococcal pneumonia.

It was stated that infants who may be weakened by minor illness as well as by nutritional difficiencies are

liable to develop staphylococcal pneumonia & empyema by virulent strains from adult carriers. (Groff et al.) (1966).

Groff et al. (1966) in a report of 20 cases seen in the period from 1959 to 1964, reported that 10 of them were due to staph. (8 of 10 were resistant to penicillin) and in 5 cases no growths were obtained. He also (1966), noted that an antecedent virus infection such as common cold is the most likely factor making the staphylococci invasive. Viral diseases of the respiratory that sp. influenza increase the susceptibility to staphylococcal infection.

About one third of staphylococcal pulmonary infection are secondary to primary septicaemia, the remaining cases either follow other predisposing respiratory infections or are idiopathic. (Pont et al.) (1963).

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