MINISTRY OF NATIONAL EDUCATION

UNIVERSITY OF MEDICINE AND PHARMACY CRAIOVA

PhD THESIS

ABSTRACT

CONTRIBUTIONS TO THE OPTIMIZATION OF THE SPONTANEOUS PNEUMOTHORAX MANAGEMENT

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INTRODUCTION

The spontaneous pneumothorax represent a respiratory disease which consists in the presence of the air in the pleural cavity, disease with an acute character and medico-surgical treatment.

The spontaneous pneumothorax may appear without any precise cause or it may lead to complications in other breathing diseases.

The symptoms may be dominated by phenomena of acute respiratory failure giving a dramatic character to thedisease, reason for which the surgeon's intervention is imperative.

The decision of the diagnosis implies the corroboration of the clinical and laboratory elements.

If 30-40 yeas ago the diagnosis was confirmed on the basis of the chest radiography, today the chest computerised tomography and ultrasonography contribute to a fast and precise diagnosis.

The thoracic surgeons always have been preoccupied by the treatment of the pneumothorax. Along the years the options of treatment have extended and perfected having as an aim the healing and recovery of the patient to be able to go back to his/her everyday activities.

In Romania the thoracic surgeon from the thoracic surgery clinics and from the thoracic surgery departaments of the county hospitals in cooperation with the lung doctors treat the patients wiyh primary and secondary spontaneous pneumothorax and they choose the surgical procedures that are better suited to the patient.

Which are these surgical procedures, how often they are used and what are the patient's benefit are some of the questions that represent the basis of this PhD thesis.

Key words: pneumothorax, chest radiography, surgical procedures

THE STAGE OF KNOWLEDGE

In Chapter 1 of this PhD thesis I presented general data about the spontaneous pneumothorax including the definition and its history the focus being laid on the classification of the pneumothorax in spontaneous primary and secondary, postraumatic and iatrogen pneumothorax. From this chapter we also find out the incidence of the primary spontaneous pneumothorax of 7.4 cases at 100,000 inhabitants a year in males and 1.2 cases at 100,000 inhabitants a years in females. For the secondary spontaneous pneumothorax the literature describes an incidence of 6.3 cases at 100,000 inhabitants a year in males and 2 cases at 100,000 inhabitants a year in females.

Chapter 2 offers etiological elements of the spontaneous pneumothorax represented in blebs, bubbles, but also an entity called Noppen „ pleural porosity". The chapter also presents the risk factors in starting the spontaneous primary pneumothorax such as smoking , changes in the atmospheric pressure, physical exercices and even loud music.

Chapter 3 describes the basic elements of the anatomy of the pleura and of the lung, elements that have a major importance for the surgeon.

The clinical symptomatology and the objective examination represent the contents of **chapter 4.** The most frecquent symptoms in the spontaneous pneumothorax are the chest pain felt by the patient in the form of a shooting pain, burning , a feeling of rolling over together with a dry cough.

Chapter 5 presents in detail the imaging means used to diagnose the spontaneous pneumothorax.The chest radiograph identified an area of increased transparency of various sizes, area which is located parietally and the lack of the lung drawing at the level of this area.

The positive radiographic diagnosis is mainly based on the identification of the visceral pleural line. Other imaging procedures in the spontaneous pneumothorax are the lung ultrasonography and the chest computerised tomography.

The evolution of the spontaneous pneumothorax with or without treatment represented the aim of of **chapter 6.**

Chapter 7 contains recent data in literature regarding multiple surgical procedures that can be used in the spontaneous pneumothorax starting with toracentesis, pleural dranaige, videoassisted thoracic surgery and ending with the classical intervention: axillary thoracotomy.

PERSONAL CONTRIBUTION

Chapter 8

Motivation of choosing the theme

I considered the theme of this PhD Thesis entitled „Contribution to the Optimization of the Spontaneous Pneumothorax Management" actual and very important one, the early diagnosis being an essential condition to promptly initiate the treatment and save the patient's life implicitly.
The spontaneous pneumothorax can be considered a breathing disease, curable or with a high potential of healing due to the multitude of surgical procedures that can be applied in specialized clinics and in the county hospitals.

Chapter 9

Objectives

The workpaper „Contribution to the Optimization of the Spontaneous Pneumothorax Management"documented in two sanitary units, one of them having a universitary character, has as its aims the achieving of the following objectives:
a)setting the frecquency of the primary spontaneous pneumothorax
b)setting the frecquency of the secondary spontaneous pneumothorax
c)setting the frecquency of the recurrent spontaneous pneumothorax
d)setting the frecquency of the surgical procedures applied in the spontaneous pneumothorax

Chapter 10

Material and methods

The present PhD Thesis is a retrospective, observational, descriptive study applied on 242 patients over a period of 5 years (January 2006-December 2010), on patients with a diagnosis of spontaneous pneumothorax who were hospitalised in the ,, Marius Nasta"Institute of Bucharest , in the Thoracic Surgery Clinic and in the County Hospital of Slatina, the Thoracic Surgery Departament.

Chapter 11

Results

Only in 2 cases of small right, spontaneous pneumothorax doctors opted for aspirative thoracentesis.Pleural drainage of the rest 240 patients was done in the operation room.

72% of the patients had a favourable evolution, managing to obtain the reexpansion of the lung which was shown on the lung radiograph. Only in 18% of the pateints with pleural drainage, the evolution was not favourable, the lung colabation being maintained.

The patients maintained the pleural drainage between 5 and 8 days.10 patients with secondary pneumothorax had a prolonged pleural drainage for over 8 days, the evacuation of the air being assured by the Heimlich valve with which the patients have left the hospital.From the clinical point of view, the dispnea persisted in the first 24 hours after the pleural drainage at the patients with secondary spontaneous pneeumothorax, the dispnea getting better gradually in the next 48-72 hours . The chest pain was present in the first 2 or 3 days after the drainage probably due to the existence of drainage tube. The irritating or productive cough persisted in 48% of the patients in the first 2 days, the cough being ameliorated along with the lung expansion.

In order to make a chemical pleurodesis , 11 patients with pleurotomy for the second episode of pneumothorax had an instillation of sterile talcum 5 g in 200 ml of physiological serum in the drainage tube.

The surgical intervention through thoracotomy or thoracoscopy led to fullfilling the objectives of the primary or secondary spontaneous pneumothorax, namely the lung expansion and recurrence prevention.

The surgeons used as a preferable way of acces the axillary thoracotomy. Thus for blebs were

practiced atypical rezections in 13 cases completed with mechanical pleurodesis.

For the primary or secondary spontaneous pneumothorax which reappeared the therapeutical attitude was similar, namely if the initial pleurectomy did not manage the lung expansion by the axillary thoracotomy were practiced atypical rezections of the right and left lung.

The superior lobectomy represent tue surgical intervention for 4 patients with recurrent secondary pneumothorax.

The thoracoscopy was practiced for 22 patients only by the thoracic surgeons from the ,, Marius Nasta" Institute from Bucharest.

Chapter 12

Discussions

The basic investigation in the primary or secondary spontaneous pneumothorax was the chest radiography.

The computerized tomography was useful in the small or recurrent pneumothorax

The treatment of the spontaneous pneumothorax was surgical , completed with medical treatment .

The pleurotomy represented the initial intervention in the primary and secondary spontaneous pneumothorax.

The pleural drainage was followed by the lung expansion in 72% cases . If the lung remained colabated after pleurotomy, additional surgical procedures were practiced such as chemical pleurodesis, thoracoscopy or thoracotomy. In the asymptomatic small pneumothorax the pleural aspiration was applied.

By the videoassited thoracic surgery and axillary thoracotomy was practised the rezection of the blebs and bubbles and the pleural ponsage was practised in the secondary and primary pneumothorax but also in the recurrent pneumothorax, too.

The surgical intervention had as an objective the lung expansion and the prevention of the recurrences.

The thoracic surgeons from the two sanitary units chose the surgical procedures according to the type of spontaneous pneumothorax, its size, the clinical symptomatology, the general health of the patient, his age and profession.

The recurrent pneumothorax remains the ,,touchstone" for surgeons, the surgical procedures being applied gradually.

Chapter 13

General Conclusions

1. The spontaneous pneumothorax represents a breathing disease which endangers the life of the patient if it is not treated correctly.

2. The methods of treatment are different according to the etiology of the pneumothorax , its size, its clinical symptomatology, age, profession, the existence of a chest surgery department and a competent medical team.

3. The work „Contribution to the Optimization of the Spontaneous Pneumothorax Management"

underlines the existence of common methods of treatment but also some peculiarities of the management of the spontaneous pneumothorax.

4. The pneumothorax affects the masculine gender, smoking being considered as a main factor in the appearance of the disease.

5. The lung diseases most frecquently associated with the pneumothorax were:the emphysema, lung tuberculosis, lung tumors, lung metastasis.

6. The clinical symptomatology of the patients when they were hospitalized was polimorphic, only 1% of the patints being asymptomatic.Some peculiarities related to the clinical symptomatology have been noticed.Thus severe dyspnea appeared in 34 cases of patients with secondary pneumothorax as a result of BPOC and lung tuberculosis or as a result of going too late to the doctor.Also, the hemoptysis appesred in 7 cases as a unique sign of debut in the lung tuberculosis.

7. The chest radiography discovered the pneumothorax thus being considered as a basic investigation of the disease.The time interval between the patient's presence to the doctor and the lung radiography was of about 15-20 minutes..The lung radiologicalaspect of the patient was polimorphous , the pneumothorax affecting the right lung in 152 cases while the left lung was affected in 90 cases.The radiological aspect of right pneumothorax appeared in 39% of cases in the secondary pneumothorax and only in 17% on the left lung.In the primary pneumothorax the distribution was almost equal, 24% on the right lung and 20% on the left lung.

8. The pulmonary computerised tomography, considered a gold standard in the diagnosis of the

small size pneumothorax, was applied either in emergency or a few days after the patients had come to the doctor.This high performance investigation confirmed the clinically suspected dignosis of pneumothorax and showed other associate lung lesions, in fact the causes of the lung colabation.Despite all these the period of time between the moment whenthe patient came to the emergency room and the computerised tomography was of about 40-50 minutes which was longer than in the above mentioned situation.

9. The thoracic ultrasonography was not used to confirm the diagnosis of spontaneous pneumothorax either by the thoracic surgeon from the „Marius Nasta"Institute of Bucharest or by the ones from the County Emergency Hospital from Slatina.

10. Among the treatment options at the surgeon'sdisposal thr pleurotomy was the intervention which led to the amelioration or disappearance of the symptomatology. In order to make the pleural drainage were used special kits withan underwater drainage system.

11. The pleurotomy was practiced both in the primary , secondary and recurrent spontaneous pneumothorax.

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