ANATOMICAL AND CLINICAL CORRELATION STUDY OF BRONCHIAL STUMP CLOSURE SECONDARY ADJUSTED LUNG RESECTION

PhD Coordinator: Klara Branzaniuc MD, PhD, Professor
PhD Student: Suciu Bogdan Andrei MD

Thesis titled “Anatomical and clinical correlation study of bronchial stump closure secondary adjusted lung resection” is divided into two parts: first part presents general aspects (5 chapters, 35 pages) and second part presents special aspects (2 chapters, 111 pages, including bibliography).

Chapter 1 presents anatomical descriptive elements of tracheal-bronchial tree, being focused on the description of anatomical structures and vascular anatomy of the elements.

Chapter 2 describes the histological structure of tracheal-bronchial tree, being focused on the description of cellular elements founded in these anatomical structures.

Chapter 3 presents available types of lung resection and their indications used in practice.

Chapter 4 describes main methods of bronchial stump suture, the advantages and disadvantages of each method separately also describes factors that promote healing of bronchial stump.

Chapter 5 presents the general concepts of healing and scarring tissue. This chapter presents the stages of tissues healing: angiogenesis, proliferation and migration of fibroblasts, fibrous scar formation and tissue remodeling factors.

Chapter 6 presents new methods for performance bronchial stump secondary to lung resection. To achieve this aim author used 15 experimental animals (15 rabbits). In all these animals was performed left inferior pulmonary lobectomy. Bronchial stump closure was performed in three different ways: surjet suture type, vycril patch isolated wire-reinforced suture type, and heterologous bovine pericardium patch insulated wire-reinforced suture type. After intervention all animals were euthanized in day 10 and were autopsied. Bronchial stump pieces were drawn and fixed in formalin, were applied sections stained with hematoxylin-eosin and Tricrom Masson and Van Giseon. Tissue samples were examined using optical
microscopy technique. The main conclusions of the experimental study were followed:

- Tissue healing is a dynamic and evolving process, starts with inflammation and is followed by fibrogenesis.
- The bronchial stump healing main histopathological changes are following: the appearance of inflammatory lympho-plasmocitar infiltrate, angiogenesis, bronchial epithelial hyperplasia with re-epithelization of sutured area, hyperplasia of smooth muscle, appearance of a neo-condro-genesis tissue, granulation peri-bronhial and intra-bronchial tissue.
- The healing histopathological changes occurred in all three groups, but their intensity and extend was more evident in the bronchial stump sutured with wire-reinforced with isolated patch of heterologous bovine pericardium. This result may be taking into consideration by cardiothoracic surgeons who wants to protect lung transplant anastomosis or bronchial stump suture performed for lung transplant interventions.

Chapter 7 presents a clinical observational retrospective trial focused on factors influencing short and long-term prognosis of patients who undergo surgical treatments for lung malignant tumors. 197 patients were included in this study. From January 1, 2005 to December 31, 2010, all patients diagnosed with lung tumoral malignancy admitted in Surgery Department of Clinical County Hospital Tg. Mures were included in our study. We studied followed parameters: the incidence of lung tumoral disease, correlation between age, male sex, demographics and smoking habits with lung malignancy disease. We recorded symptoms, associated pathology, localization of tumoral malignancy, histopathological type of tumor malignancy, disease stage and correlation with tumor type, tumor size, presence of nodal metastases; correlations between tumoral type and surgery treatment, the incidence of bronchial fistula and surgery treatment type, correlation between bronchial fistula appearance and associated disease. We also recorded followed parameters: after treatment complications, length hospital stay, overall mortality, morbidity and follow up exams at 1, 2, 3, 4, and 5 years after surgical treatment.

Our main results were followed:
• Mortality and morbidity secondary to pulmonary excision intervention are still very high. Pulmonary excision surgery treatments are major intervention who requires a rigorous selection of patients who undergo such interventions.

• Smoking remains the main risk factors for lung cancer.

• Male are more exposed to smoking than female and smoking represent an independent risk factor of lung malignant tumors.

• Lung cancer occurs mainly in 5th and 6th decade of life. We have observed a statistically significant difference between age and lung cancer between women and male patients.

• Lung cancer symptoms are polymorphic and nonspecific, and this is the reason why most patients are diagnosed in latest stages of disease. In our sample most patients are diagnosed later than stage IIB and IIIA.

• Urban areas residents usually are more frequently diagnosed and referred to Surgery Department than rural residents who will be admitted in more advanced stages of the disease, but we cannot exclude the importance of level of health education lacking also.

• More often patients diagnosed with lung malignant tumors has associated a complex pathology in addition to respiratory disease.

• Epidermoid carcinoma is the most common histological type of lung malignant tumor and adenoscuamous carcinoma is the second most common type.

• The incidence of epidermoid carcinoma is higher for male than female patients and incidence of adenocarcinoma and adenoscuamous carcinoma is higher for women than for male patients.

• We found a statistical significant relationship between the size of tumor and lymph node metastases occurrence.

• Epidermoid carcinoma tends to locate more centrally in the bronchial tree and adenocarcinoma more towards the periphery.

• Incidence of early bronchial fistula occurrence is higher for patients who received transfusion before surgical treatment, for those who had pneumectomy (right more often than left) and for those with diabetus mellitus disease.

• The main risk factor for late bronchial stump fistula occurrence is radiotherapy.
• Bronchial fistula occurrence has an important predictive value for poor long-term prognosis.

• The main risk factors for poor short-term prognosis are age, male gender, FEV'S low value, and pneumectomy.

• An important predictive value for mortality are age, male sex, type of surgery treatment, FEV'S low value and associated disease (cardiovascular and diabetus).

• Long term survival of patient who undergoes surgical treatment depends on pathological stage of malignant disease. The predictability value of this factor is high for patients aged over 60th years compared to patients aged under 60th.

• Predictability rate of descriptor N from TNM classification is better than T. The existence of different stages of the disease in the same T descriptor category show us that TNM classification has limits and still can be perfectible.

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