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CASE REPORT

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Treatment of Pleural Effusion after Lobectomy and Lymphadenectomy for Primary Lung Cancer: A Case Report

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Abstract

The majority of malignant pleural effusion (MPE) is caused by metastatic disease: most commonly lung cancer in men and breast cancer in women. MPE worsens the quality of life in patients due to the occurrence of respiratory failure, compression of internal organs and violation of homeostasis. Existing methods for MPE treatment have a number of disadvantages, including insufficient analgesia and the use of standard drainage tubes that do not adequately irrigate the pleural space with drugs, thereby reducing the drugs' effectiveness. The proposed method for the treatment of MPE improves the treatment results by improving the drainage and introduction of drugs into the pleural cavity. (**International Journal of Biomedicine. 2020;10(1):76-78.**)

Key Words: malignant pleural effusions • thoracentesis • pleurodesis

Introduction

Worldwide, the incidence of cancer and malignant pleural effusion (MPE) is increasing annually. There are more than 100,000 new cases of MPE yearly in Russia.[1-3]

MPE worsens the quality of life in patients due to the occurrence of respiratory failure, compression of internal organs and violation of homeostasis. Repeated thoracentesis has the potential risks of inducing hypoproteinemia, empyema and pneumothorax. Without adequate therapy, all these circumstances lead to decompensation of the main body systems and death in a short period of several months.[3,4] More than 800 ml of pleural effusion leads to respiratory failure, lung atelectasis that causes hypercapnia and hypoxemia.[3-5]

Existing methods for MPE treatment have a number of disadvantages, including insufficient analgesia and the use of standard drainage tubes that do not adequately irrigate the pleural space with drugs, thereby reducing the drugs' effectiveness.[4-6] As a result, palliative treatments are needed to effectively control pleural effusions and relieve symptoms.

The aim of our study was to improve the results of treatment of patients with MPE by improving the drainage and introduction of drugs into the pleural cavity.

"A method for the treatment of exudative pleurisy" was developed in the Department of Faculty Surgery at Ulyanovsk State University (Application for invention No. 2019103176; Priority of 02/02/2019) (Authors: Charyshkin AL, Toneev EA, Martynov AA, Khusnutdinov BI).

The proposed method is performed as follows: Thoracentesis is performed in the posterior axillary line (6 cm - 10 cm lateral to spine) at the level of the eighth intercostal space using a silicone tube with a diameter of 5 mm. A chest X-ray is performed one day after the pleural cavity drainage. If the pleural cavity is dry and the lung is fully inflated, the silicone tube is removed and replaced by a polyurethane catheter (a diameter of 2 mm). The inner part of the catheter, located in the pleural cavity, has 8 through holes with a diameter of 1 mm. As premedication, Tramal is intramuscularly administered, and 50 ml of Naropin (100 mg) and physiological saline 50 ml are injected through the catheter. The external end of the catheter is pinched and the patient lies in different positions for 30 minutes. Next, the clamp is removed and 30 ml of 10% Betadine solution and 60

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ml of Naropine (120 mg) are introduced through the catheter. The external end of the catheter is squeezed for 8 hours. During this time the patient is lying down, and every 2 hours changes the position of the body; then the clamp is removed and active aspiration is performed within 12 hours. Finally, the catheter is removed.

We believe that applying the developed method prevents purulent-inflammatory complications, which often develop with prolonged drainage of the pleural cavity.[3,7-9] The described technique is used in the Ulyanovsk Regional Oncology Clinical Dispensary and has been performed on 23 patients with a positive result.

Case presentation

A 54-year-old white male was admitted to the surgical thoracic department of the Regional Oncology Clinical Center of Ulyanovsk for surgical treatment with a diagnosis of a lung cancer of the right upper lobe. The planned operation: Right thoracotomy, upper lobectomy, and systemic lymph node dissection.

On Day 6 after surgery, the postoperative period was complicated by exudative pleurisy. We drained the pleural cavity according to the developed methods, and 400 ml of exudates was removed. A day after the pleural cavity was drained, an X-ray control was performed, which showed the dry pleural cavity and fully inflated lung. Subsequent stages of the intervention were performed in accordance with the method described above. After the active aspiration was completed, repeated X-ray examination showed the presence of a dry pleural cavity and fully inflated lung; the catheter was removed. Pain intensity according to the Visual Analogue Scale scored 2 points. The postoperative period was uneventful; wound healing passed by primary intention. The patient was discharged from the hospital in satisfactory condition under the supervision of an oncologist at his place of residence. The patient was examined after one year; no recurrence of the disease was detected.

The majority of MPE is caused by metastatic disease: most commonly lung cancer in men and breast cancer in women.[3,10-13] The presence of MPE indicates an advanced stage of the disease with a median life expectancy of 3 to 12 months, depending on the stage and type of underlying malignancy.[14] During the past two decades, there has been a change in direction in MPE research and management. Advanced, minimally invasive methods are becoming increasingly important.[3,15,16] Instead of aggressive surgical methods, the current treatment approach for patients with MPE is mainly aimed at alleviating symptoms and improving quality of life indicators, which is a key goal of treatment.[17]

Among treatment methods, two effective treatments recommended for recurrent MPE are pleurodesis and IPC placement, both of which can effectively improve dyspnea and quality of life of patients.[11,17-21] However, these treatments are also temporary, and MPE would recur soon. The proposed method for the treatment of MPE contributes to a pronounced analgesic effect, and reduces treatment time and recurrence of the disease. The described clinical case confirms the method's effectiveness.

Competing Interests

The authors declare that they have no competing interests.

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