SURGERY

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COMPLICATIONS OF BRONCHIAL BLOCKADE IN THE TREATMENT OF PYOPNEUMOTHORAX (pilote study)

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Abstract: The study deals with the use of bronchial occluders in patients with pyopneumothorax and techniques of the procedure. The authors described complications associated with the employment of bronchial blockade, and methods of their correction.

KeyWords: pyopneumothorax, bronchial occluder, bronchial blockade, bronchial fistula.

INTRODUCTION

Pyopneumothorax occurs in 33.3% of patients with nonspecific infectious lung disease [1, 5]. One of the pathogenic factors of chronic and pyopneumothorax is infringement of lung tissue impermeability, leading to the development of bronchial fistula [2, 4 and 7]. Successful closure of fistula makes surgical treatment of these patients more reliable and less prolonged [3, 6 and 7].

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2 PURPOSES, SUBJECTS and METHODS:

2.1 Purpose goal of the study was to evaluate the complications of bronchial blocade in the treatment of pyopneumothorax by using endoscopic bronchial fistula occlusion

2.2 Subjects & Methods

Our study involved 77 patients who underwent thoracoscopic debridement of pleural cavity and endoscopic bronchial blockade. The indications for endoscopic bronchial fistula occlusion included air in pleural drainages after thoracoscopic operation and X-ray picture of persistent residual cavity. Bronchial blockade was completed in 1- 2 days after operation. We used the endobronchial reverse valve, made of medical rubber compound compatible with human tissues. The valve permits air and bronchial content to move away from residual cavity, during expiration and prevents their reverse motion during inspiration.

Endoscopic bronchial occlusion was performed with imaging procedures: bronchoscope was introduced into the pleural cavity through the drainage of 20 ml of 3% stained hydrogen peroxide solution in a ratio of 10: 1. The procedure was performed under local anesthesia.

After identification of the bronchus associated with fistula, bronchoscope was extracted and the valve of the desired diameter was placed at its end. The diameter of the valve exceeded the diameter of the bronchus by 1.2-

1.5 times. Bronchoscope with a valve was administered orally in the tracheobronchial tree. The valve was fixed by biopsy forceps (inserted through the working channel of bronchoscope) for the jacket installed into the bronchus until it stopped. Then the bronchoscope was removed from the valve, holding the valve by the forceps (figure 1).

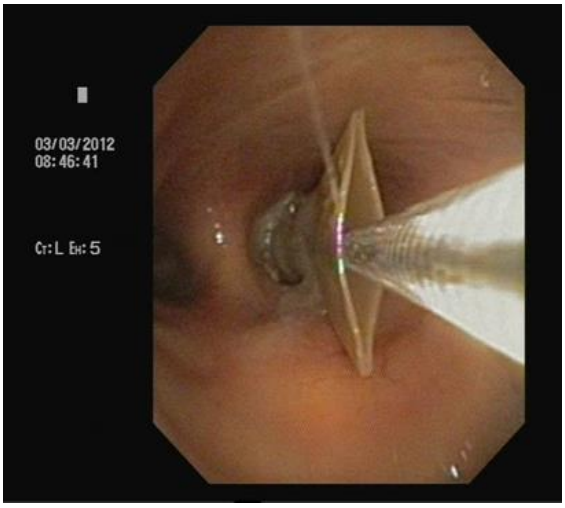

Fig. 1. Installation of the valve

During coughing it can be seen as the valve flaps open and release air (figure 2).

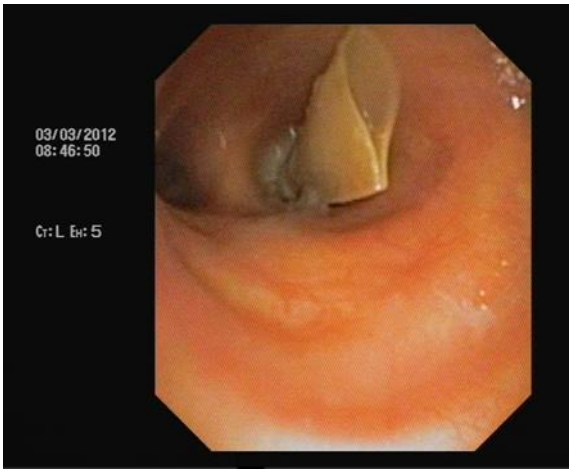

Fig. 2. Valve flaps release air.

In case of adequate valve function, bronchoscope was removed from the bronchial tree.

Conflict of interests

There is no conflict of interests.

3 RESULTS AND DISCUSSION

The most common complication was purulent bronchitis, being observed in 15 (19.5%) patients. This problem was due to valve operation features, the purulent contents of pleural cavity freely penetrated tracheobronchial tree through the fistula, but did not get back which resulted in its accumulation in the bronchial tree on the affected side, and sometimes in the opposite lung. This complication was suspected due to patients' presentation, namely difficult breathing, fever combined with increased white blood cell count, scattered dry and moist wheezing on auscultation. The diagnosis was confirmed by X-ray and bronchoscopic examination.

Patients with bronchitis underwent therapeutic bronchoscopy on a regular basis under local anesthesia. Active aspiration of bronchial secretions and irrigation of the tracheobronchial tree with anti-inflammatory, mucolytic and antibacterial agents were carried out under visual control. This procedure was carried out every day.

Inhalations were also performed using nebulizer therapy. We used 2-4 ml 20% -acetyl cysteine solution and 2 - 10 0.02% ml Decasanum solution 2 - 4 times a day. Immediately before inhalation, bronchoscopy sanitation was performed with local administration of 2 ml 2.4% euphyllinum for improving the penetration ability of drugs.

The next commonest complication involved overgrowth of granulation tissue in the area of the valve in 5 (6.5%) patients. The growth of granulation tissue in these patients was detected directly during removal of the valve, clinical manifestations were absent. Granulation tissue was removed endoscopically immediately after valve removal with histological examination. All cases of histological examination showed productive chronic inflammation with the formation of granulations.

In 3 (3.9%) patients the valve migrated into the bronchial tree. This complication was suspected in recovery of discharge air to drain and was confirmed by the chest X-ray examination. We detected the valve that had changed its location (this type of valve has the X-ray contrast element, which allows to identify it by X-ray). This complication was caused by a mismatch in valve size

and bronchus diameter after subsidence of bronchitis and edema of bronchial wall. Only one patient was found to have valve migration into the pleural cavity in partial resection of the lung in artificial respiration after increased oxygen pressure. This complication required re-installation of the valve taking into account new conditions and detailed information provided by intensive care physicians.

CONCLUSIONS

Thus, bronchial blockade is an effective and safe method in the treatment of patients with pyopneumothorax. Possible complications of its use are easy to diagnose and correct, but this method is not widely used and requires further study.

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