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ORIGINAL ARTICLE

Percutaneous transthoracic needle aspiration, lavage and instillation of clindamycin–gentamycin in peripheral pyogenic lung abscess

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KEYWORDS

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Abstract *Background:* Lung abscess are defined as localized suppurative necrotizing collection occurring within the pulmonary parenchyma. Some authors emphasized image-guided aspiration of lung abscess before antibiotics use in order to identify the pathogen. Antibiotic lavage is currently widely used in the treatment of patients with peritonitis, but not used previously in lung abscesses.

Aim of the study: Is to assess the role of percutaneous transthoracic needle aspiration, lavage and instillation of clindamycin–gentamycin on the treatment of peripheral pyogenic lung abscess.

Materials and methods: Twenty-six patients with peripheral pyogenic lung abscess are included in this study and classified into two groups. Group I received systemic empirical antibiotic, remodulated after the result of sputum culture and sensitivity. While group II underwent ultrasound guided percutaneous transthoracic needle aspiration, lavage and local instillation of antibiotics (clindamycin–gentamycin) associated with receiving systemic empirical parenteral antibiotics, that were remodulated after the result of aspiration culture and sensitivity. Chest X-ray and chest ultrasound were done pre, post and after intervention by one week and before discharge.

Results: There was a statistically significant difference between group I and II as regard duration of systemic antibiotic use, duration of hospital stay, duration of radiological improvement, and size of abscess after intervention. Moreover complications occurred in group I were higher than in

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group II. Succeeded patients (according to clinical and radiological improvement of lung abscess) were more obvious among group II than group I. Aspirates culture and sensitivity revealed gram negative bacteria and anaerobic microorganisms, which are sensitive to local instillation of antibiotics (clindamycin–gentamycin).

Conclusion: Percutaneous aspiration of peripheral lung abscess has an accurate determination of the causative organisms inside the abscess. The resolution of the abscesses clinically and radiologically was hastened by needle aspiration, lavage and instillation of clindamycin–gentamycin. Early intervention can improve symptoms, decrease morbidity and complications.

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Introduction

Primary lung abscess usually results from aspiration of anaerobic oropharyngeal bacteria into gravity-dependent portion of the lung. It is seen most commonly in alcoholics and in patients with altered consciousness, patients with gastroesophageal dysmotility, and those with poor dental hygiene [1].

Until the early 1940, surgical pneumotomy and drainage were the accepted treatment for lung abscess. Subsequent advances in anesthesia and surgical techniques lead to the advent of lung resection as the preferred therapy, until the availability of effective antibiotics rendered open drainage unnecessary in most patients [2].

Current first line therapy for lung abscess is antibiotic therapy directed at the likely causative organisms, usually anaerobic or mixed aerobic and anaerobic bacteria [3].

However still some patients display no radiologic evidence of improvement or show signs of persistent sepsis or develop complications like hemoptysis, bronchopleural fistula and empyema. Therefore, some authors emphasized external drainage via image guided drainage as a preferred method of treatment of pleural based abscesses [4].

Moreover, other authors stated the importance of image-guided aspiration of lung abscess before antibiotics use in order to identify the pathogen [5].

On the other hand antibiotic lavage is widely used in the treatment of patients with peritonitis [6]. But, not used previously in lung abscess. Lavage removes large quantities of toxins from a great absorptive area and many bacteria which should be death with body's defense mechanisms [7].

So, the aim of this study was to assess the role of percutaneous needle aspiration, lavage and instillation of clindamycin–gentamycin on the treatment of peripheral pyogenic lung abscess.

Materials and methods

This study was carried out in Chest, Cardiothoracic and Radiological Departments, Faculty of Medicine, Zagazig University in the period from January 2011 up to June 2013.

Subjects

This study included 26 cases with single peripheral pyogenic lung abscess classified into group I (13 cases) who received systemic empirical antibiotics started at first day of diagnosis which were remodulated after the result of sputum culture and sensitivity, and group II (13 cases) who underwent

ultrasound guided fine needle percutaneous transthoracic aspiration of the abscess in a single sitting and also received systemic empirical antibiotics started at first day of diagnosis. These empirical antibiotics were remodulated after the result of aspirates culture and sensitivity. Both groups were matched regarding their age, sex, site and size of the peripheral lung abscess.

All studied patients were submitted to:

1. Thorough medical history taking.
2. Full general and local examinations.
3. Laboratory investigations:
 - (a). Blood samples:
 - Complete blood count.
 - Liver function tests.
 - Kidney function tests.
 - Erythrocyte sedimentation rate.
 - Random blood sugar.
 - Coagulation profile (INR, PT, and PTT).
 - (b). Microbiology: Sputum and abscess aspirate were taken and send for bacteriological examination as following [8]:
 - I Z.N. stain was done for exclusion of tuberculosis.
 - II Gram stain smear was done for diagnosis of gram positive and negative bacteria.
 - III The specimens were cultured on blood agar and MacConkey agar aerobically and were inoculated into thioglycolate broth media anaerobically.
 - IV The bacterial isolates were identified by conventional methods and by Matrix-assisted laser desorption Ionization-Time of flight mass spectrometry (MALDI-TOF/MS).
 - V Antibiotic culture and sensitivity were done to bacterial isolates by the disk diffusion method.
4. Chest X-ray postero-anterior and lateral views before, after intervention and follow up after one week and before discharge.
5. Contrast enhanced conventional computed tomography: for detecting the site, size of abscess and to exclude obstructing foreign body or endobronchial neoplasms and for detecting complications such as empyema with bronchopleural fistula.
6. Chest ultrasonography was done by (GE, Logic III, expert) machine:
 - I Diagnostic chest ultrasound for both groups, to detect site, size of peripheral lung abscess and for follow up after one week and before discharge.
 - II Interventional chest ultrasound for group II: for guidance during the procedure Technique.

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