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OPINION REVIEW

- 10392** Regulating monocyte infiltration and differentiation: Providing new therapies for colorectal cancer patients with COVID-19
Bai L, Yang W, Qian L, Cui JW

REVIEW

- 10400** Role of circular RNAs in gastrointestinal tumors and drug resistance
Xi SJ, Cai WQ, Wang QQ, Peng XC

MINIREVIEWS

- 10418** Liver injury associated with acute pancreatitis: The current status of clinical evaluation and involved mechanisms
Liu W, Du JJ, Li ZH, Zhang XY, Zuo HD
- 10430** Association between celiac disease and vitiligo: A review of the literature
Zhang JZ, Abudoureyimu D, Wang M, Yu SR, Kang XJ
- 10438** Role of immune escape in different digestive tumours
Du XZ, Wen B, Liu L, Wei YT, Zhao K

ORIGINAL ARTICLE**Basic Study**

- 10451** Magnolol protects against acute gastrointestinal injury in sepsis by down-regulating regulated on activation, normal T-cell expressed and secreted
Mao SH, Feng DD, Wang X, Zhi YH, Lei S, Xing X, Jiang RL, Wu JN

Case Control Study

- 10464** Effect of Nephritis Rehabilitation Tablets combined with tacrolimus in treatment of idiopathic membranous nephropathy
Lv W, Wang MR, Zhang CZ, Sun XX, Yan ZZ, Hu XM, Wang TT

Retrospective Cohort Study

- 10472** Lamb's tripe extract and vitamin B₁₂ capsule plus celecoxib reverses intestinal metaplasia and atrophy: A retrospective cohort study
Wu SR, Liu J, Zhang LF, Wang N, Zhang LY, Wu Q, Liu JY, Shi YQ
- 10484** Clinical features and survival of patients with multiple primary malignancies
Wang XK, Zhou MH

Retrospective Study

- 10494** Thoracoscopic segmentectomy and lobectomy assisted by three-dimensional computed-tomography bronchography and angiography for the treatment of primary lung cancer
Wu YJ, Shi QT, Zhang Y, Wang YL
- 10507** Endoscopic ultrasound fine needle aspiration *vs* fine needle biopsy in solid lesions: A multi-center analysis
Moura DTH, McCarty TR, Jirapinyo P, Ribeiro IB, Farias GFA, Madruga-Neto AC, Ryou M, Thompson CC
- 10518** Resection of bilateral occipital lobe lesions during a single operation as a treatment for bilateral occipital lobe epilepsy
Lyu YE, Xu XF, Dai S, Feng M, Shen SP, Zhang GZ, Ju HY, Wang Y, Dong XB, Xu B
- 10530** Improving rehabilitation and quality of life after percutaneous transhepatic cholangiography drainage with a rapid rehabilitation model
Xia LL, Su T, Li Y, Mao JF, Zhang QH, Liu YY
- 10540** Combined lumbar muscle block and perioperative comprehensive patient-controlled intravenous analgesia with butorphanol in gynecological endoscopic surgery
Zhu RY, Xiang SQ, Chen DR
- 10549** Teicoplanin combined with conventional vancomycin therapy for the treatment of pulmonary methicillin-resistant *Staphylococcus aureus* and *Staphylococcus epidermidis* infections
Wu W, Liu M, Geng JJ, Wang M
- 10557** Application of narrative nursing in the families of children with biliary atresia: A retrospective study
Zhang LH, Meng HY, Wang R, Zhang YC, Sun J

Observational Study

- 10566** Comparative study for predictability of type 1 gastric variceal rebleeding after endoscopic variceal ligation: High-frequency intraluminal ultrasound study
Kim JH, Choe WH, Lee SY, Kwon SY, Sung IK, Park HS
- 10576** Effects of WeChat platform-based health management on health and self-management effectiveness of patients with severe chronic heart failure
Wang ZR, Zhou JW, Liu XP, Cai GJ, Zhang QH, Mao JF
- 10585** Early cardiopulmonary resuscitation on serum levels of myeloperoxidase, soluble ST2, and hypersensitive C-reactive protein in acute myocardial infarction patients
Hou M, Ren YP, Wang R, Lu LX

Prospective Study

- 10595** Remimazolam benzenesulfonate anesthesia effectiveness in cardiac surgery patients under general anesthesia
Tang F, Yi JM, Gong HY, Lu ZY, Chen J, Fang B, Chen C, Liu ZY

Randomized Clinical Trial

- 10604** Effects of lower body positive pressure treadmill on functional improvement in knee osteoarthritis: A randomized clinical trial study
Chen HX, Zhan YX, Ou HN, You YY, Li WY, Jiang SS, Zheng MF, Zhang LZ, Chen K, Chen QX

SYSTEMATIC REVIEWS

- 10616** Effects of hypoxia on bone metabolism and anemia in patients with chronic kidney disease
Kan C, Lu X, Zhang R

META-ANALYSIS

- 10626** Intracuff alkalinized lidocaine to prevent postoperative airway complications: A meta-analysis
Chen ZX, Shi Z, Wang B, Zhang Y

CASE REPORT

- 10638** Rarely fast progressive memory loss diagnosed as Creutzfeldt-Jakob disease: A case report
Xu YW, Wang JQ, Zhang W, Xu SC, Li YX
- 10645** Diagnosis, fetal risk and treatment of pemphigoid gestationis in pregnancy: A case report
Jiao HN, Ruan YP, Liu Y, Pan M, Zhong HP
- 10652** Histology transformation-mediated pathological atypism in small-cell lung cancer within the presence of chemotherapy: A case report
Ju Q, Wu YT, Zhang Y, Yang WH, Zhao CL, Zhang J
- 10659** Reversible congestive heart failure associated with hypocalcemia: A case report
Wang C, Dou LW, Wang TB, Guo Y
- 10666** Excimer laser coronary atherectomy for a severe calcified coronary ostium lesion: A case report
Hou FJ, Ma XT, Zhou YJ, Guan J
- 10671** Comprehensive management of malocclusion in maxillary fibrous dysplasia: A case report
Kaur H, Mohanty S, Kochhar GK, Iqbal S, Verma A, Bhasin R, Kochhar AS
- 10681** Intravascular papillary endothelial hyperplasia as a rare cause of cervicothoracic spinal cord compression: A case report
Gu HL, Zheng XQ, Zhan SQ, Chang YB
- 10689** Proximal true lumen collapse in a chronic type B aortic dissection patient: A case report
Zhang L, Guan WK, Wu HP, Li X, Lv KP, Zeng CL, Song HH, Ye QL
- 10696** Tigecycline sclerotherapy for recurrent pseudotumor in aseptic lymphocyte-dominant vasculitis-associated lesion after metal-on-metal total hip arthroplasty: A case report
Lin IH, Tsai CH

- 10702** Acute myocardial infarction induced by eosinophilic granulomatosis with polyangiitis: A case report
Jiang XD, Guo S, Zhang WM
- 10708** Aggressive natural killer cell leukemia with skin manifestation associated with hemophagocytic lymphohistiocytosis: A case report
Peng XH, Zhang LS, Li LJ, Guo XJ, Liu Y
- 10715** Chronic lymphocytic leukemia/small lymphocytic lymphoma complicated with skin Langerhans cell sarcoma: A case report
Li SY, Wang Y, Wang LH
- 10723** Severe mediastinitis and pericarditis after endobronchial ultrasound-guided transbronchial needle aspiration: A case report
Koh JS, Kim YJ, Kang DH, Lee JE, Lee SI
- 10728** Obturator hernia - a rare etiology of lateral thigh pain: A case report
Kim JY, Chang MC
- 10733** Tracheal tube misplacement in the thoracic cavity: A case report
Li KX, Luo YT, Zhou L, Huang JP, Liang P
- 10738** Peri-implant keratinized gingiva augmentation using xenogeneic collagen matrix and platelet-rich fibrin: A case report
Han CY, Wang DZ, Bai JF, Zhao LL, Song WZ

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Severe mediastinitis and pericarditis after endobronchial ultrasound-guided transbronchial needle aspiration: A case report

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Abstract

BACKGROUND

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a safe and minimally invasive diagnostic tool for mediastinal and hilum evaluation. However, infectious complications may occur after EBUS-TBNA. Among these, mediastinitis and pericarditis are rare.

CASE SUMMARY

A 67-year-old woman was referred to our hospital due to paratracheal lymph node enlargement on chest computed tomography (CT). EBUS-TBNA was performed on the lymph node lesions, and prophylactic oral antibiotics were administered. Seven days after EBUS-TBNA, the patient visited the emergency room with a high fever and chest pain. Laboratory test results revealed leukocytosis with a left shift and elevated C-reactive protein level (25.7 mg/dL). Chest CT revealed the formation of a mediastinal abscess in the right paratracheal lymph node and pericardial and bilateral pleural effusions. The patient received intravenous antibiotic treatment, cardiac drainage through pericardiocentesis, and surgical management. The patient recovered favorably and was discharged 31 d after the operation.

CONCLUSION

Mediastinitis and pericarditis after EBUS-TBNA are rare but should be considered even after the use of prophylactic antibiotics.

Key Words: Endoscopic ultrasound-guided fine needle aspiration; Complication; Mediastinitis; Pericarditis; Antibiotics; Case report

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Core Tip: Acute mediastinitis and pericarditis are rare complications of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). This case presented with acute mediastinitis and pericarditis that developed despite prophylactic antibiotic use after EBUS-TBNA and improved after antibiotic and surgical management.

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INTRODUCTION

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is used to biopsy enlarged lymph nodes in the mediastinum and hilum to stage patients with lung cancer and to provide a definitive diagnosis of lymphadenopathy. Although EBUS-TBNA is a safer and less invasive procedure than mediastinoscopy, severe complications can occur; A major complication rate of 0.3% was found in one meta-analysis[1]. Complications such as massive bleeding, cardiac tamponade, hemomediastinum, pneumomediastinum and pneumothorax have been reported as a complication of TBNA[1,2]. However, mediastinitis and pericarditis rarely occur after EBUS-TBNA. Here, we report the successful use of cardiac drainage and exploratory thoracotomy for drainage of a mediastinal abscess in a patient who developed acute severe mediastinitis with pericarditis after EBUS-TBNA.

CASE PRESENTATION

Chief complaints

The patient presented with a high fever and chest pain. Seven days after EBUS-TBNA, she visited the emergency room.

History of present illness

A 67-year-old woman was referred to our hospital because of lymph node enlargement on chest computed tomography (CT) (Figure 1). EBUS-TBNA of the right paratracheal lymph node was performed using a 22-gauge needle to obtain the tissue core. A total of 11 punctures were performed due to insufficient tissue cores. Prophylactic antibiotics (amoxicillin/clavulanate) were administered to prevent infectious complications after the procedure. Histological examination of the specimen revealed negative malignant cells and no bacteria.

History of past illness

The patient had no comorbidities.

Personal and family history

The patient and families were previously healthy.

Physical examination

On physical examination, the patient appeared acutely ill with a clear mental status. The patient was febrile (37.8°C) and had a stable blood pressure of 100/68 mmHg, pulse rate of 107 bpm, respiratory rate of 18/min, and body temperature of 37.8°C. The breath sounds on the left side of the chest were decreased.

Laboratory examinations

Laboratory tests revealed leukocytosis with a left shift and the following results: White blood cell count: 14410/mm³; neutrophils: 81.3%; hemoglobin: 9.8 g/dL; platelet count: 198000/mm³. Blood chemistry showed elevated total bilirubin (1.40 mg/dL), aspartate



Figure 1 Chest computed tomography before endobronchial ultrasound-guided transbronchial needle aspiration demonstrated enlargement of the right paratracheal lymph node.

aminotransferase (132 U/L), and alanine aminotransferase (137 U/L) levels in a normal renal panel. The cardiac enzyme level was normal, and the NT-proBNP level was slightly high (562.6 pg/mL). C-reactive protein level was elevated (25.7 mg/dL) and lactic acid level was within the normal range.

Imaging examinations

Chest radiography revealed left lung field haziness with pleural effusion and cardiomegaly (Figure 2). Emergency echocardiography revealed pericardial effusion of > 1 cm, and the blood pressure dropped (85/51 mmHg) after emergency echocardiography; cardiac drainage through the pericardiocentesis was performed. Chest CT showed a mediastinal abscess formation in the right paratracheal lymph node and pericardial and bilateral pleural effusions (Figure 2).

FINAL DIAGNOSIS

The final diagnosis in the present case was mediastinitis and pericarditis after EBUS-TBNA.

TREATMENT

Intravenous antibiotic treatment was initiated. Exploratory thoracotomy was performed by consulting the thoracic and cardiovascular surgery department. Surgical observation revealed whole lung adhesions, mediastinal abscesses, and effusions in the lymph node area. Surgery was completed after adhesiolysis, irrigation, and drainage.

Postoperatively, laboratory findings and the patient's general condition gradually improved. The cardiac drainage tube and chest drainage were removed 4 d and 16 d postoperatively, respectively (Figure 3). No bacterial pathogens were detected in the specimens obtained from the pericardial and abscess drainage.

OUTCOME AND FOLLOW-UP

The patient recovered favorably and was discharged 31 d after the operation. There was no evidence of recurrence within the 12 mo follow-up period.

DISCUSSION

Convex-probe EBUS-TBNA is a minimally invasive diagnostic technique for peritracheal and peribronchial areas[3]. EBUS-TBNA identifies the puncture site through real-time ultrasound guidance, allowing accurate sampling from lesions and cytological and histological diagnosis. The cumulative sensitivity of EUBS-TBNA is

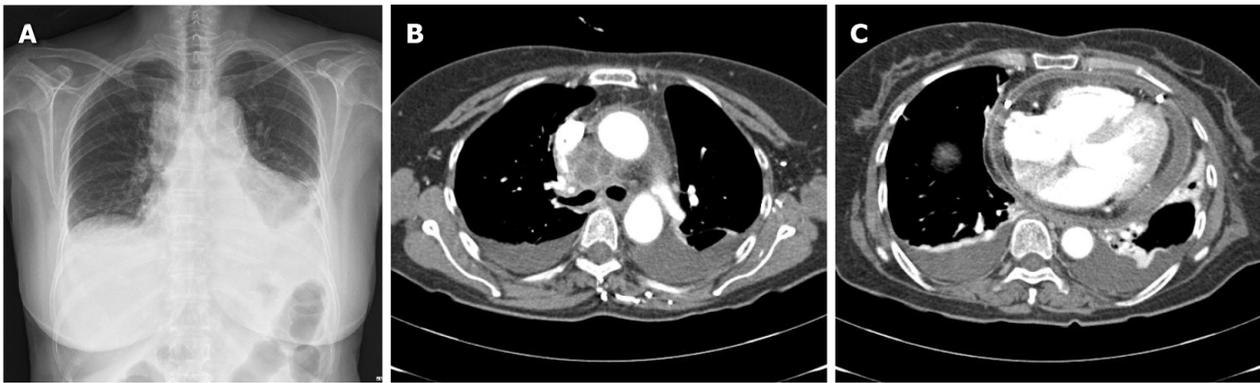


Figure 2 Chest X-ray radiograph and computed tomography. A: Chest X-ray radiograph showed both pleural effusion and cardiomegaly; B and C: Chest computed tomography performed 7 d after ultrasound-guided transbronchial needle aspiration demonstrated (B) an increased size and mediastinal abscess formation in the right paratracheal area and (C) newly developed moderate amounts of pericardial effusion with diffuse pericardial thickening.

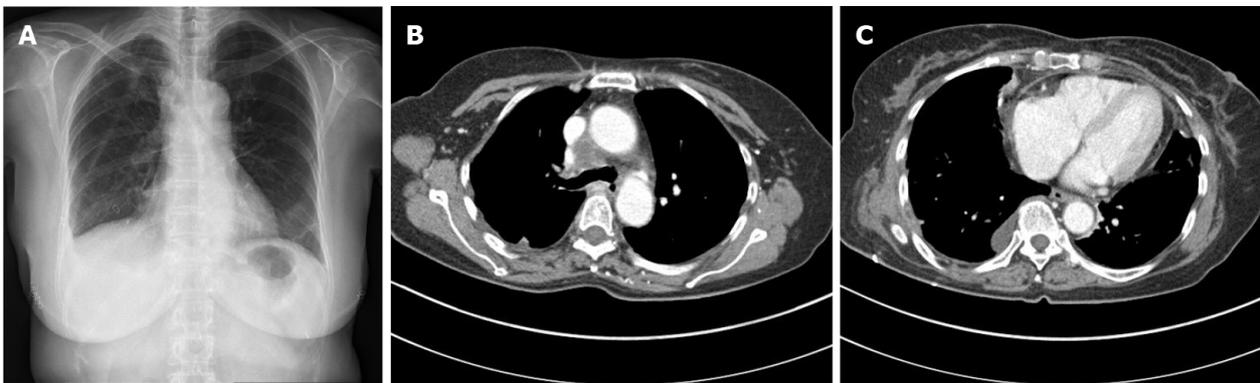


Figure 3 Chest X-ray radiograph and computed tomography. A: Chest X-ray radiograph findings improved after removal of the chest tube and drainage catheter; B and C: Chest computed tomography demonstrated (B) a decrease in size of the right paratracheal lymph node and (C) decreased amount of pericardial effusion and improvement in diffuse pericardial thickening.

88%-93% and the cumulative specificity is 100% in lymph node staging of lung cancer [4,5].

The overall major complication rate of this procedure was found to be 0.23%-1.23% in a previous meta-analysis[1,2]. Pneumothorax, hemothorax, and infections such as mediastinitis, pericarditis, and abscesses are reportedly caused by EBUS-TBNA[1,2]. In 7345 EBUS-TBNA cases in Japan, hemorrhage was the most frequent complication (0.68%), followed by infection (0.19%, mediastinitis, $n = 7$; pneumonia, $n = 4$; pericarditis, $n = 1$; cyst infection, $n = 1$) and pneumothorax (0.03%)[2]. As such, the probability of mediastinitis and pericarditis occurring as a complication of EBUS-TBNA is very low. In addition, case reports revealing the occurrence of mediastinitis or pericarditis after EBUS-TBNA are rare[6-12].

Antibiotic prophylaxis is not used in most EBUS-TBNA cases. However, in this case, mediastinitis and pericarditis occurred even with the use of prophylactic antibiotics. Antibacterial precautions are not recommended for routine diagnostic bronchoscopy, unless there is a previous history of spleen removal, artificial heart valves, or endocarditis[13]. This patient with an enlarged, homogeneous right paratracheal lymph node underwent diagnostic EBUS-TBNA with a 22-gauge needle to obtain the tissue core. A total of 11 punctures were performed because of insufficient tissue cores. Multiple needle passes would have caused mediastinitis and pericarditis in this patient. There are no definitive guidelines regarding which prophylactic antibiotics should be used and for which patients. Despite the use of amoxicillin/clavulanate in this patient, infectious complications occurred; therefore, further research is needed to determine the optimal antibiotic course.

In this case, the patient recovered with the help of antibiotics, pericardial drainage, and surgery. Mediastinitis, with a mortality rate of approximately 50%, is a life-threatening condition that requires aggressive treatment with both broad-spectrum antibiotics and surgical intervention[14]. Appropriate antibiotic therapy and

pericardial drainage may be helpful in treating infectious pericarditis. If vital signs are unstable, immediate pericardial drainage can help prevent pericardial tamponade in patients[15].

CONCLUSION

In conclusion, we reported a patient who developed mediastinitis and pericarditis as complications of EBUS-TBNA, even after the use of prophylactic antibiotics. Although EBUS-TBNA is a minimally invasive diagnostic and treatment option, the possibility of serious complications needs to be considered. Further research is needed to determine which type of prophylactic antibiotic should be used in at-risk patients.

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