Successful repair of a tuberculous bronchial lymphatic fistula with pericardial fat pad patch.

A case report

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Successful repair of a tuberculous bronchial lymphatic fistula with pericardial fat pad patch. A case report

This study reported a rare case of mediastinal abscess scrofula. The patient was found to have a large left main bronchial orificium fistula (approximately 1.5x1.5cm in size) after clearing a mediastinal lymph node abscess via the right thoracotomy approach. The adjacent tissue was empty and could not be directly repaired. Therefore, the research team cut out an appropriately sized right pericardial fat pad patch during the operation for repairing and then covered it with a biological patch (Neoveil) for reinforcement. The mediastinal pleura was treated by embedding and the postoperative recovery was good.

KEY WORDS: Abscess, Fistula, Pericardial fat patch, Tuberculous bronchial lymphatic, Tuberculosis bacillus, Type mediastinal lymphatic tuberculosis.

Introduction

Scrofula is a disease in which the human body is infected with mycobacterium tuberculosis which causes inflammation of the lymphatic system. It occurs in about a quarter of TB patients [1-3]. According to the different onset locations, scrofula can be divided into superficial lymphatic tuberculosis and deep lymphatic tuberculosis. It can be divided into four types of tuberculosis: nodular type, abscess type, sinus type and mixed type [4-6]. Mediastinal scrofula is a type of deep lymphatic tuberculosis. Patients with these types of abscesses face great risks due to surgical intervention, often because of the huge pressure of the abscess and the erosion of the adjacent trachea and bronchi to form the tracheobronchial fistula. At present, there are few clinical reports.

This study reported a clinical case with a large left main bronchial fistula (approximately 1.5x1.5cm in size) that could not be directly repaired because the adjacent tissue was empty after the right thoracotomy to remove the mediastinal lymph node abscess. During the operation, the right pericardial fat pad patch of appropriate size was taken for repairing and then covered with a biological patch (Neoveil) for reinforcement. The mediastinal pleura was treated by embedding and the postoperative recovery was good. Specific reports are as follows.

Materials and Methods

General Data

This study has been approved by the Ethics Committee of our hospital, and all patients have signed the Informed Consent Form. A 19-year-old male patient was admitted to our department on August 20, 2019, due to "finding a neck mass and having suffered from hoarseness for five months, aggravated with choking when drinking water for three days" with the impressions of "medi-

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astinal scrofula with abscess, bilateral cervical scrofula with abscess, fistula formation and hoarseness to be investigated."

Current Medical History

In March 2019, during a period of detention in a place in Henan province, the patient went to a local hospital for treatment due to a bilateral neck mass accompanied by hoarseness after catching a cold. A CT scan showed that "multiple lumpy soft tissue shadows were found in the superior mediastinum and bilateral neck".
Diagnosis: Lymphoma? It is suggested that the patient go to a higher level hospital for further treatment. On April 23, 2019, the patient went to a grade IIIA hospital in Sichuan province for treatment and underwent the left cervical lymph node biopsy. The postoperative pathological results showed necrotizing inflammatory exudation and granulomatous lesions.
Diagnosis: Scrofula. The patient returned to his hometown to take RHEZ for anti-tuberculosis treatment on April 24, 2019. By July 5, 2019, his liver function was reviewed in a local hospital and the results revealed abnormal liver function, which was diagnosed as a drug-induced liver injury. Therefore, the drug was withdrawn. The patient came to our hospital for treatment on July 24, 2019 and was admitted to the Internal Medicine department 1.3 for an auxiliary examination.
Related physical result: ALT 66U/L, AST 108U/L, GGT 66.1U/l, D-Diner 1.76 ug/mI, DBIL 10.3umol/l, CRP 64.9mg/l, HS-CRP 8.87mg/l, ASO 462.1IU/l. The liver function returned to normal after the patient was treated with INH + RFP + EMB + levofloxacin hydrochloride and undergoing liver-protecting therapy for one week. Because of the neck abscess sinus and hoarseness, the patient was transferred to our department on July 29, 2019.

Physical Examination

Physical examination on admission: T36.5C; P80 beats/min R20 beats/min Bp107/67mmHg. Multiple bulging masses were found in the bilateral neck. The lymph nodes in each part of the neck were enlarged, and the largest mass was about 3×4×3 cm^3 in size. Two orificium fistulas were seen in the zone IV of the left neck, approximately 2×2 and 1×1 cm in diameter. Annular blackened skin was seen around, approximately 2 cm in diameter.

Clinical Diagnosis

The patient was admitted to the hospital and diagnosed with: Mediastinal scrofula with abscess, laryngeal nerve involvement, bronchial lymphatic fistula, and bilateral cervical scrofula.

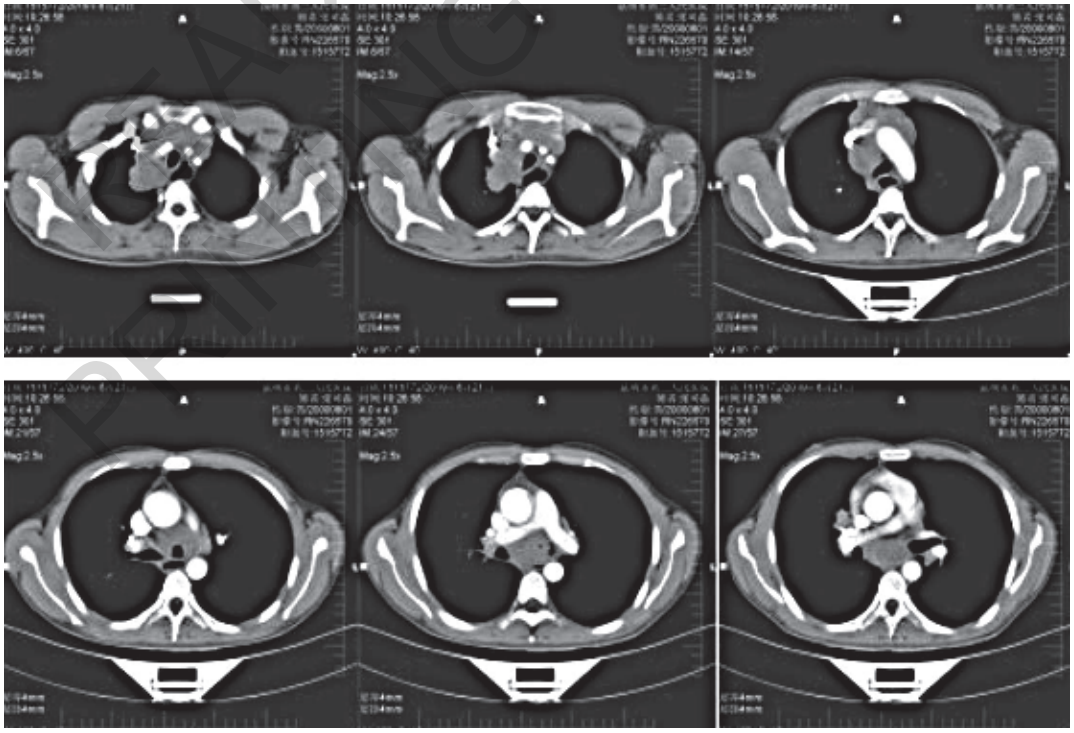

Fig. 1: Preoperative MRI.

Result

Receiving Relevant Examinations After Admission

The MRI on August 1, 2019, suggested that: 1. multiple lymph nodes were seen in the bilateral neck and the mediastinum, with partial fusion, which was considered as scrofula; 2. abnormal signals were discovered in the aryepiglottic fold and vocalis, which were suspected infective lesions. It is suggested to combine with clinical analysis (Fig. 1). The tracheoscopy on August 2, 2019, showed: 1. mild external compression stenosis in the middle and lower segment of the trachea; 2. lymph leakage in the right upper lobe and left main bronchus; 3. external compression stenosis in the middle segment of left main bronchus; 4. Vocal cord paralysis (Fig. 2). The Alveolar lavage fluid test showed that the Mycobacterium tuberculosis DNA was negative (+). The preoperative CT examination on August 21, 2019, suggested that the group 2, 3, 4, 5, 6, 7 and 8 mediastinal lymph nodes were enlarged with liquefied necrosis. During hospitalization, the patient had aggravated hoarseness with choking when drinking water.

Operation Treatment

The patient underwent the right thoracotomy under general anesthesia on August 24, 2019. During the operation, a lymph node in the right superior vena cava, paratracheal lymph nodes, azygos arch lymph nodes, lymph nodes below the protuberantia and para-esophageal lymph nodes were widely enlarged with the liquefied abscess. The lymph nodes and abscess were completely removed under blunt dissection after cutting open the mediastinal pleura with an electric knife. A defect was found in the left main bronchial membrane after removing the mediastinal lymph node abscess, which was consistent with the site of the orificium fistula found in the tracheoscopy. However, the orificium fistula was larger (approximately 1.5*1.5cm in size) than that in the tracheoscopy. The adjacent tissue was empty and could not be repaired directly. Therefore, an appropriately sized right pericardial fat pad was taken during the operation for repairing, and then covered with a biological patch (Neoveil) for reinforcement. The mediastinal pleura was treated through embedding (Fig. 3).

Fig. 2: Preoperative tracheoscopy.

Fig. 3: Intraoperative.

Postoperative Follow-Up

The symptom of choking when drinking water disappeared three days after the operation and the hoarseness disappeared one week later. The patient was reviewed by CT scan two weeks after the operation, and the results showed that the mediastinal lesions basically disappeared, and no signs of hydropneumothorax and mediastinal effusion and pneumomediastinum were found. The patient had a return visit for a follow up after eight weeks. The neck mass was obviously reduced, and the subjective symptoms had basically disappeared. No abnormal lesions (Fig. 4) were found when reviewing the CT scan. A little necrotic tissue was found in the left main bronchus orificium fistula when reviewing the bronchoscopy, and no stenosis and deformation were discovered (Fig. 5).

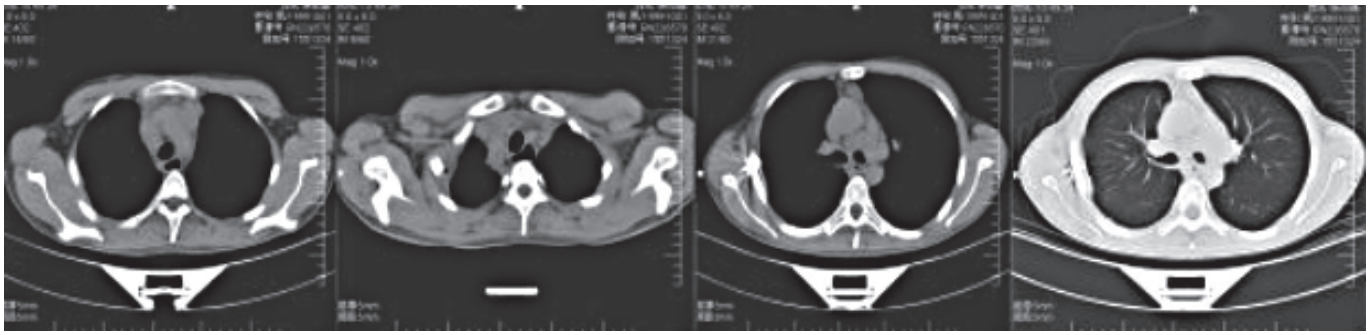

Fig. 4: Postoperative MRI.

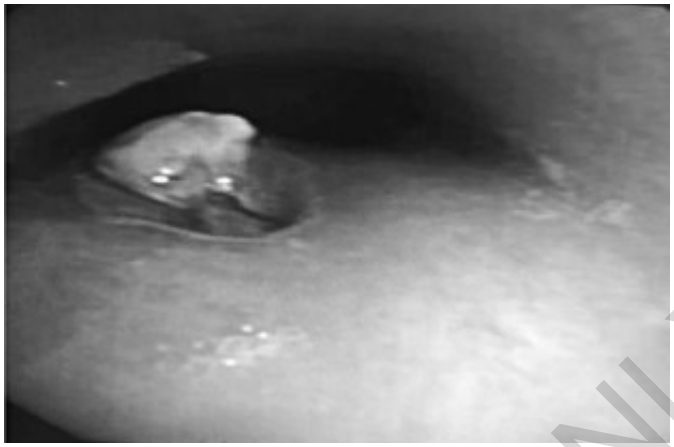

Fig. 5

Discussion

The study reported a rare case of mediastinal abscess scrofula. The patient found a large left main bronchial orificium fistula (approximately 1.5*1.5cm in size) after clearing the mediastinal lymph node abscess via the right thoracotomy approach. The adjacent tissue was empty and could not be directly repaired. The research team cut out an appropriately sized right pericardial fat pad patch during the operation and then covered it with a biological patch (Neoveil) for reinforcement. The mediastinal pleura was treated through embedding and the postoperative recovery was good.

Mediastinal scrofula is a type of adult tuberculosis or primary syndrome, which is often accompanied by cervical lymph node enlargement. However, it causes hoarseness or choking when drinking water because it rarely erodes the recurrent laryngeal nerve, which makes the disease easily misdiagnosed [7-9]. The tracheal and bronchial lymphatic fistula caused by the erosion of the airway by mediastinal scrofula is usually treated by means of mainly endotracheal endoscopic electric burning, laser, freezing and other methods to cut open the intratracheal leakage for the drainage of pus and necrotic cheese. However, it is easy to cause risks of the intraductal spread of lesions, and suffocation caused by a blockage of the airway, but it is only limited to the relatively isolated tuberculosis abscess of the trachea and bronchus. As is the same in this case, patients with bilateral pulmonary hilar and mediastinal extensive swelling and liquefaction can only avoid further complications through surgical intervention, and the only hope they have of curing the disease is by strong anti-tuberculosis treatment. However, the complications of tracheal, bronchopleural, mediastinal fistulas easily occur after the mediastinal pleura incision. Therefore, a sufficient plan should be made before the operation, such as the preoperative preparation of the tectorial membrane and bronchial stent placement, etc. However, several adverse conditions can easily occur after the stent placement, such as ischemia and necrosis due to airway wall compression, difficulty in removing after the operation, etc. [10-14]. In the past, it was not uncommon to use the body tissue as a patch for surgical treatment, but it is rarely used in the repair of the airway orificium fistula [15-18]. This study has applied the appropriate body tissue which is flexibly cut out as a patch to repair airway orificium fistula in order to isolate the open airway and promote the repair of the surgical site, which provides a new and convenient clinical operation method for surgical treatment of this kind [15-18]. Of course, because it is a single case, the observation time is still short, its reliability and safety need to be further observed and studied. However, according to the actual operation, a flexible, simple, safe, practical approach was used to treat the patient. This case can provide us with a good reference.

Experiences and lessons: The mediastinal scrofula complicated with tracheobronchial fistula is a contraindication in the surgical treatment. Because it is easy to have a tracheotracheal or bronchopleural fistula after removing the lesion by a thoracotomy approach, it usually causes a series of serious consequences. Therefore, endoscopists usually use a tracheoscopic incision to remove the granulation tissue of the endotracheal orificium fistula to promote the drainage of pus or long-term oral administration of anti-tuberculosis drugs. It takes a long time to treat the disease through the self-absorption mechanism of the patient, and the patient endures the pain for a long time, and sometimes it is easy to cause suffocation or spread the disease in the airway due to

the influx of a large amount of pyogenic necrosis. Through the treatment of this patient, it has provided us with a new way to treat these kinds of cases.
There are still the following shortcomings in this study. First of all, the present study is a case report study, and there is no control group. Therefore, there is still a certain risk of bias. Secondly, this study is the sample size is small, thus, it is still necessary to further increase the sample size and carry out multicenter clinical research. Finally, the clinical follow-up time of the current study is short, and further follow-up is needed to observe the prognosis of the patient.

Conclusion

Repair of tuberculous bronchial lymphatic fistula with pericardial fat pad patch.

Riassunto

Gli autori riportano un raro caso di un ascesso mediastinico di natura tubercolare. Durante l'intervento eseguito per toracotomica destra gli autori hanno riscontrato la presenza di una fistola di considerevoli dimensioni del bronco principale sinistro (circa 1,5 x 1,5 cm di dimensione). Il tessuto circostante non era utile alla chiusura della fistola ed il difetto non poteva essere riparato direttamente. Pertanto nel corso dell'intervento per riparare la fistola è stato usato un patch dal pericardio destro con tessuto adiposo circostante di dimensioni adeguate che poi è stato ricoperto con un tessuto biologico (Neoveil) di rinforzo. La pleura mediastinica è stata inoltre anch'essa incorporata ed il recupero clinico è stato buono.

Acknowledgements

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Commento e Commentary

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Università di Catania

The interesting article of Jin-Tang He et al. on surgical repair of a tuberculous bronchial lymphatic fistula permits to discuss and answer on two important questions that immediately arise in my mind.
The first, the fact that the authors decided to start the operation by a formal thoracotomy instead of a VATS procedure is certainly questionable in the modern era. In fact many surgeons nowdays could probably have started the procedure by uniportal or multiportal VATS and only if the operation was technically difficult, the decision to open the chest could have been taken [1,2].
The second, the 1.5 cm defect on the left main bronchus, which could have been formed because the extensive mediastinal lymphonode dissection, has been closed with perdicardial tissue as there was no tissue available to close the fistula. The use of pericardial fat to close tracheal and bronchial defects is not new [3], and success has been obtained in various experiences. Nevertheless, although some authors could have preferred a long intercostal muscle flap to repair the left bronchial defect [4,5]. I agree with the authors as the operation using pericardium/pericardial fat is faster and require less operative anatomical dissection. The intraoperative authors' decision making was successful, and therefore they must be congratulated for the excellent result obtained in this challenging patient.
In the life of a surgeon, prompt and correct intraoperative decision making is an important determining factor for the benefit of our patients.

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Answers of the Authors to Dr Migliore Comments.

As you mentioned, vascularized intercostal muscle flap may have the ability to repair bronchial fistulas. Skin flap transplantation is one of the basic methods used in plastic surgery to repair tissue defects and reconstruct organs and functions. However, whether it is a simple random skin flap or a free skin flap with high requirements for microsurgery technology, during its formation, the skin flap undergoes an ischemia-reperfusion process due to the destruction of the strict regulation of normal tissues on blood balance. This process often causes skin flap necrosis. In this case, we used appropriately sized right pericardial fat pad patch and biological patch (Neoveil) to repair the fistula. These tissues are relatively simple and safe for this patient, and there is no risk of ischemia and reperfusion. Although we discussed a variety of tissue materials for repair at the time, we finally chose the safe and easily accessible right pericardial fat pad patch, which poses the lowest risk to the patient. Thank you very much for your recommendation, and we will also consider the feasibility of flap transplantation in fistula repair in the future study.

According to the patient's condition at the time, we considered removing mediastinal lymph node abscess through right thoracotomy. To our surprise, a large left main bronchial fistula was discovered during the operation, and the adjacent tissue was empty, which cannot be repaired directly. Then we used an appropriate size right pericardial fat pad for repair, and then covered it with a biopatch (Neoveil) for reinforcement. As you recommend, thoracoscopic interventional surgery should be used for surgery and exploration of diseased tissue. We will improve these in future research.

We will conduct long-term follow-up and evaluation of patients' recovery. We also hope that the results of this study can provide a safe and stable tissue selection reference for bronchial fistula repair.