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A case of necrotizing mediastinitis induced by acute pyopericardium

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ABSTRACT

Deep neck infection is a potentially life-threatening disease, especially complicated with descending necrotizing mediastinitis (DNM). The mean age of DNM is 49–57.8 years old. The commonly seen causes are tonsillar, pharyngeal infection and odontogenic origins. When the deep neck infection extended to the mediastinal spaces, the pleural effusion or pericardial effusion may appear. Here is a rare young lady who had fever and sore throat for 2 weeks, and chest X-ray showed bilateral pleural effusion. After surgical drainage, the *Escherichia coli* grew over the culture of pericardial effusion. This case is rarely seen in the presence of *Escherichia coli* pyopericardium originating from DNM in the past. Overall mortality rate of DNM is around 11.2%–17% nowadays. We should keep in mind that for DNM, early diagnosis and aggressively surgical intervention with suitable drainage, and intensive postoperative care should be conducted to lower the morbidity and mortality.

1. Introduction

The majority of deep neck infections (DNI) are caused by infections of superficial structures such as tonsil or pharynx, and early diagnose is difficult. There are some dangerous complications of DNI including airway obstruction, jugular vein thrombosis, descending necrotizing mediastinitis (DNM), sepsis, and disseminated intravascular coagulopathy. DNM is one of the life-threatening conditions originating from the complication of deep neck infection. Here, a rare case of a lady who got a DNM with *Escherichia coli* (*E. coli*) pyopericardium leading to cardiac tamponade was presented. Early and appropriately aggressive surgical drainage saved her life.

2. Case report

A 37-year-old lady just arrived in Taiwan from Indonesia with fever and sore throat for 2 weeks. In Indonesia, retropharyngeal abscess was diagnosed. Her body temperature was 39 °C and heart rate was 116 beats/min. She was of tachypnea (20 breaths/min) and blood pressure was taken as 116/68. Swelling and erythematous pharyngeal wall and decreased left lung breathing sound were found by physical examinations. Results of blood tests showed 19400/μL white blood cell, 83% segment, 137 mg/dL glucose, 182 IU/L glutamic oxaloacetic transaminase, 124 meq/L Na and 2.6 meq/L K. Urine analysis showed 2+ of proteinuria and others were unremarkable. Chest X-ray (CXR) showed massive left side pleural effusion (Figure 1).

Pleurocentesis was performed and found yellowish and turbid pleural effusion with red blood cell of 2255/μL, white blood cell of 360/μL (lymphocyte: neutrophil: other = 15:80:5) and Rivalta test was positive. For further evaluation of DNI, CT of neck and chest were performed. Pus with gas-forming effusion over the deep neck space extension to the mediastinal space

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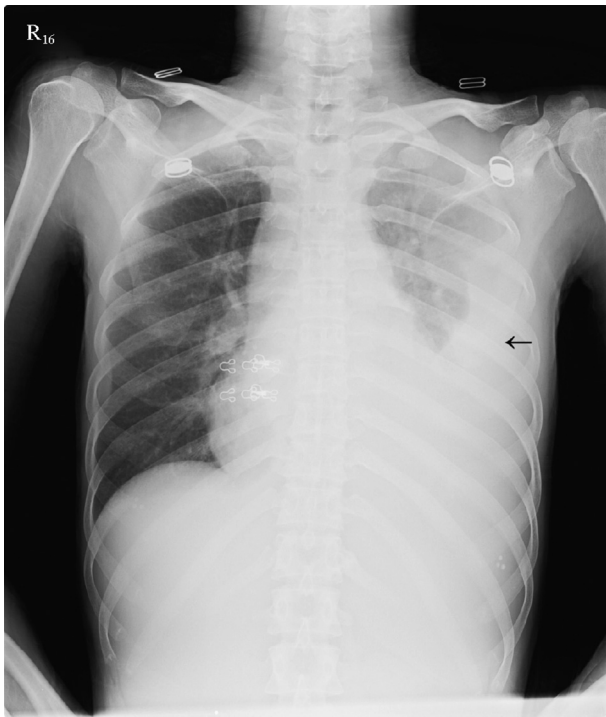


Figure 1. CXR showed left side massive pleural effusion (black arrow key) and increased cardio thoracic ratio.

and suggestive DNM was found (Figure 2A). Otherwise, massive pericardial effusions with bilateral pleural effusions, left lung atelectasis were also noted (Figure 2B). Emergent thoracoscopy and mediastinotomy with mediastinal drainage, pleural debridement, pericardiectomy and chest tube drainage were performed and 300 mL of pericardial effusion and 800 mL turbid pleural effusion were drained out. *E. coli* was isolated in the culture of pericardial effusion postoperative Day 5. All acid-fast stain and culture were negative. She was recovered and discharged postoperative Day 20 with 1 week of surgery intensive care unit and 13-day ward care.

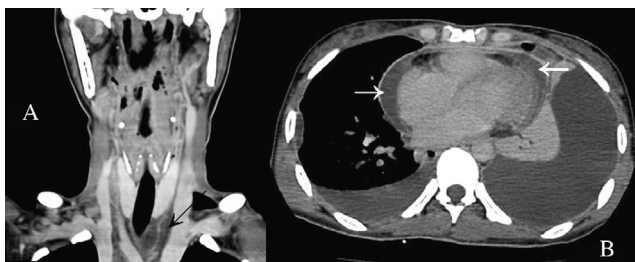


Figure 2. A: Pus and air bubble (the black arrow key) seen in the CT of neck suggesting a deep neck infection; B: Chest CT shown massive pericardial effusion (the white arrow keys) and bilateral pleural effusions with left lung atelectasis.

3. Discussion

DNM is a devastating complication of DNI. It spreads along the cervical fascial planes into the mediastinal spaces leading to pleural effusions, pericardial effusion, pyopericardium and cardiac tamponade. The mean age of DNM was around 49–57.8 years old^[1–3]. Pleural effusion and pericardial

effusion all are the clues and warning signs of DNI extension to mediastinal spaces.

Staphylococcus aureus and *Streptococcus* spp. are the most commonly seen pathogens led to DNI^[4]. *Klebsiella pneumoniae* uniquely accounts for the most important causative pathogen for diabetic patients with DNM^[3]. In this case, *E. coli* is rarely seen solely but mixed microorganisms in the DNI in the past articles. Empiric antibiotic administration should cover aerobes and anaerobes for possible mixed infection. In our case, we administered 500 mg flomoxef sodium every 8 h intravenous for the postoperative care.

The CT of cervico-thorax is the ideal image to evaluate the area of DNM involved^[5]. It can detect the small amount of air in the mediastinal space, so-called the mediastinal emphysema. Early detection of necrotizing fasciitis with CT enables aggressive surgical treatment. CT may also be a wise guide in initial surgical debridement and vital for detection and follow up^[6]. Owing to the presentation as acute chest pain with pyopericardium mimicking pericarditis, CT plays an important role to make accurate diagnosis^[7]. If the mediastinitis is overwhelming in bilateral pleural cavities and mediastinal spaces, clamshell approach thoracotomy is favorable to perform decortication and debridement of mediastinal spaces, even pericardiectomy.

The thoracic approach and the side of the thoracotomy depended on the involved side of pleural effusion and mediastinal spaces. For patients with involvement of the anterior lower mediastinum, an additional subxiphoid approach is suggested^[3]. In UK, there is a case reported successfully conservative treatment as intravenous antibiotics and intercostal drainage^[8]. In our case, cervical approach mediastinotomy, thoracoscopy decortication and pericardiectomy are suitable to debride and drain bilateral pleural effusions, pericardial effusion, and inflammatory debris over the mediastinal spaces.

DNM maybe resulted from complications of oropharyngeal infection, dental and Ludwig's angina^[6,8,9]. Although early and aggressive surgical intervention is possible, there is still 11.2%–17% of mortality in DNM^[3,4,10]. When the CXR shows pleural effusion or pericardial effusion in the deep neck infection patients, further study of neck and chest CT is mandatory to early detect the horrible DNM. In the pathogen, besides gas-forming *E. coli* in this case, *Klebsiella pneumoniae* is another one commonly seen to result in DNM^[11].

DNM needs early diagnosis, aggressive surgical intervention with suitable drainage, and intensive postoperative care to lower the morbidity and mortality. For patients who had DNI with pleural effusion or pericardial effusion, further CT study to exclude the DNM is mandatory to save their lives.

Conflict of interest statement

The authors report no conflict of interest.

References

- [1] Singhal P, Kejriwal N, Lin Z, Tsutsui R, Ullal R. Optimal surgical management of descending necrotising mediastinitis: our experience and review of literature. *Heart Lung Circ* 2008; **17**(2): 124-8.
- [2] Mihos P, Potaris K, Gakidis I, Papadakis D, Rallis G. Management of descending necrotizing mediastinitis. *J Oral Maxillofac Surg* 2004; **62**(8): 966-72.
- [3] Chen KC, Chen JS, Kuo SW, Huang PM, Hsu HH, Lee JM, et al. Descending necrotizing mediastinitis: a 10-year surgical experience

- in a single institution. *J Thorac Cardiovasc Surg* 2008; **136**(1): 191-8.
- [4] Suehara AB, Gonçalves AJ, Alcadipani FA, Kavabata NK, Menezes MB. Deep neck infection: analysis of 80 cases. *Braz J Otorhinolaryngol* 2008; **74**(2): 253-9.
- [5] Novellas S, Kechabtia K, Chevallier P, Sedat J, Bruneton JN. Descending necrotizing mediastinitis: a rare pathology to keep in mind. *Clin Imaging* 2005; **29**(2): 138-40.
- [6] Elsayh TG, Alotair HA, Alzeer AH, Al-Nassar SA. Descending necrotizing mediastinitis. *Saudi Med J* 2014; **35**(9): 1123-6.
- [7] Cho YS, Choi JH. Descending necrotizing mediastinitis with diffuse ST elevation mimicking pericarditis: a case report. *J Emerg Med* 2014; **47**(4): 408-11.
- [8] Iyer S, Collum J, Babores M. Descending necrotizing mediastinitis: a conservative approach. *Ear Nose Throat J* 2014; **93**(3): E11-4.
- [9] Dajer-Fadel WL, Borrego-Borrego R, Flores-Calderón O, Argüero-Sánchez R, Navarro-Reynoso FP, Ibarra-Pérez C. Descending necrotizing mediastinitis associated with spinal cord abscess. *Asian Cardiovasc Thorac Ann* 2013; **21**(1): 90-2.
- [10] Ishinaga H, Otsu K, Sakaida H, Miyamura T, Nakamura S, Kitano M, et al. Descending necrotizing mediastinitis from deep neck infection. *Eur Arch Otorhinolaryngol* 2013; **270**(4): 1463-6.
- [11] Thomas AJ, Mong S, Golub JS, Meyer TK. *Klebsiella pneumoniae* cervical necrotizing fasciitis originating as an abscess. *Am J Otolaryngol* 2012; **33**(6): 764-6.