

Outcome of surgery of necrotising pneumonia in immunocompromised patients: HKL experience

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SUMMARY

Necrotising pneumonia or lung gangrene is a challenging problem and it is diagnosed more often today, especially in tertiary hospitals. It is always a challenge to treat these patients as they are usually immunocompromised and are often ill when the diagnosis is made. We report three immunocompromised patients with necrotising pneumonia who were treated surgically. We share the outcomes of these patients and discuss the management of necrotising pneumonia in the immunocompromised.

INTRODUCTION

Necrotising pneumonia is a severe form of community acquired pneumonia. It is characterised radiographically by findings of consolidated lung with peripheral necrosis and multiple small cavities, and it may be rapidly progressive. If it is not addressed and treated promptly, it leads to pulmonary gangrene. Pulmonary gangrene is the final stage in a continuum of progressive devitalisation of pulmonary parenchyma and is characterised by sloughing of a pulmonary segment or lobe.

With current advancement of medicine, the spectrum of immunocompromised hosts has expanded with prolonged survival for solid organ and haematopoietic cell transplant recipients, patients with immune deficiencies (including congenital disorders and HIV/AIDS), and autoimmune disorders, as well as the development of novel cancer therapies including immunotherapies and checkpoint inhibitors. This rapid progress has given rise to a diverse set of immune deficits that create a substrate for opportunistic infections.

Severe forms of pneumonia ranging from lung abscess to necrotising pneumonia and even lung gangrene is on the rise and we would like to share our experience with a series of three cases of necrotising pneumonia which we have operated in 2017.

CASE REPORT

Our first case is a 47-year-old Malay woman who is a renal transplant recipient in January and was on immunosuppressants. She was diagnosed with sepsis secondary to pneumonia and was referred to our unit after Computerised Tomography (CT) thorax revealed left lung upper lobe gangrene (Fig 1a,1b). We performed a left

thoracotomy and upper lobectomy with latissimus dorsi (LD) flap stump coverage in August. Her Histopathological Examination (HPE) report was consistent with necrotising pneumonia. Post operatively, her immunosuppression worsened with Absolute Neutrophil Counts (ANC) going down to less than 1.0. Despite covering the bronchial stump with LD flap, it dehiscid. Patient succumbed on Day-18 of surgery.

Our second case is a 19-year-old Malay man. He was two weeks post traumatic splenectomy, who developed Overwhelming Post Splenectomy Infection (OPSI) and was referred after CT thorax revealed left lower lobe necrotising pneumonia. (Fig 1c,1d). He underwent a left thoracotomy and lower lobectomy in October. HPE was consistent with necrotising pneumonia. His post-operative recovery was smooth, and he was discharged well.

Our third case is a 24-year-old, Malay man with underlying RVD and Hepatitis B. He was admitted for pneumonia and subsequently became more septic. CT Thorax revealed a right middle lobe abscess. His CD4 count was 4 cells/mm³. (Fig 2). In November, he underwent right thoracotomy and middle lobectomy for middle lobe lung abscess. His HPE showed lung gangrene. Patient was discharged well and is now on HAART and under follow up.

DISCUSSION

Necrotising pneumonia, lung abscess, or pulmonary gangrene is often associated with risk factors resulting due to immunodeficiency.¹ Chronic alcoholism, chronic respiratory disease, diabetes mellitus, malnutrition, and conditions associated with an elevated risk of aspiration like seizure disorders or proximal foregut carcinomas are most common.¹

In the first decades of the 20th century acute putrid lung abscess was still a crushing condition and out-come mostly fatal.¹ Surgical removal of the foci of infection, as performed in all our three cases, has been regularly performed since the early 21st century and has shown to have good outcome.²

Patients who are immunocompromised, be it from any cause, has been proven to show good outcomes after the source or foci of thoracic infection is removed. Previous study in the University of Minnesota by Salerno et al., showed surgical resection of the invasive pulmonary aspergilosis focus, in conjunction with appropriate antifungal therapy, cleared the

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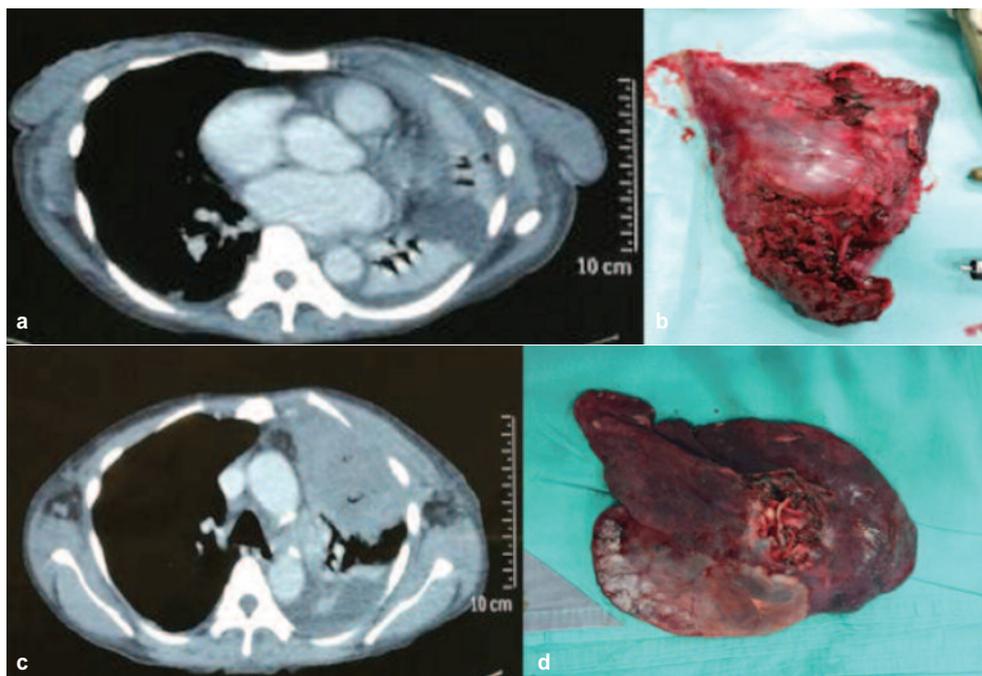


Fig. 1: a. CT Thorax of the first case.
 b. Gross specimen of resected lung tissue of first case.
 c. CT Thorax of second case.
 d. Gross specimen of resected lung tissue of second case.

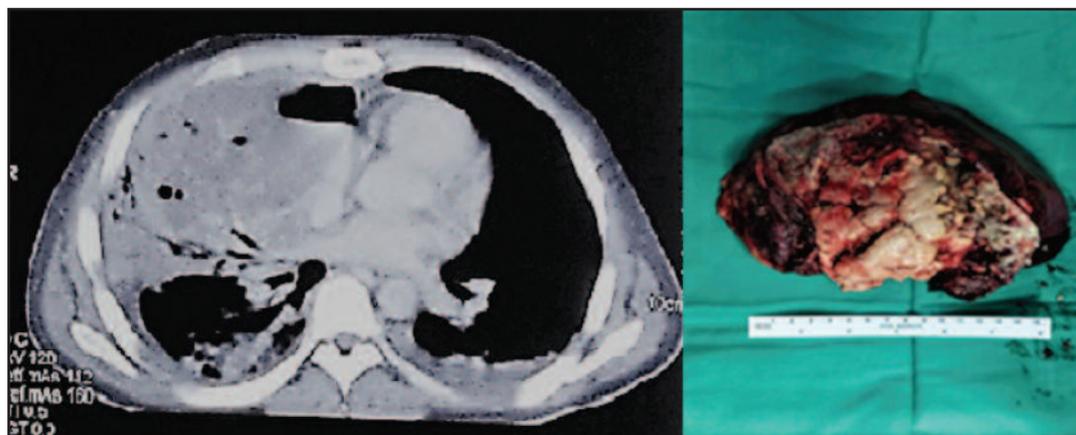


Fig. 2: CT Thorax and gross specimen of resected lung tissue of third case.

infection in 69% of patients in their centre, all of whom who are immunocompromised by haematological disorders. Peripheral lesions were easily removed by wedge resection, whereas larger or more central lesions were removed by lobectomy.³

For HIV positive patients, effective nucleoside anti-retroviral agents and protease inhibitors have improved dramatically the outlook of HIV-infected patients and altered completely the nature of the surgical care that these patients require. In our 3rd case, the patient was already on antiretroviral therapy and despite having a low CD4 count, he showed good outcome after surgical removal of the infected foci.

For renal transplant patients, the most common time for pneumonia or lung infection to set in is in the first few weeks. During the initial month, infections tend to be secondary to bacterial pathogens acquired in the hospital and intensive care unit. From the first to sixth months post-transplant, patients are exposed to sustained levels of augmented immunosuppression leading to the appearance of opportunistic pathogens. After six months, immunosuppression is typically decreased and infections with community acquired pathogens become more common.⁴ In our case, the severe pneumonia started setting in around 6-7 months post-transplant which could due to both augmented immunosuppression and community

acquired pathogens. However, her low ANC counts favours the former, however the outcome of the surgery was unfavourable because of overwhelming infection and severe immunosuppression.

There are few publications on lung abscess developing because of Overwhelming Post Splenectomy Infection (OPSI). In our cases, severe OPSI was the cause of the deterioration and worsening sepsis and the lung abscess was found to be the source which eventually required resection. However, post splenectomy patients are known to be immunocompromised and are more vulnerable to infections and severe lung infection can be one of them. Sersar and colleagues found in their series of post splenectomy patients complicated with left lower lobe bronchiectasis, patients responded well to treatment after undergoing a left lower lobectomy.⁵

CONCLUSION

The three cases discussed above shows that surgery is a viable option in a selected group of patients. These cases are better managed in a centre with availability of various expertise involving thoracic surgery, infectious disease team and intensive care. Multidisciplinary team effort is very important in the perioperative preparation of these patients prior to surgery.

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