

**PURULENT PERICARDIAL EFFUSION SECONDARY TO DIABETIC FOOT CAUSED  
BY KLEBSIELLA PNEUMONIAE: A RARE CASE REPORT**Amit Kumar<sup>1\*</sup>, Paramjot Kaur<sup>2</sup>, Megha Chauhan<sup>3</sup>, Satish Kumar<sup>4</sup>, Himanshu Dhiman<sup>5</sup> and Balbir Singh  
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**ABSTRACT**

A 42-year-old man with a history of diabetes mellitus with diabetic foot from 5 days presented at our emergency room with chest pain and dyspnea. A chest X-ray revealed a pericardial effusion which was confirmed by echocardiography. Debridement of foot & pericardiocentesis was performed; strains of *Klebsiella pneumoniae* were detected on culture of the pus and pericardial aspirate. Therefore, purulent pericarditis was diagnosed secondary to haematogenous spread from foot abscess. Patient was treated with broad spectrum antibiotics and regular pericardial aspiration was done by pigtail. We report an extremely rare case of purulent pericarditis caused by a haematogenous spread of *Klebsiella pneumoniae* with primary focus being diabetic foot.

**INTRODUCTION**

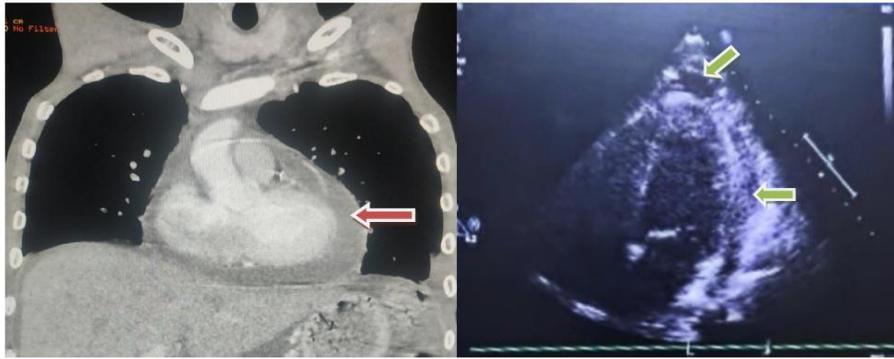
Purulent pericardial effusion is a rapidly fatal disease if left untreated. Owing to its rarity, its incidence and prevalence is still not described and many cases are diagnosed posthumously. Possible mechanisms are described as contiguous spread from an intra-thoracic site, hematogenous spread, extension from a myocardial site, perforating injury or surgical extension from a sub diaphragmatic site.<sup>[1]</sup>

In retrospective literature reviews, the possible sources of pericardial effusion were identified in pneumonia, empyema and trauma to chest. The most common microorganisms were *Streptococci*, *Pneumococci* and *Staphylococci*.<sup>[2]</sup> Rare cases describing purulent pericardial effusion secondary to liver abscess have been reported.<sup>[3]</sup> However, in the reviewed literature, hematogenous spread of *Klebsiella* from a distant skin site causing purulent pericardial effusion has not been described.

**CASE REPORT**

A 42 years old male, who is a known diabetic and alcoholic presented to emergency room with complaints of pain in right foot and pus discharge of 5 days duration which occurred after he sustained a minor leg trauma. He was diagnosed with diabetes 1 year back and was non compliant to treatment. Diagnosis of diabetic foot was made and debridement was done, pus cultures were sent. Patient was started on injection clindamycin and

injection vancomycin as per hospital protocol. On day 2 of admission, he started complaining of chest pain and dyspnea for which chest X-ray was done which was suggestive of pericardial effusion which was confirmed on CT Chest (Figure-1). Transthoracic echocardiography (TTE) revealed a 25-mm effusion at the posterior wall in diastole. Pericardial fluid aspiration was done and ~400 ml purulent fluid was aspirated (figure-2) and sent for microbiological evaluation. Pus culture from diabetic foot and culture of pericardial fluid revealed growth of *Klebsiella pneumoniae*. Inj piperacillin tazobactam was added based on sensitivity spectrum.



**Figure 1: CECT Chest suggestive of pericardial effusion (Left image, Orange arrow); TTE showing of effusion of 25mm (Right image, Green arrows).**



**Figure 2: Pus aspirated from pericardial cavity (left image) and diabetic foot ulcer. (Right image).**

Pericardial effusion was aspirated regularly and daily output decreased from ~ 400 ml/ day to ~ 180 ml/day on day 10. However; patient did not improve and injection meropenem was added based on repeat culture sensitivity. In view of prolonged pigtail catheterization and its known complication in form of pigtail fibrosis and constrictive pericarditis due to high protein content of pus, cardiothoracic consultation was taken; however due to active infection, intervention was deferred. Patient's condition worsened owing to underlying sepsis and patient succumbed to the illness.

## DISCUSSION

Purulent pericarditis is a critical disease and almost invariably develops in context of a severe infectious disease. Purulent pericarditis is defined as a localized infection of the pericardial space characterized by gross pus in the pericardium or microscopic purulence (>20 leukocytes per oil immersion field). Local extension of pneumonia is the most common source, followed by subphrenic abscess and mediastinitis due to downward propagation of a mouth abscess. Haematogenous spread following sepsis has rarely been reported. Wide variety of bacterial organisms have been reported as causative agents but most commonly isolated organisms are gram-positive cocci namely *streptococcus* and *staphylococcus* species, although some reports suggest increased incidence of gram-negative organisms.<sup>[5]</sup> Clinical suspicion should be high as most patients are usually identified only after hemodynamic instability sets in.

General physical examination suggestive of raised JVP with demonstration of Kussmaul's sign (paradoxical rise in JVP during inspiration), muffled heart sounds and low voltage ECG complexes may warrant further confirmatory investigations like Echocardiography.

Empirical antibiotics should be given including coverage for both gram positive and gram negative bacterial pathogens followed by pathogen directed therapy after pathogen identification. Duration of therapy must be individualized but most studies recommend a 4 week treatment regimen which can be adjusted depending upon resolution of fever, adequacy of drainage and antimicrobial susceptibility.

Pericardiocentesis should be done in cases that develop pericardial tamponade; antimicrobial isolation and antibiotic susceptibility should be tested. Purulent pericardial effusion can be complicated by constrictive pericarditis in as many as 3.5% of cases and pericardiectomy should be considered early in these patients. Intrapericardial fibrinolysis has been proposed as a less invasive approach than surgery however complete eradication of infection is not achieved by fibrinolysis. Role of steroids to prevent pericarditis has not been described and further studies needs to be done for any recommendations.

Despite timely recognition and treatment, reported mortality rates are between 20-30% which may be as

high as 70% in unidentified cases. Early recognition and timely intervention is of paramount importance for good prognosis.

### CONCLUSION

Clinical examination and radiological investigations can be used to make a diagnosis of pericardial effusion. Albeit rare, purulent pericardial effusion should be kept as a differential in a setting of infection. Timely diagnosis and treatment can decrease the associated mortality and morbidity. Pericardial drainage is the treatment of choice as in any pus collection in body.<sup>[4]</sup> Small effusions in the absence of tamponade may be conservatively managed initially, but close monitoring of the size of effusion by serial echocardiography is required. If persistent constrictive pericarditis has developed, delayed pericardiectomy should be considered.

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