ABSTRACT

Tunneled, cuffed central vein catheters (TCC) are an important mean of performing hemodialysis (HD). Infection is the commonest complication of these catheters. We describe a patient of chronic renal failure who suffered from Staphylococcus Aureus Bacteremia (SAB) due to the tunneled hemodialysis catheter. The bacteremia resulted in an isolated retrosternal abscess and multiple lung abscesses in this patient. The catheter was removed and patient was treated with broad spectrum antibiotics but he died despite optimal medical care. Although S. Aureus is a common cause of catheter related bacteremia but its manifestation as an isolated retrosternal abscess and multiple lung cavities due to tunneled hemodialysis catheter is a rare complication.

KEY WORDS: Tunneled Catheters, Hemodialysis, Staphylococcus Aureus Bacteremia, Abscess

INTRODUCTION

Tunneled, cuffed central vein catheters (TCC) are an important way of delivering hemodialysis (HD). Tunneling of the hemodialysis catheter prolongs its life, reduces the subsequent complications and cost by avoiding the repeated catheterization as compared to non-tunneled catheters. Despite its advantages, infection remains the commonest complication of tunneled hemodialysis catheters. Infection can be localized to just the exit site or can spread deeper into the tunnel (tunnelitis), or cause catheter-related bacteremia (CRB) systemically to trigger more serious consequences, such as sepsis, endocarditis, joint sepsis, vertebral abscess, discitis, or even mortality. Catheter related Bacteremia (CRB) associated with Tunneled, cuffed central vein catheters (TCC) occurs on an average of 3.13 episodes per 1000 catheter days. Serious metastatic infections may occur in about 30% (range 13-44%) of episodes of TCC associated bacteremia. We report a case in which patient who had a tunneled hemodialysis catheter in place, developed a retrosternal abscess and multiple lung abscesses because of staphylococcus aureus bacteremia.

CASE REPORT

A 52 year old male was admitted to our hospital with history of fever, chills, cough with sputum production and central chest pain for the last 2 weeks. The patient was a case of chronic renal failure secondary to Diabetes Mellitus and was on renal replacement therapy. The patient was having hemodialysis by a tunneled hemodialysis catheter that was passed by interventional nephrologist 3 months ago in this hospital. The Arterio-Venous Fistula (AVF) was also formed but it was not functional due to surgical complication. Physical examination showed a temperature of 39.9 C, blood pressure was 140/100 mmHg, pulse 120/minute and respiratory rate 22 per minute. Systemic examination was unremarkable. The exit site of tunneled dialysis catheter did not show any signs of infection or inflammation. The laboratory studies revealed hematocrit 38%, total leukocyte count 16×10^9/L (80% Neutrophils), and platelet count 155×10^9. Biochemical profile and result of a urinalysis was normal. A chest X-ray was performed that showed mediastinal widening and few cavitatory lesions for which a High Resolution CT (HRCT) scan of the chest was performed. Two sets of blood cultures were taken from peripheral veins and one set was taken from the dialysis catheter. Empirical antibiotic therapy with parenteral ampicillin/sulbactam (1.5 g/day) was initiated, based on a suspected diagnosis of catheter related bacteremia (CRB). All three sets were positive for methicillin resistant staphylococcus aureus (MRSA) and vancomycin was started. High Resolution CT of chest showed a focal soft tissue density lesion measuring 3.3×2 cm below the sternum starting from the level of aortic arch [Fig 1]. HRCT also showed multiple thick and thin walled cavities of various sizes scattered throughout both lung fields [Fig 2]. CT guided aspiration of the retrosternal mass was done and pus was aspirated. The culture of that pus grew S. aureus which was also methicillin resistant. Bronchoscopy with Broncho alveolar lavage (BAL) was performed as well but bronchial washings were negative for any organism. Despite treatment with Vancomycin, patient’s condition was deteriorating and his fever was not settling. The tunneled hemodialysis catheter was removed and a new temporary venous access was used for hemodialysis through the femoral vein. The patients general condition worsened and he died on 6th admission day despite optimal medical management. The death was directly attributable to catheter related bacteremia and metastatic infection caused by S.aureus which resulted in retrosternal and multiple lung abscesses.

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National Kidney Foundation Dialysis Outcomes Quality Initiative (NKF-DOQI) emphasized on insertion of arterio-venous fistula for the patients with chronic renal disease as early as diagnosed. In 65% of cases, temporary catheter is used. Two percent out of these cases will face complication during temporary catheterization. Although tunneling of the hemodialysis catheter has its advantages including short learning period for the nephrologist who is already well versed with placement of central venous catheters, availability of multiple sites for catheter insertion, immediate availability of an access providing high blood flow rates of 250-300 ml/minute, no hemodynamic consequences unlike AVF, its longevity and the low rates of catheter infection but infections still remain the commonest complication of tunneled catheter. The infection may be localized to the exit site, may be deep seated in the tunnel (tunnelitis) or it may spread in blood resulting in catheter related bacteremia (CRB). Staphylococcus aureus is one of the commonest organisms causing catheter related bacteremia (CRB). The frequency of complications from SAB ranges from 11% to 53%. These complications vary from endocarditis to metastatic foci to lungs, heart, CNS, bones, joints, and muscles.

We report this case because of two reasons; first, staphylococcal bacteremia resulting in retrosternal abscess is a rare complication. Milionis H et al reported a case of retrosternal abscess resulting from S.aureus bacteremia (SAB) in an immunocompetent patient. Another case reported by Julander I et al. was S.aureus bacteremia (SAB) resulting in endocarditis with retrosternal abscess in a drug addict. Secondly, although pulmonary involvement is recognized manifestation of S.aureus bacteremia, a case of multiple lung abscesses along with a retrosternal abscess resulting from tunneled catheter related bacteremia has never been reported in medical literature to our best knowledge.

Prophylaxis is important way of decreasing the risk of tunneled catheter related infections. The use of an antibiotic ointment at the exit site and the long-term usage of a dressing to cover the exit site are effective methods of decreasing the incidence of exit-site infection. Antibiotic and antimicrobial locking solutions show promise. A meta-analysis evaluated the incidence of catheter associated bacteremia in 29 trials with 2886 patients and 3005 catheters. Antimicrobial catheter locks significantly reduced the rates of catheter related infections. Aspirin has shown some potential anti-staphylococcal activity in hemodialysis patients and warrants further clinical evaluation. S.aureus bacteremia results in high morbidity and mortality. A combination of intensive antibiotic therapy and removing the source of infection are cornerstones of the management of S.aureus bacteremia (SAB). Empirical therapy is of critical importance in the treatment of SAB, because delayed usage of antibiotic treatment, even by only 45 h, has been shown to augment the risk of infection-related mortality and to increase the duration of hospitalization.

**CONCLUSION**

Staphylococcal bacteremia is a common completion of hemodialysis catheters. Its early recognition, preventive measures and empirical antibiotic therapy may reduce high morbidity and mortality associated with it and may also prevent its complications, one of which is multiple lung and retrosternal abscesses as described in this case report.

**REFERENCES**

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